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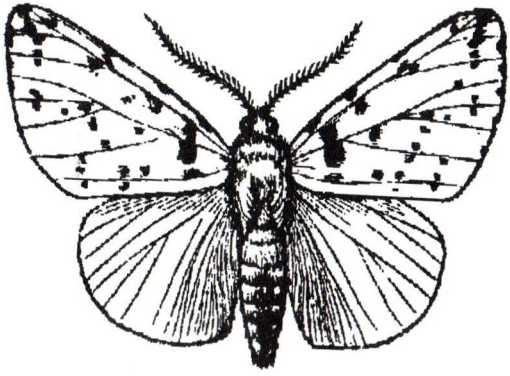
BULLETIN



ENTOMOLOGICAL SOCIETY OF CANADA
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BULLETIN
VOL 24(4) - December / décembre, 1992

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

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

Ball's Circle: a Merry Go 'Round in Systematics

A merry time was had by all at the G.E. Ball Retirement Symposium, held in Edmonton, Alberta, November 6-7, 1992. All of the members of the Entomology Department helped out in putting together this historic event (referred to, in some circles, as the "Ballorama"). They did an excellent job. Unfortunately, some people mistook this for an "Invitation Only" affair[1] ... and thus missed out on a jolly good time!

There were two dozen submitted papers. Many, but not all, were presented by ex-students from the G.E. Ball School[2] of Systematics. It is thus that we met Ball's very first students, Max W. McFadden and Ronald B. Madge. They broke with tradition and presented papers that had nothing to do with beetle systematics! McFadden asked us to consider the following: *Are we wasting our time? - human values and biological diversity* and Madge asked us *Who was Herschel?* We also met Ball's last student, Darren A. Pollock, who presented an excellent talk on the *Systematic position of Pilipalpinae (Coleoptera: Tenebrionoidea).* Quite appropriately, the spotlight was on the **Carabidae**; they were highlighted in presentations by Terry Erwin, Georges Perrault, James Liebherr, Peter Hammond, Jean-François Landry, and Jari Niemelä. **Weevils** were discussed by Tim Spanton, Bob Anderson, and Howard Frank; and **staphylinid beetles**, by Steve Ashe, and Henry Frania. Ross Bell spoke on *Omogylmmius* beetles.

Non-beetle talks included: Felix Sperling's "high-tech" approach to systematics; Robin Leech's "double talk"; Henri Goulet's *Tenthredo devia* (Hymenoptera) story; Rob Roughley's explorations into the world of the "genus"; and Edward Pike's amber arthropod fauna. There were even two fly talks - by Jeff Cumming and by Graham Griffiths. David Kavanaugh wrapped things up by likening George Ball, not to *Santa Claus*, but to the *Jolly Green Giant*!

In addition to the scientific presentations, some insight was gained into the private side of this distinguished man .... George Ball was roasted at every opportunity. For instance, do you know *when* George Ball started looking for beetles? Apparently, it was a long, long time ago. (A slide was shown of G.E. Ball in camouflage-patterned collecting gear being chased by dinosaurs!) In fact, candid photos of him were inserted into several of the otherwise serious talks. In the less formal sessions, tongues were loosened with hydroxylated beverages and secrets that had been kept from him *for over thirty years* were revealed! Everyone felt honoured to be there, to choke back the tears, and to share in the laughter.

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[1] an announcement (and general invitation) appeared in the ESC *Bulletin*, Vol. **24**(3):111-112

[2] I have chosen the more formal term, *school*, to describe Ball's influence. During the symposium there were also some less formal terms used. For example, in his opening remarks, I think John Spence was suggesting that we should think of George Ball as *Santa Claus*, of his laboratory as a *Northern Workshop*, and of his graduate students as *elves* ... working merrily at their benches, tap-tap-tapping at genitalia, glue-glue-glueing legs and elytra on bodies, etc.

Fiona F. Hunter

The deadline for submissions to be included in the next issue (Vol. **25**(1)) is **February 1, 1993**

La date limite pour recevoir vos contributions pour le prochain numéro (Vol. **25**(1)) est le **1 février 1993**

SOCIETY BUSINESS / AFFAIRES DE LA SOCIÉTÉ

President's Address

presented at Annual General Meeting, Saskatoon
29 September 1992

My address to you today is principally a "state of the Society" address. It serves to bring you up to date with the business of the Society over the past year and to predict some of the problems, as well as the progress, that lie ahead of us. In looking over the annual addresses of the last two presidents, I notice that some things do not appear to change. For instance, and I quote, "the book on *Diseases and Pests of Vegetable Crops in Canada* is almost complete and should be ready for publishing early in the new year". For 1991 and 1992, substitute 1993! Similarly the list of *Insect Common Names* "will be published in the near future" - and the same holds true today. However, this is very naughty of me since it trivializes the tremendous amount of work by a few individuals, working on our behalf, who put the finishing touches and make the final decisions over the myriad of details necessary to bring such projects to completion.

Some things, however, do change and have changed. The last two presidents have been able to stand here and report that the Society is in a sound financial state. But not this year. We suffered a deficit of $52,600 last year, and are predicting a further shortfall of $48,000 this year. To continue like this, of course, can only lead to bankruptcy. The board has identified our publications as one of the major sources of this drain on our finances. It has, therefore, asked the Finance Committee in cooperation with the Publications Committee to examine ways in which we can redress this situation. Their mandate will be quite comprehensive and will allow them to examine a wide range of issues, such as:

(1) explore offshore printing
(2) increase page charges, and the possible effects this may have on membership as well as submissions to *Can. Ent.* and the *Memoirs*.
(3) increase reprint charges
(4) apply for an NSERC publications grant
(5) explore costs and feasibility of publishing the *Memoirs* and/or *Can. Ent.* on CD ROM or 3.5" diskette
(6) change format of *Can. Ent.* e.g.., page size, two column pages, smaller type, etc.
(7) review the printers
(8) encourage the submission of camera-ready copy, etc.

A report should be ready for discussion at the next AGM.

Next year's AGM is likely to have a heavy agenda. In addition to the consideration of our financial position, we will be asked to vote on whether or not we continue our membership in the CFBS. You will

recall that the 3-year trial period ends next year and so will the ESC subsidy of CFBS dues for our membership.

Thus there are certainly some financial considerations surrounding this decision. In preparation for this debate, the Board has asked the Executive Council to take the following initiatives:

(1) a "cost/benefit" analysis of CFBS membership to be prepared for publication in the *Bulletin* - the MARCH 1993 issue
(2) the preferences of all members will be canvassed via a mail questionnaire or ballot - details to be determined
(3) the E.C. will invite comments from individual members about the roles and value of the CFBS to the ESC. A notice to this effect will appear in the *Bulletin*.

The ultimate goal of this exercise is to prepare us to come to the next AGM to debate this very important issue - one that may have a profound effect on the future of our society - and vote from the strength of informed opinion.

The Society has been active on several fronts this year, and these activities will be reported later in the *Bulletin* under Committee Reports. Let me return to two points, however, the DPVCC book and the list of Insect Common Names. The BOOK (as it is now referred to) has a revised schedule. The English version will run to 8,000 copies and will be published in January/February 1993. There will be 3,000 copies of the French version, which is presently being translated by Christine Thériault. A Marketing Committee Report by co-chairs Lloyd Dosdall (ESC) and Marilyn Dykstra (CPS) has been tabled. The list of Insect Common Names is not yet perfect (according to Elspeth Belton and Doug Eidt), but the Board has instructed Elspeth and Doug to produce the list as it now stands, and to look into the possibility of making it available on computer disc.

Other projects which are reaching fruition this year are two "green papers" about to be published as inserts in the *Bulletin*: (1) "Insect Transmission of Plant Diseases" by Gilles Boiteau and his committee, and (2) "Pest Management Policy" by Linda Gilkeson and her committee. This reminds me that the bulk of the work business of the Society is carried out by our various committees, and I would like to take this opportunity to thank all the members and chairs of the Standing, Continuing and Ad Hoc Committees. Although it is unfair of me to pick out individuals, I would like to give special thanks to the Executive Council for all their support (John, Paul, George and Ringo), to Lloyd Dosdall who is chair of the Publications Committee and co-chair of the Marketing Committee (a duty now taken over by John Laing), to Gary Gibson in Finance, and Doug Eidt for the LIST, to our editors, Al Ewen, Valerie Behan-Pelletier and Fiona Hunter, who maintain the excellence of our publications, and to last but not least, Bob Foottit and Rick West who <u>really</u> keep the Society running so smoothly.

Finally, I would like to thank you for electing me to this august position as President of the Entomological Society of Canada. I have learned a great deal on the job about the breadth of entomological endeavours and activities across the country and have been impressed with the amount of fine work going on in entomology in Canada today. It has been hard work at times, but it has also been fun! It has been an honour to serve you.

Richard A. Ring
President

Joint Meeting of the Entomological Societies of Ontario and Canada

SECOND NOTICE

26-29 September 1993 in Sault Ste Marie, Ontario

CONTACT: Dr. J. Turgeon, Forestry Canada, FPMI, P.O. Box 490,
Sault Ste Marie, Ontario, P6A 5M7 Tel. (705) 949-9461 Fax. (705) 759-5700

Réunion conjointe des Sociétés d'entomologie de l'Ontario et du Canada

26-29 septembre 1993 à Sault Ste Marie, Ontario

CONTACTER: Dr. J. Turgeon, Forêts Canada, IRRF, C.P. 490,
Sault Ste Marie, Ontario, P6A 5M7 Tel. (705) 949-9461 Fax. (705) 759-5700

Call for Nominations

Nominations for Second Vice President and Director-at-Large must be signed by three members in good standing and received by **30 April 1993** by the Secretary:

Nominations pour Deuxième Vice Président et Directeur doivent être signée par trois membres de la Société et envoyée avant le **30 avril 1993** au secrétaire:

Dr. Rick West
Forestry Canada, Newfoundland and Labrador Region
P.O. Box 6028
St. John's, Newfoundland A1C 5X8
Fax 709-772-2576
email address: rwest@vax1.nefc.forestry.ca

Call for Nominations - Honorary Membership

Nominations are invited for two Honorary Memberships in the Entomological Society of Canada. Honorary Members may be active members or former active members of the Society who have made outstanding contributions to the advancement of entomology.

Nominations must be signed by at least five active members of the Society and are then reviewed by the Membership Committee, who will select two names to be placed on the ballot. Nominations should include a brief biography of the candidate and a statement of her/his contributions to the advancement of entomology. Nominations should be received by the Chairman of the Membership Committee by **January 31 1993**. They should be sent in an envelope marked "Confidential" to the following address:

Dr. A.S. McClay
ESC Membership Committee
Alberta Environmental Centre, Bag 4000
Vegreville, Alberta T9C 1T4

Notice of Executive Council Meeting

The mid-term meeting of the Executive Council will meet at the Entomological Society of Canada Office in Ottawa in April 1993. Matters for consideration at this meeting should be sent to the Secretary at the address below:

Dr. Rick West
Forestry Canada, Newfoundland and Labrador Region
P.O. Box 6028
St. John's, Newfoundland A1C 5X8
Fax 709-772-2576
email address: rwest@vax1.nefc.forestry.ca

Committee Chairs for 1993

Standing Committees/Comités permanents

Nominations
R.A. Ring
CFBS Representative
TBA
Elections
T.D. Galloway
Fellowships/Compagnons
J.A. Shemanchuk

Continuing Committees/Comités

Achievement Awards/Pris d'excellence
L. Safranyik
Annual Meeting/Réunion annuelle
1993 - Sault Ste. Marie - J. Turgeon
1994 - Winnipeg - D.P. Dixon
1995 - British Columbia - R.A. Ring
Bilingualism/Bilinguisme
TBA
Bylaws, Rules & Regulations/Règlements
D. Quiring
Endangered Species/Espèces menacées
TBA
Finance
G. Gibson
Heritage/Héritage
P.W. Riegert
Insect Common Names/Noms communs d'Insectes et Élevages
E.M. Belton & D.C. Eidt
Membership/Adhésion
A.S. McClay
Public Education/Éducation publique
I.S. Otvos
Publications
L.M. Dosdall
Scholarships/Bourses d'étude
P. Fields
Research-Travel Grants/Octrois pour la Recherche-Déplacements
G. Boivin
Science Policy/Politique scientifique
G.H. Gerber
Student Affairs/Les affaires d'étudiants
K. MacKenzie

Ad Hoc Committees/Comités *Ad Hoc*

Diseases & Insects of Vegetables/Maladies et Insectes des Légumes
J.A. Garland
Headquarters
J. Cumming
Marketing Committee
J.D. Shorthouse
Systematics Enhancement Committee
S.A. Marshall

Treasurer's Report

The Society finished the year 1991 with a financial deficit due in large part to increased costs related to publishing (production, printing, mailing). I met with the Society's clerk (Sandy Devine), managing editor (Barb Patterson) and the chair of the Finance Committee (Gary Gibson) in order to find ways of bringing in-line the publications-related costs and the Society's publication-related revenues. These recommendations are in the Finance Committee report and action will be taken by the Board.

We are still faced with impending costs for the production of the book on the *Diseases and Insects of Vegetable Crops in Canada*. With some luck the book will sell quickly and the bills will come when our current income is large!

Other segments of the Society finances are strong. The Scholarship Fund continues to grow. At present our investment funds are in good shape. Most groups of bonds are for relatively long terms and have relatively high rates of interest. However, if we have to cash in bonds due to cash flow problems or expiry of the investment term, we will be facing considerably lower interest rates.

The headquarters operations have experienced some "ups and downs" this year. There have been few maintenance problems and we have kept renovations to a minimum until we solve the deficit problems. Our renter defaulted on some monthly rent payments; I have just obtained agreement from another party to take over the lease until it expires in January, thus ensuring that the Society receives some income from the headquarters operation.

Once again, it has been an interesting and pleasant experience serving as Treasurer. I would like to extend my sincere gratitude to Sandy Devine and Gary Gibson for their efforts and support.

Robert Foottit
Treasurer

Science Policy Committee

No contacts were made, nor lobbying conducted for increased R.& D. funding for entomologists; it was considered a waste of time during the current economic recession. Selected members were involved in the preparation, establishment, and expansion of legislation pertaining to the formulations of regulations controlling the use of non-insect biocontrol agents; "BioMal" was registered for use. Further monitoring of significant future aspects of bio-control policies is being maintained.

P.W. Riegert

Heritage Committee

The book: *Entomologists of British Columbia* was completed, printed, and distributed to members. Five boxes of archival material were deposited with the National Archives of Canada (NAC) in Ottawa. A 17-page cataloged list of E.S.C. holdings in the NAC has been completed and filed with the Secretary of the Society.

P.W. Riegert

Publications Committee Report

Members of the Publications Committee (PC) are: R.S. Anderson, J.T. Arnason, L.M. Dosdall, P.G. Kevan, T. Sahota, and S. Smith. V.M. Behan-Pelletier (Scientific Editor, *Memoirs*), A.B. Ewen (Scientific Editor, *The Canadian Entomologist*), F. Hunter (*Bulletin* Editor), B. Patterson (Managing Editor), and R. Ring (President) are *ex officio* members.

The PC recommended implementation of two changes to the "Instructions to Authors" for *The Canadian Entomologist* and the *Memoirs of the Entomological Society of Canada*. The first change proposed adding a statement urging authors to place descriptions of new taxa in proper context, and to provide a key or a modified key where possible. The second change proposed modifying the instructions so authors would be required to have references written out in full rather than abbreviated. Both changes were approved and published in the "Instructions to Authors" in the January/February issue of *The Canadian Entomologist*.

In collaboration with H.V. Danks and members of the Canadian Phytopathological Society, the PC chair and members P.G. Kevan and S.M. Smith prepared a marketing strategy document for "Diseases and Pests of Vegetable Crops in Canada". The document provided the Executive Councils of the ESC and CPS with a series of options for determining numbers of English and French copies of the book to be printed, and options for assessing advertising expenditures based on numbers of copies printed. Recommendations were made regarding purchase price discounts, target groups for an advertising campaign, the production and marketing of slide sets, and various other details pertaining to marketing the book.

The Executive Council directed the PC and Finance Committee to set higher page charges for *The Canadian Entomologist* and the *Memoirs* for 1993, to increase reprint charges in 1993, and to increase subscription charges for the *Memoirs* in 1994. The PC is currently evaluating recommendations of the Finance Committee, with a view to reducing publication costs for the Society's journals.

One application for page-charge waiver was received and granted pending acceptance of the paper through the scientific review process.

Twenty-five books were received for review. Five book notices were prepared, and reviews of several books were received and published in the *Bulletin*.

L.M. Dosdall

Finance Committee Report, 1992

The Treasurer and Finance Committee expressed concern over trends in Societal finances to the Executive Council at its midterm meeting in Ottawa, April 21, 1992. The following were noted at the time:

(1) Societal investment capital, which is used to offset annual operating losses declined 33% from $370,000 in 1988 to $245,000 in 1991.

(2) Societal expenditures exceeded income by $84,900 in 1991, resulting in a deficit of $52,625 ($16,400 more than budgeted).

(3) The budgeted deficit for 1992 is $47,900 (excluding expenses related to publication

of *Diseases and Insect Pests of Vegetable Crops in Canada* and interest from investment capital).

The Executive was warned that annual deficits could not continue at current levels without rapidly depleting resources and threatening future activities. The Finance Committee made six recommendations to the Executive and urged it to find other methods of reducing expenses. As a result, the Executive Council instructed the Finance and Publications Committees to recommend higher page charges for *The Canadian Entomologist* and the *Memoirs* in 1993, increased reprint charges in 1993, and increased subscription charges for *Memoirs* in 1994. It also instructed the Finance Committee, Treasurer, and Managing Editor to provide estimates of cost savings related to electronic editing.

Rates for author reprints have not changed since 1983. Current page charges for both *The Canadian Entomologist* and the *Memoirs* are $25. Publication costs for *The Canadian Entomologist* are $55/page. Production costs for *Memoirs* vary based on the length of the publication, but the average cost for the last five *Memoirs* was $71/page. This cost to charge differential resulted in a Societal loss of $30/published page for *The Canadian Entomologist* and $46/page for the *Memoirs*. The Finance Committee recommended that:

(1) Page charges for *The Canadian Entomologist* be established at $30.00 effective 1993. This would reduce losses to $25/page and likely increase revenue about $6,000 (based on an estimated 1200 published pages).
(2) Page charges for the *Memoirs* be established at $45.00 effective 1993. This would reduce losses to an average of $26/page and likely increase revenue about $14,000 (based on an estimated 700 published pages).
(3) The *Memoirs* series be reserved for publications of more than 100 printed pages in order to avoid proportionally higher production costs for smaller publications.
(4) Rates for author reprints be increased 10% effective 1993. This would increase revenue about $1,500 (based on sales from previous years).

The recommended page charge schedule would still result in a substantial loss to the Society, but would equalize the loss per page between *The Canadian Entomologist* and the *Memoirs*. Though the recommended increases are significant, charges remain favourable against similar journals in North America [*Annals of the Entomological Society of America* -- $(US)60/page for members and $(US)75/page for nonmembers].

The Treasurer submitted a budget projecting an operating deficit of $60,725 for 1993. After discussion with the Treasurer, the Finance Committee recommended that this not be approved by the Executive unless the recommendations to increase publication revenues were also adopted. The recommendations would increase revenue about $21,500 and reduce the projected net 1993 deficit to $14,225. This represents a balanced budget excluding the Societal subsidy of $17,000 for membership in the Canadian Federation of Biological Societies (CFBS).

The Finance Committee expressed continued deep concern about potential impact of CFBS affiliation on future membership and finances. The coming year, 1993, is the final year that the Society is obliged to subsidize members' affiliation. If CFBS membership is maintained, the Society can not continue to subsidize members unless revenues are increased proportionally by some means.

Gary Gibson
Chair, Finance Committee

1992 Annual Meeting Committee Report

The Committee met on several occasions during the past 2 years. The program was shown to President Ring in January 1992 and the feedback was enthusiastic. Announcements of the meeting were published in the *World Meetings Database* and the March Issue of the *ESA Newsletter*. Formal announcements appeared in the March 1992 and June 1992 issues of the ESC *Bulletin*. A total of 181 people registered and about 100 contributions (symposium, workshops, scientific communications and posters) were made. The Gold Medal award was presented to Dr. Glenn Wiggins and the Hewitt award was presented to Dr. Dan Johnson. Steve Schofield from Trent University won the 'President's Prize' student paper competition. Despite tough economic times the generosity of the following sponsors: Saskatchewan Agriculture and Food, National Sciences and Engineering Research Council, University of Saskatchewan, Dow Elanco, Hoechst, College of Agriculture, University of Saskatchewan, Chemagro, Chipman, Lakewood Systems, Gufstason-Uniroyal, Ag West Biotech, SECAN, United Agri Products, Ciba Geigy, Nikon Canada, Agriculture Canada and Saskatchewan Wheat Pool helped to make the meeting a success. Many people helped organize the meeting. Special thanks to Dr. J.J. Soroka for her extraordinary efforts and to the grant employees at the Saskatoon Research Station whose willing help made the meeting that much better!

P. Mason

Membership Committee Report

A membership list has been produced and mailed out to all members. Total membership as of December 1991 was 678 members including 84 student members, 77 emeritus members and 8 honorary members. Letters were sent in July to all members who had not renewed for 1992. A total of 17 have since renewed, 14 resigned, 3 have moved without forwarding addresses, and 1 transferred to emeritus status. This leaves a total of 57 who have not responded. The large number of non-respondents is a concern and further steps will be taken to contact them. The Society's membership in good standing is currently estimated at 605.

A letter is being sent to University heads of departments requesting the names of graduate students working on entomology-related projects. These names will be used to promote student membership in the Society.

There are two vacancies for Honorary Membership in the Society. A call for nominations appeared in the September *Bulletin* (Vol. **24**(3):105). An application form for membership will also appear in all issues of the *Bulletin* starting with the September issue.

There have been questions raised concerning the rights and status of emeritus members, particularly as concerns Society publications. The Society's By-Laws and Rules are not clear on this as the term "member in good standing" is nowhere defined. Article IV-5 of the By-Laws, however, states that Special Members (i.e., Fellows, Honorary Members and Emeritus Members) who retain Active Membership shall have all the privileges of Active Membership, implying that those who do not retain active membership, do not have those privileges. Active members are those who pay dues. The Society's rules as they stand thus imply that we are not obliged to provide any privileges to non-dues-paying members. As this is at variance with current practice, the Standing Rules should be revised to clarify the situation.

A.S. McClay
Chair, Membership Committee

Report of the Ad Hoc Committee on Integrated Pest Management Policy

Over the last year, a new committee chair was appointed and two Committee members were added (Bob Vernon and David Levin). The original draft document was revised and expanded to include recommendations for an ESC policy on integrated pest management. This was sent out for review to the four members of the committee and to twelve other reviewers across the country. A second draft incorporating their suggestions and comments was submitted to the committee for final editing. The completed document was submitted to the ESC Governing Board for consideration at the September meetings.

Linda A. Gilkeson
Committee Chair

Annual Report of the Public Education Committee

Vince Nealis and Jean Turgeon continued as co-chairs of the Public Education Committee for 1991-1992. The Public Education Committee dispursed $400.00 in funds to regional societies:

$200.00 Entomological Society of Manitoba
$200.00 Société d'Entomologie du Quebec

A request for $500.00 was received from the Entomological Society of British Columbia to match funds made available by that regional society for public education. This committee, however, does not have the authority to approve amounts over $200.00 so the request was forwarded to the president, R. Ring. The Public Education Committee recommended the amount requested by the ESBC.

The brochures "Entomology in Canada" and "L'Entomologie au Canada" were completed at a total cost of $2161.22. See the report in the summer issue of the *Bulletin*.

A memo from the CFBS Public Education Committee was distributed to regional directors in May, 1992. The memo was soliciting members' involvement in a Roster of Scientists. Respondents would receive the booklet "Communicate with Power: Encountering the Media" by Barry McLoughlin Associates and their names added to the roster as potential media contacts for science news. The May roster included ESC members Jeremy McNeil, Ian Smith, and Roger Downer.

Vince Nealis
Co-chair, Public Education Committee

1992 Achievement Awards Committee

The Gold Medal Award for 1992 has been awarded to Dr. Glenn B. Wiggins of the Royal Ontario Museum, Toronto. Dr. Daniel L. Johnson, Agriculture Research Station, Lethbridge, has been awarded the C. Gordon Hewitt Award for 1992. The selections were made by the 1992 Achievement Awards Committee; the candidates were approved by the Governing Board.

George H. Gerber
Chair, 1992 Achievement Awards Committee

ESC & CPS Book Project - Annual Report

This project, which began in 1986, will conclude in 1993 with the publication of *The Diseases and Pests of Vegetable Crops in Canada*, an illustrated compendium with sewn binding, a water-resistant cover, an optional hard cover, and available in both English and French.
Noteworthy events during the year include:

(1) Drs R.J. Howard and J.A. Garland, chairs of the respective CPS and ESC steering committees, were confirmed as co-editors and Dr W.L. Seaman (CPS) agreed to act as co-editor managing final changes and the colour work.

(2) Dr R.A. Ring, ESC President, formally thanked Drs G. Boivin, R.P. Jaques, L.S. Thompson, W.J. Turnock and R.S. Vernon for acting since 1986 on the ESC steering committee, which now has largely fulfilled its function.

(3) M.O.M. Printing Ltd., Ottawa, was selected as the printer, which will sub-contract the colour work to Hadwen Graphics, also of Ottawa. Members of the ESC council met with M.O.M. and Hadwen Graphics while in Ottawa in April. Since then, there has been a business meeting with M.O.M. Printing and Hadwen Graphics (see item 7).

(4) A comprehensive marketing strategy was developed. The ESC representative on the CPS book marketing sub-committee was Dr Lloyd Dosdall; latterly it has been Dr John Laing.

(5) A poster, prepared by Marilyn Dykrtra (CPS) assisted by WLS and JAG, was displayed at meetings in Charlottetown (CPS) and Oregon (APS). It and an updated promotional flier were brought to the ESC annual meeting in Saskatoon by Dr John Laing.

(6) The French translation was contracted to Mme Christine Thériault, Quebec City, who started immediately. Drs Claude Richard (CPS) and Guy Boivin (ESC) agreed to edit the French translation, Drs Luc Couture (CPS) and Jeremy McNeil assisting.

(7) The co-editors (RJH, JAG & WLS) held a conference call on 27 July to discuss matters arising from a meeting between WLH, JAG and Dr H. Harding (CPS President) with M.O.M. Printing and Hawden Graphics in Ottawa on 23 July; other items of business included manuscript revision, format, illustrations, paper, marketing, timetable for the English and French versions and progress reports to both societies.

(8) Archival material was mailed by JAG to the ESC Office. More will follow.

(9) A revised book preparation schedule was circulated on 5 August.

To conclude, the book is progressing well and, despite this late date, new material is being added to take account of new pest and disease situations: to include the pepper weevil as a foreign pest of concern, for instance, after a recent incident in a greenhouse pepper crop in Langley, British Columbia. There is still a lot of work to do but it is also a pleasure to note that more people in both societies are sharing the load in what promises to be a fine publication.

J.A. Garland
Chair, ESC Steering Committee

Scholarship Committee Report

There were five applications this year compared to 17 in 1991. Two new committee members were appointed in 1991; they are Paul Fields from the Agriculture Canada Research Station in Winnipeg and Jim Corrigan from the Department of Environmental Biology, University of Guelph.

The two successful candidates in 1992 were Ms. Maya Louise Evenden and Mr. Martin Hardy. Maya obtained her Bachelor's degree in Biology in 1991 at the University of Victoria, took a French immersion course at Laval University in 1991-1992 and has enrolled in a Master's program at Simon Fraser University under the supervision of Dr. John Borden. The topic of her research is the use of pheromone traps for monitoring populations of western hemlock looper. Maya received her award at the Annual Meeting of the Entomological Society of British Columbia at Simon Fraser University on October 23rd.

Martin graduated with a Bachelor's degree in Biology from Laval University in 1991 and enrolled in a Master's program at the same university in 1991. His co-supervisors are Dr. Jeremy McNeil and Dr. Johanne Delisle. The subject of his thesis is the effect of larval food quality on the reproductive biology of spruce budworm and oblique banded leafroller. Martin's research is being conducted at the Forestry Canada - Quebec Region laboratory. Martin received his award at the banquet during the Joint Meeting of the Entomological Society of Canada and the Entomological Society of Saskatchewan in Saskatoon on September 29th.

I have now chaired the Scholarship Committee for 3 years and am stepping down. Paul Fields has been appointed as the new chairman. One of his first tasks will be to establish a new Scholarship in honour of the late Dr. Keith Kevan. Details will be published in the next issue of the *Bulletin*.

I have really enjoyed my term as Chairman of the Scholarship Committee and thank the ESC for giving me the opportunity to serve in this capacity.

John C. Cunningham
Chairman, Scholarship Committee

Report of the Scientific Editor - *Memoirs*

As of September four manuscripts have been submitted to the *Memoirs* for publication in 1992 including the Symposium from the ESC Meeting in Banff 1990, edited by G.E. Ball and H.V. Danks. Of these manuscripts, two are in press, and two are in review.

Four *Memoirs* will appear in 1992 (nos. 161-164), of which the first two, totalling 159 pages are already published. There is a possibility that a fifth *Memoir* will be published this year - hopefully! The number of *Memoirs* for 1992 is approximately the average number published per year in the past, and suggests that the seven published in 1991 were not the start of a trend.

Again my thanks to Al Ewen for his help and advice this year. Thanks also to the anonymous reviewers, who have given their time and expertise, and finally, and especially, thanks to Barbara Patterson and Sandy Devine for their help, patience, and cheerfulness.

Valerie Behan-Pelletier

Student Affairs Committee - Annual Report 1992

A call for volunteers was published in the December and March issues of the *Bulletin*, and a letter and short questionnaire was sent out to student members in mid-June. The questionnaire was also printed in the September *Bulletin*. In addition to Elizabeth Tomlin of Simon Fraser University, three more students, Troy Danyk of Simon Fraser University, David Bergvinson of the University of Ottawa, and Richard Gagne of the University of Missouri, volunteered to serve on the committee.

The objective of the questionnaire was to solicit student input and to aid in topic choice for a potential job skills symposium. Of the 61 student members sent questionnaires in mid June, 10 responded. Results follow:

1. I would attend a job skills symposium on: (choose best two)

How to write scientific papers and grants	8
Seminars and other presentations	5
Preparations for a career in entomology	4
Entomology in teaching	3
Other (choosing a thesis project)	1

Comments: grant writing would be very useful, just on writing grants and research proposals, one speaker to talk about the review process

2. Would you qualify for the Travel Grant Award offered by ESC?
No - 1 , Yes - 3, Don't Know - 5

Comments: travel grants to enable students to present at meetings

3. Other Comments/Suggestions: coordination of room sharing for individuals attending ESC, good idea to establish lines of communication between students at their various institutes of study, membership forms need to be more available

The Student Affairs Committee plans to hold a job skills symposium at the 1993 Annual General Meeting. The topic will be "Writing Grants and Research Proposals". Suggestions of potential speakers would be appreciated.

Two outstanding issues remain from last year's meeting. First, the creation of a student membership at a reduced rate (without journal) is strongly recommended. This may help to increase student membership in ESC which, incidentally, has dropped over the last few years from 79 in 1990 to 61 this year. It is also recommended that application forms for ESC be more accessible. Perhaps, these could be published in the *Bulletin* on a routine basis. Second, methods of increasing the number and/or type of scholarships/awards available to students needs more investigation. I look forward to working with the Board on these important issues of interest to students.

Kenna MacKenzie
Chair, Student Affairs Committee

Report of the Scientific Editor - *The Canadian Entomologist*

EDITORIAL OFFICE - From 1 September 1991, through 31 August 1992, costs for services and supplies for the editorial office have been ca $6895 or $574 per month. This compared with ca $525 per month (1991), $594 (1990), $610 (1989), $480 (1988). The major expenses have been for word processing (ca $4016), postage and courier (ca $820), telephone (ca $1005), and equipment and supplies (ca $1045). Included under equipment are three items which can be considered as assets: postal scale ($40); 4-drawer file cabinet ($215); and a Canon PC-1 photocopier ($695).

PEOPLE - Dr. Jacqueline L. Robertson, until recently co-editor of the *Journal of Economic Entomology*, phoned me to ask if she could serve as an Associate Editor for us. She begins her appointment in October of this year and will help out with manuscripts in applied forest entomology and pesticide resistance and management.

MANUSCRIPTS - From 1 September 1991 through 31 August 1992, 120 manuscripts were received. Their disposition was:

In review - 18; In revision (A) - 27; Withdrawn (B) - 1; Accepted (C) - 53; Rejected (D) - 21

Rejection Rate (D+B)/(A+B+C+D) = 22%

About 78% (71 of 91) of the manuscripts submitted were returned to authors within 12 weeks of the submission date.

The decline in the number of manuscripts submitted continues the trend first noted last year, although it has not worsened. I notice the most dramatic declines are in the subject areas of applied agricultural entomology and applied forest entomology, and particularly among authors from universities. It has been suggested to me by two Associate Editors, independently, that many authors are now looking to European journals because those journals do not have page charges.

During 1992, I estimate that 1100-1200 pages will be published in *The Canadian Entomologist* (744 in the first four issues). In 1991, 1281 pages were published. One C.P. Alexander Fund Invitation paper has been published this year, one has been accepted for publication and will appear before year's end, and one is now in revision. Suggestions for authors/topics from the membership are welcomed.

ACTION REQUIRED FROM 1991 BOARD MEETING - none.

KUDOS - My sincere thanks go to the Associate Editors and Assistant Editors, all of whom serve the Society so well and without whose help our journals would not succeed. Thanks, too, to Lloyd Dosdall (Chair, Publications Committee) and President Ring for their counsel and support, and to the many scientists who gave freely of their time to review manuscripts. And last, but by no means least, Sandy Devine and Barbara Patterson continue their fine work for the Society. I am amazed at their patience in dealing with an often cantankerous editor.

Thank you for the privilege of serving as Scientific Editor. I and my Assistant Editors are willing to continue for another year, if that is your wish.

Al B. Ewen
Scientific Editor

Annual Report - Editor of the ESC *Bulletin*

The 1992 *Bulletin* has been much easier to put together than was the 1991 *Bulletin*! I had excellent help from two typists at Brandon University, Cathy-Jane Green and Betty Peloquin. The cost to the Society for typing (March and June issues only) was $190.00. After moving to Brock University on July 1st, I purchased my own *Scanman 256*® with Optical Character Recognition (OCR) capabilities. This means that most text sent to me via the regular mail can be scanned and incorporated into Pagemaker® (the Desktop Publishing Software) without re-typing. I have found, however, that this only works for letter-quality or laser-printed text. It is hopeless to scan dot matrix text and, unfortunately, faxed text is even worse! This is especially disappointing, because I still receive a lot of last-minute faxed items for the *Bulletin*. I still prefer submissions on diskette, of course. I can read 3½" IBM and 5¼" IBM diskettes (all types of wordprocessing files) and HIGH DENSITY 3½" Mac diskettes (preferably ASCII files).

I am indebted to Charles Vincent who cheerfully helps with the French translations - even on short notice! Lloyd Dosdall, Chair of the Publications Committee has been sending me Book Reviews on diskette. This has saved me a considerable amount of time since I no longer need to re-type the text nor do I need to proofread the text with a fine-tooth comb. I have been delighted by the Guest Editorials. On the whole, members are being very cooperative. In the March issue (**24(1)**: 8-12) I printed a brief prepared by Gilles Boiteau et al. by mistake. I did not realize that Gilles was still working on revisions for publication. My apologies.

Before moving to St. Catharines I sent out "Change of Address" notices to members of the Society who regularly submit items for the *Bulletin*. I also sent out a "Proposed Schedule of Submissions" and asked that each person check the accuracy of the schedule for her/his particular Committee, etc. It is not uncommon for a few tardy members to fax me items (often several pages in length!) up to 14 days after the "official" deadline. I have tried to accommodate such members, but then I start receiving complaints at the other end about the time it takes for members to receive the *Bulletin*. Please note that it currently takes 5-5½ weeks for the Printers to process the *Bulletin* (i.e., from the date I submit "camera-ready copy" to the date I receive my copy in the mail). I am investigating the feasibility of changing Printers to try to speed up this last leg of the publication process.

Fiona F. Hunter
Bulletin Editor

Report of the Bylaws, Rules and Regulations Committee

All changes to the standing rules and committee guidelines requested at the governing board and annual general meetings in Montreal have been carried out and are listed below.

1. The changes to Standing Rules I.2 (a) and IV (a), which were approved at the 40th annual general meeting and are listed in the December (1991) *Bulletin* have been carried out.

2. At the board meeting on Oct. 19, Quiring moved and McNeil seconded that the term 'calendar year' be defined more clearly in the Committee guidelines. We have consequently changed Rule a (2) to read "The Hewitt award is restricted to persons who are under 40 years of age as of Dec. 31 of the year in which the Award is both announced and awarded."

Dan Quiring
Guy Boivin

Elections Committee / Le Comite des elections

The committee was comprised of C.H. Craig, R.H. Elliot, and A.B. Ewen. The committee met on 15 July, 1992, at the Agriculture Canada Research Station, Saskatoon, Sask., and examined ballots for the 1992 election of officers. In total, 254 ballots were received. The successful candidates were:

Le comité a compris C.H. Craig, R.H. Elliot, et A.B. Ewen. Le Comité a tenu une réunion le 15 juillet 1992 à la Station de Recherche d'Agriculture Canada, à Saskatoon, Sask., ôu il a examiné les bulletins de scrutin pour l'élection des officiers pour 1992. Un total de 254 bulletins ont été reçu. Les candidats élus sont:

Second Vice-President/Le deuxième vice-président:	Les Safranyik
Directors-at-Large/Directeurs nationaux:	Hugh Danks & Sandy Smith
Fellowship Selection Committee/ Comité pour la sélection des compagnons de la Société:	Ed Becker & Doug Eidt

A.B. Ewen

Comité des bourses de voyage pour étudiants gradués - Rapport annuel 1992

Des avis concernant l'octroi de bourses de voyages pour étudiants gradués ont été publies dans les numéros de septembre et de décembre du *Bulletin* (**23**(**3**): 129-130; **23**(**4**): 213-214). Six demandes de bourses ont été reçues et les récipiendaires pour 1992 sont M. R.A. Anderson du Département d'Entomologie de l'Université du Manitoba et M. E.R. Lima du Département de Biologie de l'Université Laval. Le nom des gagnants a été publié dans le numéro de juin du *Bulletin* (**24**(**2**): 64). Le comité des bourses de voyage pour étudiants gradués était composé, en 1992, de:

Dr. G. Boivin (Président), Agriculture Canada, Saint-Jean-sur-Richelieu; Dr. D. Coderre, Université du Québec à Montréal, Montreal; Dr. S.A. Marshall, University of Guelph, Guelph; Dr. P. Martel, Agriculture Canada, Saint-Jean-sur-Richelieu; Dr. P.G. Mason, Agriculture Canada, Saskatoon; Dr. R.A. Ring (*ex officio*), University of Victoria, Victoria.

Guy Boivin

Insect Common Names and Cultures Committee - Annual Report

Publication of the common names list has been further delayed because it took longer to check some groups of scientific names than anticipated. We have heard, unofficially, that BRD are unable to go over the Coleoptera, Diptera or Lepidoptera names, although Dr. LeSage has kindly corrected the chrysomelid names. We are grateful to the systematists who corrected the names in most of the other orders and the pertinent changes have been made in the database.

About 100 names have been added to the database, some of which had got lost when the tapes of the Benoit list were converted to our computer system.

Around 1000 names have been marked for deletion - which means that they will be retained on the database but will not appear in, at least this version of, the new list.

Belton spent much of the summer correcting the database and producing lists of groups of names with specific words in them e.g. 'pine', 'gall', 'miner' and 'borer' etc. These were sent to about 20 specialists. Five of them have responded.

We have a choice of printing the list with some outdated taxonomic nomenclature now or of waiting an indeterminate period to produce one that is closer to perfection. We request a decision by the Board.

E.M. Belton & D.C. Eidt
CoChairs, ICNCC

Comité pour le Bilinguisme, Société d'entomologie du Canada, 1992

Le bilinguisme a progressé au sein de la Société d'entomologie du Canada en 1992. Le principal problème relevé en 1991, soit la traduction des résumé d'articles du *Canadian Entomologist* de l'anglais au français, a été résolu. En effet, la qualité des résumés publiés cette année était excellente. Le *Bulletin* a également reflété le niveau de bilinguisme. Par exemple, les annonces de la réunion de Saskatoon ont été complètement publiées dans les deux langues officielles. Quelques erreurs typographiques ont malheureusement été publié, ce qui démontre l'importance d'une révision minutieuse des épreuves. Fiona Hunter, éditeur du *Bulletin*, a gracieusement demandé des contributions au cours de l'année.

La SEC a démontré un engagement profond envers le bilinguisme en faisant traduire le livre sur les insectes de légumes.

Enfin, les régles permanentes de la SEC ont été traduites sous contrat. Elles sont maintenant disponibles sous forme imprimée et disquette (Word Perfect pour IBM) auprès du Secrétaire Rick West. Nous suggérons que les membres bilingues du Comité des réglements en assure la traduction sur une base annuelle.

C. Vincent (Président), J. Delisle, K. Pivnick
Comité du bilinguisme

Committee for bilingualism, Entomological Society of Canada, 1992

In 1992 bilingualism progressed in the Entomological Society of Canada. The main problem addressed in 1991, namely the translation of abstracts for *The Canadian Entomologist* into French, was solved. Indeed the quality of the translation of Abstracts published this year was excellent. The *Bulletin* also reflected the level of bilingualism. For instance, the Saskatoon meeting was fully advertized in both languages. Unfortunately, a few typos were published. Careful editing of final drafts are in order. *Bulletin* editor Fiona Hunter was keen to ask for input to render the *Bulletin* more bilingual.

The ESC showed a strong committment to bilingualism in having the book on Insects of Vegetables translated.

Finally the Standing Rules of the ESC were translated under contract. They are now available in both printed form and on diskette (Word Perfect for IBM). Copies were sent to Secretary Rick West. We suggest that bilingual members of the Guidelines Committee should update the document every year.

C. Vincent (Chair), J. Delisle, K. Pivnick
Bilingualism Committee

Endangered Species Committee Annual Report

Communication with the majority of the committee members was maintained until the start of the 1992 field season, and has just been re-started with the submission of the final report.

Communication with Christopher Shank (Chair, COSEWIC) has resulted in his writing that objections to the 1988 proposal to include invertebrates in the endangered species list have probably been removed by concerns about biodiversity. We have now a draft copy of the COSEWIC procedures as amended April 1992 to act as a foundation for developing a new proposal. Mr. Shank also included excerpts from the April 1992 meeting of the Biological Survey which outline two important initiatives in which we need to be involved:

(1) Development of a federal policy on endangered wildlife is mandated by the Green Plan for 1993. I have recently contacted Mr. Tim Lash regarding our involvement.
(2) Liaison between the Canadian Nature federation, the CWS and the Nature Conservancy of Canada will apparently create a fund for the study of invertebrates and plants.

The Nature Conservancy of Canada, Western Region is very interested in input from our members concerning parcels of land with special or unique habitat in western Canada. Suggestions can be passed to The Nature Conservancy of Canada, 707 - 8 Avenue S.W., Calgary, Alberta; Tel. 294-7064.

Members of the committee support the production of papers outlining the status of various habitats in each province, and the quality of protection afforded by different levels of preservation (National Parks, Provincial Parks, Municipal Parks, Natural areas, etc.) I anticipate the preparation of such works is under way according to the time resources of the members who have supported this initiative.

It is proposed that out-going chairpersons pass their files on to new chairpersons at their acceptance of the Chair. The new chairperson becomes responsible for keeping those files necessary for the ongoing efforts of the committee, and sending the remaining files to the office of the Society.

A paper data base of candidates for endangered species status is being prepared based on major review articles published in the last 20 years. Criteria for inclusion are rather ephemeral at this time, but include occurrence in rare habitat and number of known records. A copy of this document will be sent to the Society, one copy will be kept in the files of the Chairperson, and data on species of provincial and national concern will be sent to each member of the committee.

Proposed action for 1992-1993:
- draft a document requesting the inclusion of invertebrates for presentation to COSEWIC
- interact with CWS to establish what we can do to assist their efforts with federal legislation
- continue to refine the data base and send copies to groups which may find it useful
- prepare papers on the status of protection for different types of federal, provincial, and municipal designations and the habitats they protect.

T. Pike
Committee Chair

Annual Report of the Entomological Society of British Columbia

The 90th Annual Meeting of the Entomological Society of B.C. was held on September 22 and 23, 1991, at the Coast Lakeside Resort, Penticton, B.C. President Joan Cossentine gave the opening remarks and Richard Ring brought greetings from the Entomological Society of Canada. Sixteen papers were presented, with prizes for the student paper competition being awarded to Andrew Chow and Rob McGregor (PhD candidates from Simon Fraser University, Harold Madsen Awards) and J.P. Deland and Maydianne Andrade (Masters candidates from Simon Fraser University, James Grant Awards).

There are presently 110 active members in the Society. A new executive was named at the September, 1991 AGM, with Bob Vernon as incoming President and Regional Director to the ESC, Hilary Graham as Secretary-Treasurer, Terry Shore as Vice-president, and Dean Morewood and Tom Lowery as new ESBC directors. Imre Otvos continues in his second year as editor of *Boreus*, the ESBC newsletter. With Richard Ring as editor, the 88th volume of the Journal of the Entomological Society of British Columbia was issued in December, 1991, with 11 submitted papers. Under the supervision of Dave Raworth and Terry Shore, the ESBC library has been moved from the Vancouver Research Station to the Pacific Forestry Centre in Victoria B.C.

In a joint effort between ESC and ESBC, the *Entomologists of British Columbia* was published and distributed to contributing members. This work was expertly and concisely compiled by Paul Riegert, and will be a valuable document for B.C. entomologists for years to come. The ESBC wishes to thank the ESC and Paul Riegert for making this publication possible.

With matching financial assistance from the ESC, (for a combined total of $1000), the ESBC Public Education Committee funded a number of insect-oriented activities in 1991. The program funded elementary schools in Squamish and in west and North Vancouver, to purchase insect collection, preservation and rearing equipment, instructional materials and teaching aids. This year, the ESBC will again solicit entomological project proposals towards enhancing public education. Joan Cossentine, former president of the ESBC is presently the chairperson of this committee. The ESBC wishes to thank the ESC for their generous contributions to this worthwhile cause.

The 91th Annual Meeting of ESBC was held on October 23, 1992, at the Halpern Centre at Simon Fraser University and this year was held in conjunction with the third annual H.R. MacCarthy Pest Management Lecture. The invited Lecturer for this year was Dr. Stan Finch from Horticulture Research International, Wellesbourne, England. He presented a lecture entitled "Integrated Pest Management in Field Vegetable Crops - The Challenge Facing Research Scientists".

Robert S. Vernon
ESBC Regional Director to ESC

Annual Report of the Entomological Society of Alberta

The 39th Annual Meeting of the Society was held at the Lakeshore Inn, Waterton Lakes, October 3-5, 1991, and was attended by 61 members. The program featured a symposium entitled "Host Resistance - Mechanisms and Applications?", with a keynote address by Dr. Robert Lamb, of the Agriculture Canada Winnipeg Research Station.

At the business meeting, members discussed the possible production of a journal by the Society to replace *Quaestiones Entomologicae*. It was agreed that it was not necessary or feasible to proceed with this. The Society's *Insect Collector's Guide* is being updated.

The proceedings of the 38th Annual Meeting, held in Banff in 1990 in conjunction with the Entomological Society of Canada, are now available, and the proceedings of the 39th Annual Meeting are in preparation.

Continuing the tradition in recent years of holding "meetings in the mountains", the Society's 40th Annual Meeting will be held in Jasper, Alberta, October 15-17, 1992, at the Chateau Jasper Hotel. The keynote speaker will be Dr. Joe Elkinton of the University of Massachusetts, who will give an overview of his gypsy moth research program. The banquet speaker will be Dr. Jari Niemelä, visiting researcher at the University of Alberta, who will give a talk entitled "Entomology on the Top and Bottom of the World". The scientific program this year will include a poster session for the first time.

A.S. McClay
ESA Regional Director to ESC

Annual Report of the Entomological Society of Saskatchewan

The Society has 70 members in 1991-1992, an increase of 8 members in the last year. The Student and Amateur Encouragement Committee has been active, giving entomological presentations to school classrooms, agricultural and hobby shows, and other meetings. The booklet *Entomologists of Saskatchewan* by Paul Riegert has been published and distributed to members and other interested parties.

The 39th Annual Meeting of the Society was held in Saskatoon on November 1-2, 1991. There were six invited speakers for a symposium on Biological Control - Theory, Practices, and Problems. There were 12 submitted papers. The abstracts of the talks have been published in Volume 39 of the Society's Proceedings. At the meetings, Rick Martel of the University of Regina was presented with the best student paper award, as well as the A.R. Brooks Prize for excellence in academic achievement.

At the Spring, 1992 meeting "insect rights" were discussed and, as a result, an ad hoc committee was formed to develop a position paper addressing the issue of insects in research and education.

The Silver Spring Prairie Committee of the Saskatchewan Natural History Society presented a report to the ESS, asking for membership assistance in an insect survey of the Silver Spring Prairie, an area of native fescue grassland northwest of the Saskatoon Forestry Farm.

Juliana J. Soroka
ESS Regional Director to ESC

Annual Report of the Entomological Society of Manotoba

The 47th Annual Meeting of the Entomological Society of Manitoba was held on 7-8 November, 1991 in Winnipeg. The symposium, "Pest Management: Are There Alternatives?" was a success, and Drs. Gord Surgeoner, Sandy Smith and Mike Weiss were the out of town invited speakers. Dr. Paul Riegert spoke on behalf of the Entomological Society of Canada.

The 48th Annual Meeting of the Entomological Society of Manitoba will be held on 5-6 November, 1992 in Winnipeg. Dr. Tom Baker, from the University of California and Dr. Ralph Howard from USDA at Manhattan KS, will be the out of town invited speakers with the symposium focusing on chemical ecology.

The symposium on "Management of Postharvest Ecosystems: Current and Future Trends" held at the 1990 Annual Meeting of the Entomological Society of Manitoba was published in *Journal of Stored Product Research* Vol. **28**, no 2.

A committee to organize the Joint Annual Meeting of the Entomological Societies of Manitoba and Canada has been appointed with Dr. Don Dixon as General Chair, Dr. Paul Fields as Science Program Chair and Dr. Richard Westwood as Fundraising Chair. Hotels are being approached with tentative dates being 15-19 October 1994.

Other activities of the society include: publication of Volume 47 of the Proceedings with abstracts from the 1991 Annual Meeting and 1 scientific paper, 4 issues of the new and improved Entomological Newsletter, and several presentations to school groups as well as organizing an Insect Activity Booklet.

Paul Fields
ESM Regional Director to ESC

Annual Report of the Entomological Society of Ontario

The Entomological Society of Ontario had its Annual General Meeting for 1991 in conjunction with that of the Société Entomologie du Québec and the Entomological Society of Canada in Montreal. The next AGM will be held at Queen's University, Kingston, Ontario from 23-25 October 1992.

The *Proceedings of the Entomological Society of Ontario* for 1991 (Volume 122) was late, being published in June 1992. It contained 17 articles. The 1992 volume (123) is in progress and should be published at the usual time (early 1993) or slightly earlier (late 1992). Three newsletters have been sent to the membership (September, January, and May).

The ESO has taken possession of its rooms at the University of Guelph. Furniture has been obtained, the floor carpeted and the walls and ceiling repaired and painted. The rooms are available, upon request, to entomologists needing temporary space to work with the ESO library or in entomology generally.

The ESO has undertaken to provide 2 new scholarships for students to help in travel ($250) and for the Outstanding student paper in the *Proceedings* ($250). The revised constitution was ratified by the membership. It will be published in the *Proceedings* (Vol. 123).

The Society has decided to give free membership to students, but they will not receive the *Proceedings* unless the regular student membership is paid. Current membership stands at 249, a slight decline from last year. The breakdown of memberships is 171 regular, 45 retired, 25 students, and 8 amateurs. The subscriptions and exchanges continue to remain fairly constant.

New officers elected are:
President elect: Jean Hollebone
Directors: Cynthia Scott-Dupree & Howard Thistlewood
The ESO representative to ESC will be reviewed as the present representative's term of three years will expire after the AGM of the ESC.

Peter G. Kevan
ESO Regional Director to ESC

Rapport Annuel de la Société d'Entomologie du Québec

La réunion annuelle 1991 de la SEQ a été tenue du 21 au 23 octobre conjointement avec la SEC et SEO à l'Hôtel Ramada Renaissance de Montréal. L'Université du Québec à Montréal était l'hôte de cette réunion (responsables: Charles Vincent, Daniel Coderre, Yves Mauffette, Michèle Roy et Noubar Bostanian). Près de 300 participants ont assisté à quatre symposia et près de 150 communications et posters scientifiques. La SEQ y célébra son 40ième anniversaire de fondation et marqua l'évènement par le présentation de parchemins à neuf de ses membres fondateurs: MM. L. Auclair, J.R. Beaudry, A. Beaulieu, J. Belcourt, A. Benoît, A. Cloutier, L. Daviault, R. Martineau et P.E. Mercier. Les décorations Léon Provancher catégories professionnel et amateur 1991 ont été décernées au Dr Charles Vincent et à M. Raymond Hutchinson. Le Dr Léo Raynault était recu comme membre émérite et le Dr Claude Ritchot comme membre honoraire.

La réunion annuelle 1992 se tiendra à l'Université du Québec à Chicoutimi les 15 et 16 octobre et aura pour thème "l'entomologie et l'informatique au service de la faunistique". Le Dr André Francoeur est responsable de cette réunion. Un colloque regroupant des conférenciers québécois, canadiens et européens ainsi que plusiers communications scientifiques y seront tenus. La banque entomologique des insectes du Québec (BADIQ) sera présentée pour la première fois au congrès de la SEQ 1992.

La vulgarisation scientifique de l'entomologie continue de s'accroître au Québec. La AEAQ (association des entomologistes amateurs du Québec) demeure très active. L'Insectarium de Montréal, ouvert au public en février 1990, acceuillait son milionnième visiteur cet été. Ce musée s'est doté d'une volière extérieure, comprenant des dizaines de plantes hôtes et nectarifères ainsi que des centaines de papillons de 16 espèces indigènes au Québec. La SEQ conjointement avec La maison des insectes de la région de Québec ont contribué à la conception et à la publication du livre *Les insectes: 200 questiones et réponses*. La SEQ a également produit en collaboration avec le ministère du loisir, de la chasse et de la pêche du Québec, la publication "Analyse de 50 espèces en situation précaire au Québec et problématique de gestion". L'entomofaune du Québec inc. publie régulièrement un bulletin d'information pour ses membres ainsi que plusiers documents techniques.

Une convention de donation des archives de la SEQ a été convenue entre la SEQ et le ministère des affaires culturelles du Québec. Nous apprenons avec regret le décès de M. J.A. Cardinal, membre honoraire de notre société.

Daniel Coderre,
Représentant, SEQ à la SEC

Annual Report of the Acadian Entomological Society

The 52nd Annual Meeting of the AES was held on 28-29 July, 1992 in Charlottetown, P.E.I., and was attended by about 40 members from the three maritime provinces and Maine. The symposium, "Alternative Strategies in Pest Control", was worth-while and had six invited speakers including Dave Ferro (University of Massachusetts), Diane Gagnon (University of Ottawa) and Terry Stone (Abbott Laboratories). Bob Foottit spoke on behalf of the ESC.

The 53rd Annual Meeting of the AES will be again held in Charlottetown; a date and symposium have not yet been chosen. The proceedings and abstracts from the 51st Annual Meeting of the AES were published and distributed.

The Public Education Committee of the AES, chaired by Eric Georgeson, plans to request up to

$200 from the ESC for promotion of entomology in the schools. One idea is to establish a prize for the best entomology-oriented science fair project.

A $100 prize will be awarded for the best student paper at the 1993 AES Annual Meeting. Membership fees were increased from $6.00 to $10.00 for a regular member and set at $6.00 for student members. Jon Sweeney was nominated and acclaimed the regional director to the ESC, taking over for Eben Osgood.

Jon Sweeney
AES Regional Director to ESC

Report on the Electronic Mail Entomological Bulletin Board

The bulletin board ENTOMO-L is working very well. There are over 205 subscribers from all over the world, including Poland, Japan, Australia, New Zealand, western Europe, and South and North America. The exchanges have been interesting and frequent. Information postings have been for job opportunities, recent publications, societies' news, retirements and deaths. Exchanges have been on such diverse subjects as colours of insects' eggs, variable numbers of instars in insects, abundance of wasps, biocontrol, biodiversity, and so on.

To enrol, send your message to LISTSERV@VM.UOGUELPH.CA and your message SUB ENTOMO-L Your Name. To post a message, send to ENTOMO-L@VM.UOGUELPH.CA and enter your message as you would to a person.

Announcements have appeared in the *Bulletin* ESC and ESA. They have also been sent to the Royal Entomological Society.

Peter G. Kevan

Report on the Workshop on Canadian Systematics

On June 16 and 17, 1992 approximately 80 individuals from across Canada met at the University of Ottawa to discuss the nature of potential collaboration between government departments and agencies, universities, industries and professional societies regarding the future role and responsibilities of the Canadian federal government with regard to research, collections, training and services in *systematics*. All agreed to the concept of collaboration by Agriculture Canada (Biosystematics Research Division), Forestry Canada and the Canadian Museum of Nature. These three agencies already have a Memorandum of Understanding, based on the views that: (1) "The maintenance and wise use of biodiversity is essential to the proper functioning of Canadian and world ecosystems and the sectors and people they encompass and sustain"; (2) "Systematics provides an essential framework for understanding biodiversity that is necessary for its optimum maintenance and understanding"; (3) "Effective and efficient overall operation and management of systematics activities in Canada is necessary to ensure that results are meeting the needs in all sectors in an optimum fashion"; (4) "Reorientation of the nature and focus of research and budget limitations requires a more coordinated approach to the Canadian systematics effort in government agencies and universities".

A summary of the Workshop was published in the *Newsletter of the Biological Survey of Canada (Terrestrial Arthropods)* **11**(2): 32-34.

R.S. Anderson
Canadian Museum of Nature

1992 ESS/ESC Joint Meeting

WORKSHOP:

Regulation of Natural Enemies for Biological Control of Arthropod Pests of Plants and Livestock

1. Introduction - Chair: J. Laing, Dept of Environmental Biology, University of Guelph, Guelph, Ontario

- there are several types of classical biological control; for example:
  - **1)** Insects vs insects - need minimum restrictions
  - **2)** Insects vs weeds - need high restrictions
  - **3)** Pathogens vs insects - need high restrictions
  - **4)** Pathogens vs weeds - need the highest restrictions
  - **5)** Insect inundation vs insects - low restrictions
  - **6)** Bioengineered vs weeds and insects - maximum restrictions

- native biological control is similar; for example:
  - **1)** Insect inundation vs insects - minimum restrictions
  - **2)** Insects vs insects - minimum restrictions
  - **3)** Insects vs weeds - moderate restrictions apply
  - **4)** Pathogens vs insects - moderate restrictions
  - **5)** Pathogens vs weeds - possibly high restrictions
  - **6)** Bioengineered vs weeds, insects - maximum restrictions

We need rational regulations for each type of control. We cannot use one set of biocontrol regulations for all scenarios. Separate regulations are required because of the very different risk factors involved. For example native biocontrol types 1-3 have a minimum risk whereas type 6 may have a high risk.

We won't get separate regulations unless we participate in the process of regulation formation and we can't expect Ottawa to come up with the regulations in isolation.

Regulations should
- encourage safe use of biological control agents
- avoid unnecessary restrictions
- concentrate on exotic species

Plant Protection Division of Food Protection and Inspection Branch, Agriculture Canada, has the jurisdiction for regulating the importation of beneficial insects into Canada. Release of these insects, once imported, should remain under the Division's control, as is the case at present.

Therefore, the goal of this round table discussion is to have the Entomological Society of Canada set up a committee that would:

1) draft regulations for biological control of insects by insects and present these to Agriculture Canada, or

2) liaise with Agriculture Canada during the development of a set of guidelines for biocontrol of insects by insects, critique such regulations, and report back to the membership on progress.

2. Factors to Consider in the Selection, Introduction, and Release of an Exotic Parasitoid or Predator **M. Mackauer,** Centre for Pest Management, Simon Fraser University, Burnaby, B.C.

- five objectives must be satisfied in a successful biological control program:
  1) Control must be safe - the most important objective;
  2) Control must be predictable;
  3) Control must be consistent;
  4) Control must be sufficient for pest suppression; and
  5) Control must be achieved at a competitive cost.

- the unpredictability and inconsistency of biocontrol procedures have impeded their wider adoption

- common attributes between successful releases need to be assessed
  conditions for establishment depend on each situation
  prerelease studies are often limited.

- should develop protocols to test safety to the environment, i.e., specific host range
  not all agents need to be screened in the same way or with the same degree of detail; there must be explicit, formal procedures for evaluation
  there are already in place procedures for pathogens and weed control agents; no comparable protocols for the evaluation of parasitoids and predators (these are often not screened at all in the belief that they cannot harm the environment)

- systematics is integral to biocontrol studies; systematic studies of natural enemies are not cheap and are in danger of being streamlined out of existence

- on finding the right biocontrol agents, we need
  pre-release evaluation
  field studies and surveys
  lab studies

- attributes of successful agents
  high intrinsic rate of increase
  high searching efficiency
  aggregation on host patches

- use of population models
  density dependent models - although density dependence of a natural enemy may be important for model systems, there is little evidence for density dependence and system stability in practical systems

- effectiveness of biocontrol
  rather than the number of agents released, the critical factor may be the sequence of release; will a first released and perhaps less effective agent impede the colonization of a later released, perhaps more effective agent?

- development costs
  overall benefits are favourable
  cost not trivial e.g. cassava project in Africa is successful but cost $20 million so far

low-cost label has contributed to the perception that current funding levels are adequate
costs cannot be recovered, therefore the public should pay for biocontrol research
biocontrol in confined spaces is the exception; greenhouse grower should be expected to bear the costs

-theoretical ecology
population theory can explain the dynamics of natural systems, but has limited application in managed systems
in classical biocontrol, the only commonality in the new & old locality may be the food source; if the two environments differ structurally, the impact of the control agent on its host may differ as well

- in summary:

1) safety The first objective of pre-release evaluation must be to ensure that an exotic agent is environmentally safe. No agent, including insect parasitoids and predators, should be released in the field except after it has been evaluated to determine its host or feeding range. We must reassure the public that biocontrol is safe.

2) control The second objective of pre-release evaluation must be effectiveness. We must convince the public that biocontrol will work. Unless a candidate for release can be shown to contribute to pest control, it should not be released. To release an agent solely on the basis that it will do no harm is insufficient justification.

3) engineering solutions Greater emphasis must be placed on finding engineering solutions to biocontol problems such as sampling and rearing. While ecological theory should not be ignored, the solution of practical problems is likely to depend on technological improvements rather than new theories.

Question: What do you mean by engineering solutions?

Mackauer: We need a better understanding of the mechanisms of biocontrol, i.e. sampling, rearing, and release methods. This information is often not available, yet practical aspects are very important for successful control.

Comment (Laing): Good management is also important.

3. The Importance of Taxonomic Support for Introduction, Release, and Evaluation of Exotic Biological Control Agents **J. Huber,** Land and Biological Resources Research Centre, Agriculture Canada, Ottawa

The definitions from the FAO guidelines (Article 4, 4.2.1, 4.4.2, 6.1.4, 10.4.2) are relevant to systematics. These articles deal with accurate, unambiguous identification of candidate agents and the deposition of authoritatively identified voucher specimens.

Both classical and non-classical biological control cannot be developed or applied efficiently without an adequate biosystematic foundation. The *Aphelinus* spp. introductions for Russian wheat aphid are a good example of the kind of errors that can occur. The material should have been identified by an expert before release. Because this did not occur we now have several species introduced, including one already known from North America.

Problems facing taxonomy include too few taxonomists and too many insect species, a lack of good collections and voucher specimens, and a haphazard system for labelling, preserving, and tracking vouchers from past research programs. Most of the species introduced for biological control have been named by specialists outside Canada, yet BRC taxonomists are expected to confirm identifications of arriving specimens without the vouchers, the background collections of exotic material, or the experts.

Some rules to follow:

1) before planning introductions ask a taxonomist what already exists in NA and where to go for centres of diversity
2) keep voucher specimens so accurate id can be made
3) support in writing the need for more taxonomists

The prompt availability of a correct scientific name can save time, money, and manpower, it can increase the likelihood of biocontrol success, and it is important for evaluation of effectiveness and essential for communication of results.

Question (Soroka): Since Biosystematics Research Division staff cannot personally identify all the material sent in, can they supply a referral list of experts from other institutions?

Answer (Huber): Individual taxonomists who examine the material should be doing this. Perhaps BRD personnel send specimens back with minimal explanations so that clients will be concerned at and question the lack of expertise and write letters in support of more taxonomists.

Comment (Lysyk): Isn't that attitude self-defeating?

Answer (Huber): BRD staff have to balance getting identifications done with getting their own research done.

Question (Schmidt): Is there a global network of systematic experts? Does Canada need an expert in everything?

Answer (Huber): Yes a global network exists but the problem is that non-BRD taxonomists aren't obliged to do the identifications. We can't totally rely on this mechanism.

4. Current Regulations for Importation, Quarantine, and Release of an Exotic Insect for Biological Control **Doug Parker,** Central Plant Health Laboratory, Agriculture Canada, Nepean, Ontario

The Plant Protection Act has been used to control the entry into Canada and use, including release, of most biocontrol organisms. Authority under the Act is strongest for organisms associated with plants. We have the statutorily derived responsibility to evaluate and regulate organisms which are, or have the potential to be, plant pests.

A permit is issued for all living insects, mites, nematodes, and terrestrial molluscs that are allowed entry into Canada. The ability to bring living organisms into Canada is a privilege and not an individual right. In order to import living organisms into Canada, a person must fill out an application form and submit it to the Permit Section of the Plant Protection Division, Food Production and Inspection Branch, Agriculture Canada, Ottawa. There is an assessment of the risks involved, and the individual may or may

not be granted a permit to import. The assessment is based not only on the organisms involved, but also the source, destination, and purpose of the importation. This is not a dictatorial process of the regulators on the importers; there are negotiations as to the conditions of import, and compromise and concensus are necessary on both sides.

In the case of phytophagous insects for classical biological control of weeds, research scientists develop screening reports for the agents they wish to import. Such reports include information on the taxonomy, host range, phenology, and ecological requirements of the agent. Screening reports are circulated among the advisors in the Biocontrol of Weeds Review Committee (Research Br., Agriculture Canada).The Canadian committee then makes recommendations to the Director, Plant Protection Division on the release, who indicates to the applicant whether an agent can or cannot be released. There is agreement between the Canadian and U.S. committees (TAG in the U.S.) to comment on each other's reports in a timely manner before the agent is released.

The system for the regulation of phytophagous insects works quite well. The shipments arrive at quarantine facilities; their taxonomic identity is established. Agents are checked for parasites or disease, and imported plant material is destroyed. In some instances, the organisms may be reared for several generations before release.

In the case of predators and parasites, the process is somewhat different. Releases of exotic arthropod parasites may seldom represent a significant threat to other non-target organisms or plants because emphasis is generally placed on host-specific natural control enemies. Arthropod parasites may present the lowest risk of all categories of biocontrol agents. The parasite is studied in the country of origin to determine the possible host range, distribution in nature, phenology, and niche requirements. The organisms may be imported into quarantine in Canada for further study. The shipment usually enters through a quarantine facility that has taxonomic support. Obligatory hyperparasites and entomopathogens are eliminated. Voucher specimens must be deposited in the Canadian National Collection of Insects, Ottawa. The risks are then assessed and permission may or may not be granted for the release of the agent in nature. At the present there are very few releases of predators and parasites in Canada that have not already been released into the United States.

It may well be only a matter of time before protocols/guidelines and new regulatory policies are developed. Regulatory biologists rely on scientists to provide the rationale for regulatory policy. Negotiations between scientists and between scientists and the lay public is one of the keys to success in the advisory process. There is always the danger of over-regulation of biocontrol agents. One way to avoid new regulations under other Acts is to ensure that existing controls are adequate for reassurance of the public and administrators. Plant Protection biologists are interested in developing guidelines and advisory groups of outside experts to help bolster regulatory decisions.

No Questions were allowed due to time runover.

5. Comparison among Canadian, American, and Australian Approaches to Classical Biological Control Regulations Peter Harris, Agriculture Canada Lethbridge Research Station, Lethbridge, Alberta

There are four parts to any biocontrol program: scientific, social (public interest), political (funding) and legal aspects. Most scientists ignore the last component, yet are surprised when regulations block their way.

In Canada the 1990 Plant Protection Act legislates biocontrol. Agents are regulated before they are released. In Australia the Biological Control Act of 1984 defines biological control as "organisms of a particular kind shall be taken to be controllable by biological means if, and only if, these organisms can be controlled by the release of live organisms of another kind". The Act requires the Minister to appoint a Biological Control Authority. If the Authority is satisified that the risks are significantly less than the benefits they shall (ie. must) approve it.

In the U.S. the Plant Quarantine Act of 1912 and the Federal Plant Pest Act of 1957 govern biological control; they prohibit the importation and movement of plant pests unless authorized by USDA. They may not stand up to legal challenge as they have no environmental impact component. The 1969 National Environmental Policy Act prohibits projects which are negative to the environment.

For weed biocontrol projects, a researcher submits a report to the Plant Protection and Quarantine Service of APHIS, which refers it to a multinational Technical Advisory Group for approval. The legality of the TAG review is questionable. It has no mission statement, and cannot block release of an organism into Canada.

NEPA legislation, concerned only with environments surrounding industrial sites such as factories and mines, is not very satisfactory when dealing with biocontrol agents. There is no provision in any legislature for risk benefit analysis prior to release approval.

APHIS wishes to extend regulations to include parasites and predators. Biocontrol regulations regarding predators and parasites are now being drafted that are "Biocontrol-friendly" and may result in legislation that will withstand legal challenge. The new APHIS mandate states that:

1. Biocontrol, when applicable, is the method of choice for management of both agricultural and environmental pests.
2. Wherever possible, it should be used to replace chemical pesticides.
3. APHIS will develop regulations to facilitate the release of safe biological agents with examples of the data needed and time limits for agency review.
4. The regulations must change as science progresses, done in consultation with scientists and the public.

The Canadian Plant Protection Act 1990 is the legislation used for governing classical biocontrol, but nowhere are procedures for approving the release of biocontrol agents mentioned. It describes itself as an Act "to prevent the importation, exportation, and spread of pests injurious to plants and to provide for their control and eradication, and for certification of plants and other things". Unfortunately it does not adequately cover biocontrol since weed-feeding organisms are clearly pests and organisms that do not attack plants are outside the jurisdiction of the Act. Thus, if challenged in court, the release of biocontrol agents against either weeds or other pests is likely to be found illegal, as was the case in Australia.

The practice is better than it seems since detailed studies of the agents are reviewed before release approval is given. The need to enshrine rigorous risk-benefit analysis in regulations and guidelines so that it is apparent to the public that the decisions to accept or reject an agent are scientifically based, and biocontrol is on a better basis to survive challenge in the courts. To ensure the use of good science, the new legislation should be prepared in consultation with scientists.

No questions were allowed due to time runover.

6. A Federal Proposal For Regulation of Biological Control Agents **Gil Flores** Pesticide Directorate, Agriculture Canada, Ottawa

This round table is the first step in the consultative process towards development of biocontrol guidelines. I will present a proposal for regulation of biocontrol agents, and welcome positive feedback from industry, the public, academia, and federal and provincial researchers.

A biological pest control agent is a living organism introduced into the environment to control the population or biological activities of another life form considered to be a pest. Pest control agents may be microbial, such as bacteria, algae, fungi, viruses, etc, or higher biocontrol agents, such as insects, mites, or nematodes.

Importation of such agents is authorized under the Plant Protection Act. Import permits are granted for new, already established, or previously introduced biocontrol agents. Historically, these are unregulated after importation.

The major issues facing biological control are

1. Performance
2. Overall quality and purity
3. Health effects, and
4. Effects on the environment

There is a need for regulation of biological control agents. The regulatory system should be simple, not too restrictive to industry, and should encourage research. However, it must also keep in mind ecological and human safety, quality assurance, and performance. At the present, weed biocontrol agents are assessed by an Ad Hoc Committee, while insect biocontrol agents are assessed in house, by FP&I.

The suggested management process for domestic movement or release of biocontrol agents is:

Research activity on familiar (ie. traditional situation, ladybird beetle, *Encarsia,* etc.) or unfamiliar naturally occurring biocontrol agents would be exempt from regulation via the list of exempt agents. Research on exotic or genetically engineered biocontrol agents would require a permit before release, a label, and field inspection. For commercial production/release, familiar agents would be exempt via the exemption list, but would require a label, and quality control of the product by inspection. For unfamiliar endemic agents, there would be a precedent review, eventual exemption, and a permit, label, and quality control. Commercial use of exotic agents would require registration, a label, quality control, and enforcement, while genetically engineered products would require registration via tiered data requirements (a peer review, knowledge of the basis of the bioengineering), a label, quality control, and enforcement.

The proposed Regulatory Policy is based on a tiered approach where tradional insects will require virtually no regulatory oversight, whereas new commercial biocontrol agents like *Trichogramma* will require less stringent regulatory oversight in relation to the genetically-engineered biocontrol agents.

The regulatory guidelines should demonstrate: (1) reasonable evidence that the biocontrol agent will control the target pest, (2) knowledge of the biocontrol agent and the target pest, and (3) that the effects on users, non-target organisms and the environment have been considered.

Future considerations include research needs, co-ordination and funding, regulation, and

consultation. A Biocontrol Advisory Committee similar to the present Technical Advisory Committee for weeds should be set up, and formalized within the CASCC/CARCC system. Players will be the provinces, the universities, and Agriculture Canada. Pesticides Directorate will publish a regulatory proposal; we welcome discussion of that proposal.

Question (Gilkeson): What do you mean by the term Label?

Answer (Flores): A research label is an interim registration label.

Question (Laing): What is a label for exotics?

Answer (Flores): You need quality control assurance, so that claims can be substantiated.

Question (Laing): How can we label classical biological control agents? Only 30% of introduced agents become established, 5 to 10% become successful. How can we guarantee performance of exotic species?

Question: What is the distinction between a research release and a general release by Government?

Comment (Laing): Establishment has occurred from as few as 2 individuals. This needs to be clarified.

Question: How do you define genetic engineering? For example, would selecting for cold tolerance be genetic engineering?

Answer (Flores): This would not be considered genetic engineering.

Question: For a particular species what level of control can you specify when several species may be needed?

Answer (Mackauer): We have to acknowledge that there is a problem in defining this.

Comment (Makowski): Level of control is difficult to define a priori, if, for example, many insects are necesary for control.

Comment (Laing): Don't be frightened by the term "label". Say just what it is, what its host is, where it is from, and how long will it live.

Answer (Mackauer): We must address the issue, otherwise the environmentalists will say we are polluting the environment.

Comment (McClay): The details have been presented by Gil Flores but we need to know what principles these are derived from.

Answer (Flores): The attempt presented here is to provide a framework upon which to build. We need to have assurances of quality for greenhouse biocontrol agents, etc.

Question (Gilkeson): How often will you assess quality?

Answer (Mackauer): There is a large body of literature on general quality control, with timing depending on the variability of the system.

Question (Kevan): How will the regulatory process be used to regulate pollinators (i.e., the present problem of introduction of *Bombus terrestrus*)?

Answer (Parker): As you know we have attempted to regulate that introduction.

Question (Kevan): Who is going to determine what is an Africanized honey bee and what is not? Bureaucrats won't listen and we are concerned for our bee industry.

Answer (Huber): How do you distinguish between European and Africanized honeybees? BRD has asked for expertise to distinguish the two, but none has been given. Many insects originally identified as something may now be identified as something else.

Question (Bourchier): How does an insect get on the priority (exemption) list?

Answer (Flores): We will start with a very small list of known biocontrol agents and try to build on it.

Question (Gilkeson): Quality control is okay for 'canned' species but what about released species (i.e., how do you assess the quality of foraging behaviour)?

Answer (Mackauer): There is a need to assess in objective ways. We need to hire the personnel to meet the objectives.

Question (Surgeoner): Even though there is no quality control guarantee people still have the right to go out and buy things (eg. backyard bug zappers). Why can we buy commercially available parasites without any guarantee of quality control?

Answer (Mackauer): The government shouldn't be in the business of protecting you from your own stupidity. But in the case of greenhouse control agents the potential for escape exists, therefore we need to regulate.

Comment (McClay): The regulations should address the importation of an insect into the country not whether or not you can sell it once it is in the country.

Question (Goettel): Do these guidelines apply to microbials?

Question: What about insects that carry diseases, rickettsias or polydnaviruses? Will these insects fall under microbial or parasite regulations?

Answer (Flores): That will not come under microbials but will be looked after through the screening process, i.e., pre-release.

Question (Goettel): What about microbials that are to be used as classical (i.e., exotic) agents?. There are no regulations.

Answer (Parker): The Plant Protection Division has issued permits for importation of plant pathogens. Usually these agents are maintained in quarantine. It is assumed that Pesticides Directorate and Plant Quarantine Directorate have worked together.

Question (Goettel repeated): I am asking about classical biocontrol with pathogens. This is different than inundation. There are no guidelines. For example, there have been some pathogens brought into the U.S. for Russian wheat aphid control.

Question (Parker): Are any being brought in?

Answer (Goettel): No

Answer (Parker): When it does happen Plant Protection Division will regulate that form of classical biocontrol.

Answer (Harris): When a permit for knapweed rust was applied for Plant Health turned it down but the disease showed up anyway. Likely microbial classical control agents will fall under the new Plant Health Act. An amendment should be added to strengthen the law.

Question (Goettel): How are you going to argue in what way microbials affect plants?

Crowd: It's "another thing".

Comment (Parker): Cows and vegetarians are plant pests. Laws are written by lawyers and if you can present a logical argument to a judge and if he accepts it then you win the argument.

Question (Dolinski): Now there are no regulations at all, these are merely points of discussion?

Answer (Flores): There are no regulations at present.

Comment (Dolinski): It is apparent that we need a consultative process that involves ESC and allows input from entomologists.

Comment (Laing): What Gil Flores is asking for is help and guidance for putting together the regulations.

Comment (Flores): The Biocontrol Working Group (of Agriculture Canada) will meet to decide on the process.

Comment (Makowski): In the case of microbials scientists were not brought in soon enough during regulation development and we now have impossible regulations.

Comment (Dolinski): There is a unique opportunity here to avoid the microbial situation and get in on the ground floor for regulation development for insect control agents.

Comment (Mackauer): We need regulations as a mechanism for conflict resolution that will protect scientists. It would be unfortunate if a bad release turned biological control sour. To date we have been working in a vacuum, and have not been challenged because no one has made a monumental blunder yet.

Proposal: To send a resolution to the ESC Science Policy Committee recommending that a multidisciplinary advisory body be set up to input into the formation of regulations.

Workshop adjourned.

Submitted by J.J. Soroka
Agriculture Canada
Saskatoon, Saskatchewan

MINUTES

Governing Board Meeting
Delta Bessborough
Saskatoon, Saskatchewan
September 26, 1992

The meeting was called to order at 0900 hours on September 26, 1992 by President R. Ring. Those present were R. Ring, President; P.W. Riegert, First-Vice President; G.H. Gerber, Second Vice-President; J.E. Laing, Past President; L.A. Gilkeson, D. Quiring, K.W. Richards, G. Boivin, S.A. Marshall and J. Turgeon, Directors-at-Large; A. McClay (ESA), J. Soroka (ESS), P. Fields (ESM), P.G. Kevan (ESO), D. Coderre (SEQ), and J. Sweeney (AES), Directors from Affiliate Societies; R.G. Foottit, Treasurer; A.B. Ewen, Scientific Editor, *The Canadian Entomologist*; F.F. Hunter, *Bulletin* Editor; R.J. West, Secretary; K. MacKenzie, Student Affairs Committee; L. Safranyik, S. Smith and H.V. Danks, observers. J.N. McNeil presented the reports of the Fellowships and CFBS Committees. D. Dixon presented the Annual Meeting Committee Report for the 1994 meeting in Winnipeg.

1. Notice of Meeting

Notice of this meeting was mailed on July 27, 1992. Notices were published in the March and June, 1992 issues of the *Bulletin* (Vol. 24).

2. Absences and Proxies

R. Vernon (ESBC) and V. Behan-Pelletier were absent. R. Ring served as proxy for R. Vernon.

3. Additions to and approval of the Agenda

The agenda was accepted following a motion by J.E. Laing, seconded by P.W. Riegert.

Carried **No action required**

4. Minutes - Governing Board Meeting, Oct 19/91

Minutes of the October 19, 1991 meeting of the Governing Board were circulated to the Board on November 4, 1991 and published in the December 1991 *Bulletin*. The following corrections to the minutes have been made: Call to order: J.E. Laing for J.N. McNeil; Item 4: S. Marshall for A. Ewen; Item 9.2.3: 'subscribe' for 'suscribe'; Item 9.2.11: add 'Carried' below motion; Item 9.2.13: 'Endangered Species Committee' for 'Endangered Committee'.

G. Gerber moved and D. Quiring seconded that the corrected minutes signed by the President and First Vice-President be accepted.

Carried **No action required**

5. Minutes - Annual General Meeting, Oct 22/91

The minutes will be presented for approval at the Annual General Meeting.

6. Minutes - Governing Board Meeting, Oct 23/91

Minutes of the October 23/91 meeting of the Governing Board were circulated to the Board on November 4, 1991 and published in the 1991 Bulletin. The following corrections to the minutes have been made: Item 6: 'New' for 'Other'; Item 7: 'Other' for 'New' and 'other' for 'new'.

K. Richards moved and D. Coderre seconded that the corrected minutes signed by the President and First Vice-President be accepted.

Carried **No action required**

7. Minutes - Executive Council Meeting, April 21/92

The minutes were circulated to the Board on May 15, 1992.

8. Business arising from the previous minutes:

The following items arising from the previous minutes were identified and moved for discussion under New Business.

8.1 Producing Society Publications from Computer Disk and Cost Savings (Item 9.2.3, Executive Council Meeting, April 21, 1992). Move to Item 9.2.3.1.

8.2 Alternative Means of Mailing the *Bulletin* (Item 9.2.3, Executive Council Meeting, April 21, 1992). Move to Item 9.2.5.2.

8.3 Nominations for CFBS Positions (Item 9.2.6.1, Executive Council Meeting, April 21, 1992). Move to Item 9.2.6.1.

8.4 Insect Transmission of Plant Diseases (Item 9.2.25, Governing Board Meeting, October 19, 1991; Item 9.2.25, Executive Council Meeting, April 21, 1992). Move to Item 9.2.25.

9. New Business

9.1 Correspondence

R. West introduced items of correspondence which required no formal action.

9.1.1 Deaths

Notice was given of the deaths of Doug Miller, Tom Silvers, Jim Short, Mike Timonin, Bill Mason, Bessie Robinson, Floyd Eves, Elizabeth Arnason, Mukul Mukerji, Audrey McDonald, and Nancy Morrison.

9.1.2 Newfoundland Insectarium

The Directors of the Newfoundland Insectarium, Lloyd Hollett and Gary Holloway, requested that the ESC support or endorse the Insectarium. The Board agreed that the President, R. Ring, would send a letter of support to the Newfoundland Insectarium.

9.1.3 1992 ESC Resolution

President Ring received 12 replies to 32 letters sent out regarding the ESC Resolution on Systematics made at last year's Annual General Meeting. Dr. David Suzuki, one of the respondents, felt that the resolution could have been stronger and that it should have gone beyond protecting what he regarded were just the narrow research interests of entomologists.

9.1.4 CLBRR, Agriculture Workshop on Systematics

B. Anderson attended the Agriculture Canada workshop on systematics in June 1992 on behalf of ESC. Final proceedings will be published in October. Agriculture Canada, Forestry Canada, and the Canadian Museum of Nature plan to sign a MOU to cooperate on the development of policies related to systematics. A national network among various agencies to link museums was started. Recommendations to protect designated collections were made.

9.2 Reports from Officers, Trustees, Representatives and Committees

J.E. Laing moved and L. Gilkeson seconded that all reports be received.

Carried **No action required**

9.2.1 Executive Council

The Executive Council's report will be presented at the Annual Meeting. Updates by the President are regularly published in the *Bulletin*.

Action: R. Ring

9.2.2 Treasurer

The Society finished the year 1991 with a financial deficit, mainly due to publication costs. Production of the book, "Diseases and Pests of Vegetable Crops in Canada", will incur additional costs. However, the Scholarship Fund continues to grow and the Society's investment funds are doing well under long-term bond rates. R. Foottit thanked Sandy Devine and Gary Gibson for their help in 1991/92. Concern was expressed over the decline in Regular membership: to 488 in 1992 from 663 in 1988. Student Membership is down to 61 (1992) from 100 (1988).

9.2.2.1 Auditor's Report

The Auditor's Report for 1992, as published in the June 1992 *Bulletin*, will be presented to the Annual General Meeting for approval. The deficit is mainly due to increased costs of producing the Society's publications.

Action: Treasurer

9.2.2.2 ESC Headquarter's Committee

R. Foottit summarized the activity of the Committee during the past year. Minimal repairs have been required and renovations have been postponed until the financial health of the Society recovers. The renter of the top floor defaulted on some monthly payments and another renter has agreed to assume the present lease until it expires in January. Jeff Cumming has replaced Gary Gibson as Chair of the Headquarter's Committee. B. Foottit will look into the possibility of hiring a property manager.

9.2.3 Finance Committee

Societal investment decreased 33% from $370k in 1988 to $245k in 1991. Expenditures exceeded income by $84k in 1991 resulting in a deficit of $52 625, $16 400 more than expected. The budgeted deficit for 1992 is $47k, excluding expenses related to publication of the CPS/ESC book and interest from investment capital.

The Committee recommended that the Board not approve the budget proposed by the Treasurer unless the cost-recovery measures listed below are carried out effective January 1, 1993:

a) Increase page charges for *Can. Ent.* to $30/page from $25/page. This would reduce losses to $25/page and likely increase revenue by $6 000 (assuming 1200 published pages in 1993).

b) Increase page charges for the *Memoirs* to $45/page from $25/page. This would reduce losses to $26/page and likely increase revenue by $14 000 (assuming 700 published pages in 1993).

c) The *Memoirs* be reserved only for publications more than 100 printed pages long to avoid proportionally higher production costs for smaller publications.

d) Increase rates for author reprints by 10%. This would add about $1 500 in revenues.

Despite these increases, page charges for Society Publications will remain very favourable against similar journals in North America.

These recommendations would increase revenue by about $21 500 and reduce the projected 1993 deficit to $14 225. This represents a balanced budget excluding the Societal subsidy of $17 000 towards CFBS membership. The Society cannot continue to subsidize CFBS membership beyond 1993.

A. Ewen was opposed to an increase in page charges and would like charges for *Can. Ent.* reduced. Manuscript submissions are declining perhaps because of competition from European journals which do not have page charges. The Chair of the Publications Committee did not respond to the call for increase in page charges because of lack of time and requested that his committee have time to review the Finance Committee's recommendations.

The following suggestions for review by the Finance and Publications Committees with regard to reducing costs of the Society's publications were made.

1) Explore offshore printing (eg.,Malaysia, Korea, etc.).

2) Increase page charges and the possible effects this will have on membership and submissions to the Journal and Memoirs.

3) Advertise to libraries to obtain new subscriptions.

4) Apply for an NSERC grant (publications) which would

a) subsidize all publications of the Society

b) subsidize the *Memoirs* only (with the justification that we could lose this publication without support).

5) Explore costs and feasibility of publishing the *Memoirs* and/or *Can. Ent.* on CD Rom or 3.5" diskettes. Abstracts of systematic works and keys would have to be published as hard copy until such time as the zoological code is changed.

6) Change the format of the journal - page size, colour of cover, design of cover, position of table of contents, two column pages, smaller type, etc.

7) Change printers.

8) Find a printer that encourages submission of camera-ready copy.

An effort towards gaining Sustaining Members should be made. Monthly book keeping will be done soon by computer.

P. Fields inquired whether or not a fund-raising committee should be set. R. Ring suggested that a Marketing Committee be struck.

G. Gerber moved and L. Gilkeson seconded that a continuing committee, the Marketing Committee, be struck to raise funds for the Society.

Carried

Action: Bylaws, Rules & Regulations Committee, President, Finance Committee, Publications Committee

9.2.4 Scientific Editors

9.2.4.1 Editor - *The Canadian Entomologist*

A. Ewen presented an account of office expenses and the number of manuscripts received, accepted, rejected and withdrawn. He announced that Dr. Jacqueline L. Robertson, until recently co-editor of the *Journal of Economic Entomology*, will begin an appointment as Associate Editor of *Can. Ent.* (forest entomology and pesticide resistance and management). Suggestions for authors/topics for the C.P. Alexander Fund will be welcomed (The Fund pays for page charges and 100 reprints).

No action required

B. Foottit wanted a clear policy set for Contract Editing. Permission to contract out editing can be granted with the approval of the Executive Council.

B. Foottit recommended that a job description including reporting relationships be written for the Managing Editor of Society publications. The Board directed the Publications Committee to do this.

Action: Publications Committee

9.2.4.1.1 Review of French Abstracts

A. Ewen noted that the quality of French abstracts not translated by *The Canadian Entomologist* is not always of a high standard. J. Turgeon and G. Boivin will review and correct all abstracts not translated by F. Harper. A. Ewen will write a letter to F. Harper advising her of this arrangement.

Action: A. Ewen

9.2.4.1.2 Design of *The Canadian Entomologist*

In a letter to R. West, V. Behan-Pelletier took exception to the choice of neon lime green for the cover of *Can. Ent.* and suggested that a redesign of the publication is in order. As libraries rebind issues in a hard cover annually, the printing of the table of contents on the inside of each issue is suggested. The Publications and Finance Committees were charged with improving the design of *Can. Ent.* and providing cost estimates (See 9.2.3).

Action: Publications Committee

9.2.4.2 Editor - *Memoirs*

V. Behan-Pelletier summarized activities of her office in 1992 and thanked A. Ewen, B. Patterson and S. Devine for their help. Four *Memoirs* will appear in 1992.

No action required

H. Danks suggested that editorial work on the *Memoirs* begin before translations of abstracts are received by B. Patterson.

9.2.4.2.1 Page Charges for *Memoirs*

The Printer of *Can. Ent.* and the *Memoirs* suggests that a *Memoir* should be a minumum of 112 published pages to warrant a page charge similar to that of *Can. Ent.* ($25/pg). Three of four memoirs published in 1992 are less than 100 pages and represent costs to the Society of $90/page! The Finance and Publications Committees will review page charges.

Action: Finance and Publications Committees

9.2.5 Editor - *Bulletin*

F. Hunter summarized costs incurred by her office in 1992 and thanked typists, Cathy-Jane Green and Betty Peloquin, and Charles Vincent (Bilingualism Committee) for their help.

9.2.5.1 New Printer Needed

F. Hunter sends a camera ready copy to the printer. The company that presently prints and mails the *Bulletin* takes too long and F. Hunter is evaluating other printers. G. Gerber cautioned that a change in printers be closely examined. J. Soroka indicated that 250 copies of the 1992 program were printed from e-disk in 5 days.

Action: F.F. Hunter

9.2.5.2 Alternative Means of Mailing the *Bulletin*

Shrink-wrapping might save money.

Action: Publications and Finance Committees

9.2.5.3 Advertising Policy and Charges

The Publication Committee has set the following policy and charges for advertising in the *Bulletin*: Space in the *Bulletin* can be purchased for advertising products that promote entomology. The rates are $100.00 (Canadian) for a full-page ad (12 cm by 17 cm), and $50.00 for a half-page ad (12 cm by 8.5 cm).

9.2.5.4 Reducing Costs of the *Bulletin*

see 9.2.5.1-2.

9.2.6 Nominating Committee

Second Vice-President: Ian Smith and Les Safranyik were nominated by the Committee and their names were published in the March *Bulletin*. No further candidates were nominated by members of the Society and only these two names were placed on the official ballot.

Directors at Large: The Committee nominated Hugh Danks, Sandy Smith and David Raworth and the names of all three were published in the March *Bulletin*. No further candidates were nominated by members of the Society and only the names of these three were placed on the official ballot.

Fellowship Selection Committee: The Committee nominated Ed Becker, Doug Eidt and Ray Morris and the names of all three were published in the March *Bulletin*. Only the names of these three were placed on the official ballot.

No action required

9.6.6.1 CFBS Nominations

G. Gerber moved and R. Ring seconded that nominations for positions on the CFBS Board of Directors be added to the duties of the Nominating Committee.

Carried **Action: Bylaws, Rules and Regulations Committee, Nominating Committee**

9.2.7 Elections Committee

The successful candidates were:

Second Vice-President:	Dr. Les Safranyik
Directors-at-Large:	Dr. Sandy Smith
	Dr. Hugh Danks
Fellowship Selection Committee:	Dr. Ed Becker
	Dr. Doug Eidt

J.E. Laing moved and P.W. Riegert seconded that the 1992 ballots be destroyed.

Carried **Action: A.B. Ewen**

9.2.8 Fellowship Committee

The nomination of Dr. Ring Cardé as a Fellow of the Society was ratified by the Board by mailed ballot on July 30, 1992. A minumum of 20 of the 25 Fellows who are neither Active nor Emeritus members of the Society are retired and are eligible for emeritus status. If these individuals were Emeritus Members, then the number of Fellows (excluding Emeritus Members who are Fellows) would be well below 10% of the Active Membership, a condition limiting the annual nomination of Fellows.

A. McClay moved and L. Gilkeson seconded that the Memberships, Bylaws, Rules and Regulations Committee and Fellowship Committee review, and clear up ambiguities pertaining to the definitions and privileges of Active Members, Fellows, Honorary and Emeritus Members of the Society.

Carried **Action: Membership Committee, Bylaws, Rules & Regulations Committee, Fellowships Committee**

The Board suggested that the following recommendations of the Fellowship Committee be taken under advisement:

a. "all Fellows who are currently neither Active and Emeritus Members be contacted and asked to rectify their status within one month. If this request is not met then their names be removed from the list of Fellows".

b. Standing Rule I.2a be changed to " the number of Fellows (excluding emeritus and honorary members that are Fellows) shall not exceed ten percent of the Active Membership, except in the event of a drop in Active Membership, when the percentage may temporarily be exceeded".

c. The concept of major contributions to entomology be the criterion in the selection of Fellows, rather than recognition of long tenure or socio-political clout.

The Secretary will advise the Fellowships Selection Committee of the above developments.

Action: R. West

9.2.9 Achievement Awards Committee

Recipients of the 1992 Awards were named in the September *Bulletin*. Dr. Glenn B. Wiggins was acknowledged as the recipient of the Gold Medal Award. Dr. Daniel L. Johnson was acknowledged as the recipient of the C. Gordon Hewitt Award. The Governing Board extended congratulations to both Dr. Wiggins and Dr. Johnson.

No action required

9.2.10 Annual Meeting Committee

9.2.10.1 Annual Meeting 1992 - Saskatoon

J. Soroka estimated a balanced budget of $21 700 based on an attendance of 160 persons. Strong support was received from the private sector and Saskatchewan Agriculture provided $2 000 towards the costs of the banquet. About 100 contributions to symposia, oral presentations and posters were received. The program includes a 'President's Prize' paper competition.

9.2.10.2 Annual Meeting 1993 - Sault Ste. Marie

J. Turgeon reported on the progress for the 1993 Meeting to be held at the Watertower Inn, Sault Ste. Marie, September 26-29. Several activities scheduled for the public and the city stressing participation with children. A good deal of sponsorship is anticipated. The plenary symposium will be on graduate training in entomology and will have input from the Student Affairs Committee. Other symposia will address the ecology of natural populations and natural products and insecticide development. The Entomological Society of Michigan has not yet indicated whether or not it will participate.

9.2.10.3 Annual Meeting 1994 - Winnipeg

Don Dixon reported on the progress for the 1994 Meeting to be held October 15-19 at a hotel yet to be determined in Winnipeg. The organizing committee will included Don Dixon as General Chair, Paul Fields as Science Chair and Richard Westwood as Fundraising Chair.

9.2.10.4 Annual Meeting 1995

R. Ring will ask ESBC to make an invitation to the ESC re the 1995 meeting.

Action: R. Ring

9.2.10.5 Change time of Annual Meeting

S. Marshall objected to the fall scheduling of the Annual Meeting because it interfered with university lectures. He suggested a summer meeting instead.

G. Gerber noted that attendance by university people has increased since 1977. Before that date, meetings were scheduled in the summers.

S. Marshall moved and J.E. Laing seconded that a vote on the scheduling of the annual Society meetings (fall, winter, spring, summer) be put on the next general ballot.

Carried **Action: Executive Council**

9.2.11 Bilingualism Committee

The Committee felt that F. Harper's translations of *Can. Ent.* abstracts into French were excellent and was encouraged by increased efforts by the Society to make the *Bulletin* more bilingual and by the Society's commitment to translate the book on diseases and pests of vegetables into French. Standing Rules of the Society were translated into French under contract and electronic and hard copies are in the possession of the Secretary and Chair of the Bylaws, Rules and Regulations Committee. Regular updates of these translations are recommended. C. Vincent has chaired the Bilingualism Committee for three years and would like to serve the Society in another capacity. The Board expressed their appreciation for Charles's efforts in advancing bilingualism in the Society. P.W. Riegert will appoint a new Chair.

Action: P.W. Riegert

The Secretary will write to C. Vincent regarding translation of the Bylaws.

9.2.12 Bylaws, Rules and Regulations Committee

Changes to Standing Rules and Committee Guidelines approved at the 1991 Annual Meeting were made.

No action required

9.2.13 Endangered Species Committee

Activities for 1992 included communication with COSEWIC, the Canadian Wildlife Service, the Nature Conservancy of Canada and the Canadian Nature Federation. A data base of candidates for endangered species status was prepared. Action proposed for 1992-93 includes the drafting of a document requesting the inclusion of invertebrates for presentation to COSEWIC, collaborating with the CWS on the development of federal legislation, updating the data base and sending it to interested groups,

and preparing papers on the status of protection for different habitats in various federal, provincial and municipal jurisdictions.

Action: Endangered Species Committee

9.2.14 Heritage Committee

The final book on Entomologists of Western Canada, "Entomologists of British Columbia", was published and distributed to members. Archival material was edited, sorted and sent to the National Archives of Canada. A 17-page catalogued list of ESC holdings in the National Archives was sent to the Secretary for filing. P. Kevan suggested that archival searches include the archives held at the University of Guelph.

No action required

9.2.15 Insect Common Names Committee

The Committee has reached the stage where the printing of the list of insect common names can be done now (with some outdated nomenclature) or delayed for an indeterminate period (to produce a more 'perfect' list). G. Boivin suggested that the list be kept on disk. H. Danks and K. MacKenzie were concerned that errors for major groups not be printed.

J.E. Laing moved and P.W. Riegert seconded that the common names list be produced and revised to date in English and French on electronic disk in a time frame and cost agreeable to the Committee and the Executive Council.

Carried **Action: E. Belton, D. Eidt, Executive Council**

9.2.16 Membership Committee

A new membership list was produced and mailed out to all members from the Ottawa Office. Members who did not renew for 1992 were contacted by mail, but most did not reply. Further steps will be taken to contact them. The Society's membership in good standing is 605. Student membership is being actively promoted. Application forms will appear in all issues of the *Bulletin* starting September 1992. There are two vacancies for Honorary Membership and a call for nominations will appear in the September 1992 *Bulletin*.

B. Foottit offered to send out a covering letter with the membership renewal forms.

L. Gilkeson moved and S. Marshall seconded that Student Members receiving the *Bulletin* but not the journal be assessed an annual membership fee of $20.

Carried **Action: D. Quiring**

S. Marshall moved and J. Turgeon seconded that Emeritus members be charged a $20 subscription fee if they wish to receive the *Bulletin*.

Carried **Action: D. Quiring**

9.2.17 Public Education Committee

The Committee disbursed a total of $400 in funds for public education programs in 1992. ESM and SEQ both received $200. The brochures "Entomology in Canada" (n=3k) and "L'Entomologie au Canada" (n=1k) were produced and printed for a total cost of $2161.22. The Board expressed its pleasure at the quality and content of the brochures. A memo from CFBS soliciting members for a roster of scientists that would serve as potential media contacts for science news was received by the Committee. ESC members Jeremy McNeil, Ian Smith and Roger Downer were on this roster. Vince Nealis, having served for 3 years as co-chair, requests that a replacement for him be found for the 1992-93 term. The

Board expressed its appreciation for the job that Vince Nealis and Jean Turgeon have done. P.W. Riegert will appoint a new Chair.

Action: P. Riegert

9.2.18 Publications Committee

"Instructions to authors" for *Can. Ent.* and the *Memoirs* were changed and now require authors of taxonomic papers to place descriptions of new taxa in proper context and to provide a key, where possible. All authors are now required to write references out in full. One application for page-charge waiver was made and granted, 25 books were received for review, 5 book notices were prepared and reviews of several books were received and published in the *Bulletin.* A marketing strategy document for the ESC/CPS book, was prepared by H.V. Danks, P.G. Kevan, S.M. Smith and L. Dosdall (Chair) in collaboration with members of the CPS for the Executive Councils of the ESC and CPS in April 1992. Other items included the appointment of a new Associate Editor and describing book review procedures of the Society to publishing companies. The Committee will respond to recommendations by the Finance Committee to raise charges for pages and reprints in time for the 1993 publication year and to increase subscription charges for *Memoirs* in 1994.

Action: Publications Committee

9.2.18.1 Rental of ESC Mailing List

J.E. Laing moved and J. Turgeon seconded that the ESC not rent their mailing list.

Carried **No action required**

Companies wishing access to Society Members were invited to advertise in the *Bulletin.*

9.2.19 Scholarships Committee

The 1992 Scholarship Award Winners are Ms. Maya Louise Evenden (Simon Fraser University) and Mr. Martin Hardy (Université Laval). John Cunningham has chaired the Committee for the past 3 years and wants to step down but has offered to assist the new Chair in assuming the responsibilities of office. The Board expressed its gratitude for John's dedication to the Committee during his tenure as Chair. P.W. Riegert will appoint a new Chair.

Action: P.W. Riegert

In a letter to the Secretary, A. McClay noted that some recent recipients of ESC scholarships were not members of the Society and that this was indicated as a reason by an ex-member why he left the Society.

P. Kevan provided an update on the progress of the 'Kevan' award. The funds are now deposited in the general scholarship investment account. It is the wish of the family that the award be related to the study of systematics and be awarded at appropriate time(s) but not necessarily on an annual basis. R. Ring suggested that the terms of reference of the 'Kevan' award be developed between the new Chair and the general wishes of the Kevan family.

Action: Scholarships Committee, P.W. Riegert

9.2.20 Research-Travel Grants Committee

Travel grants for 1992 were awarded to Mr. R.A. Anderson (University of Manitoba) and Mr. E.R. Lima (Université Laval) and this information was printed in the June 1992 *Bulletin.* A letter of thanks from Mr. Anderson was read.

No action required

9.2.21 Science Policy Committee

The Committee did not lobby governments to improve their science policies. The Society was requested by R. Ring to contribute to the development of legislation pertaining to the use of biocontrol agents other than beneficial insects. Dr. Peter Harris and some other ESC members sit on the federal Pesticides Review Committee. The Science Policy Committee is working with the Federal Biocontrol Research Support Group to establish policies affecting biocontrol regulations.

Any ad hoc committees developing science policy should report to the Science Policy Committee. Members are encouraged to identify and develop issues in association with the Committee.

9.2.22 Student Affairs Committee

A call for volunteers in the December 1991 and March 1992 issues of the *Bulletin* was successful and in addition to Elizabeth Tomlin (Simon Fraser University), Troy Danyk (SFU), David Bergvinson (University of Ottawa) and Richard Gagné (University of Missouri) are now members of the Committee. Ten of the 61 students responded to a questionnaire (English and French versions) to solicit student input and to aid in topic choice for a potential job symposium. The responses led to a decision to hold a job skills symposium under the topic "Writing Grants and Research Proposals" at the 1993 Annual Meeting. Potential speakers were solicited from the Board. Two outstanding issues remain from 1991. First, a reduced student membership fee (without Journal) is strongly recommended and may increase student membership. This will be raised at the AGM. Second, increasing the number and type of scholarships and other awards, such as travel grants to attend annual meetings, deserves more attention.

J. Soroka suggested that a line be put on registration forms to indicate a willingness to share a room.

Action: Annual Meeting Committee

9.2.23 Pest Management Policy Committee

The completed document is available; however, some outstanding issues remain. The purpose of the document is unclear although the Committee made some recommendations for policy directions. The final format for the publication needs to be determined. Some reviewers felt that a technical review was appropriate while others felt that the document should be written for a more general (but educated) audience. Controversy over pesticide usage prevented consensus and Chair L. Gilkeson recommended that the document stand as a discussion rather than policy paper. Fates for the document may include:

a) acceptance and use as background and lobbying material as required,

b) revise with specific Canadian examples of IPM programs and mention of Canadian researchers and institutions that have played key roles in developing IPM in Canada, or

c) reject and abandon the project or strike a new committee with clear terms of reference.

L. Gilkeson moved and D. Coderre seconded that the paper be published as background and lobbying material. This item was deferred to the meeting of the new Governing Board (September 30, 1992).

9.2.24 Diseases and Pests of Vegetable Crops in Canada Committee

The book project which began in 1986 will conclude in 1993 with English (n=8k copies) and French (n=3k copies) printings. The Committee's report summarized progress in 1992 including choice of printer, development of a book marketing strategy, printing of a promotional flier and poster, translation and editing of the French version, and revision of schedules. The first run of the English version and shipping of book orders on hand will be in January 1993.

9.2.25 Insect Transmission of Plant Diseases Committee

An early draft of the brief titled "Status of Entomological Research on Insect-Transmitted Plant Diseases in Canada" was inadvertently published in the March 1992 *Bulletin*. A final version of the brief will be reprinted in the *Bulletin* as a special insert and will list the members of the Committee. The Society will pay publishing and reprint costs.

Action: G. Boiteau and F. Hunter

9.2.26 Directors from Affiliates

Reports from the Directors of all the Affiliate Societies were received. Presentations were made by: R. Ring for B. Vernon (ESBC), A. McClay (ESA), J. Soroka (ESS), P. Fields (ESM), P. Kevan (ESO), D. Coderre (SEQ) and J. Sweeney (AES).

The Board was encouraged by the numerous ways in which the Affiliated Societies promoted entomology in 1992. Highlights included: funding for aids to teach entomology in elementary schools in B.C., updating an insect collector's guide in Alberta, presentations in classrooms, agricultural and hobby shows and establishing an ad hoc committee to develop a policy on insect 'rights' in Saskatchewan, preparing an Insect Activity Booklet and a Society Newsletter in Manitoba, an electronic bulletin board in Ontario, a question and answer booklet and a publication on endangered species in Quebec, and the establishment of a prize for the best entomology-oriented science fair project in the Atlantic Provinces and Maine.

R. Ring suggested that insect rights be addressed by the Science Policy Committee.

Action: Science Policy Committee

Rooms under the possession of the ESC are now available to entomologists visiting the University of Guelph.

The Biodome (the old velodrome) in Montreal has 4 biomes in use. Lots of insect problems!

9.2.27 Canadian Federation of Biological Societies

9.2.27.1-3Board of Governors, Science Policy and Program Committee

J.N. McNeil is now the Vice President of the CFBS. CFBS is supporting the bill to extend the term of patent rights to drug companies and is promoting the direction of profits towards basic science. A report is out on what reporters think is "news". A large roster of Canadian scientists willing to speak in schools has been put out. Another media seminar is planned for the next meeting in Windsor. A workshop in Science Policy and research in Canada is planned for November. 4% was the increase given to federal granting agencies this year, probably as a result of lobbying efforts. Long-term ecological research is being lobbied for. Cost for lobbying would be the same whether or not there were individual members from the ESC. The federal government wants to maximize its contributions to research with input from the CFBS. CFBS is fighting cuts to federal research programs.

Arguments for membership in the CFBS will be presented by Ian Smith and Jeremy McNeil during the next year. J. McNeil has asked Clement Gauthier to list accomplishments of the CFBS of the past 3 years.

An interpretation of CFBS accomplishments (list of deliverables) relevant to entomology is needed to sell CFBS to ESC members.

9.2.27.4 Archives Committee

No report.

No action required

9.2.27.5 Vote to Continue ESC Affiliation

F. Hunter suggested that the vote be a mailed ballot and that the *Bulletin* be the forum for the debate on whether or not to continue CFBS membership and that the discussion start in the March 1993 issue of the *Bulletin*. B. Foottit suggested that several options be presented to the members regarding partial subsidy of CFBS. The Executive Council will develop a policy regarding the vote to continue ESC affiliation with the CFBS and request feedback from members at the AGM. Regional Directors will request feedback from their members.

Action: Executive Council, Regional Directors, J. McNeil, F. Hunter

9.3 Other Business

There was no other business.

10. Next Meeting

The next meeting of the Governing Board will be held at the Delta Bessborough at 1200 hours on September 30, 1992.

11. Adjournment

President R. Ring adjourned the meeting at 1730 hours, September 26, 1992, following a motion by P. Kevan.

MINUTES

42nd Annual General Meeting
Delta Bessborough
Saskatoon, Saskatchewan
September 29, 1992

President R. Ring called the Meeting to order at 1645 hours. Fifty-four members were present.

1. Notice of Meeting

Notices of the meeting were published in the March & June 1992 issues of the *Bulletin* (Vol. 24).

2. Proxies

R. Ring for B. Vernon.

3. Additions to the Agenda and Approval of the Agenda

There were no amendments to the agenda. L. Safranyik moved and G. Boivin seconded that the agenda be accepted.

Carried **No action required**

4. Deceased Members of the Entomological Community

A moment of silence was observed in memory of the following members of the Entomological Community who passed away since the last annual meeeting: Doug Miller, Tom Silvers, Jim Short, Mike Timonin, Bill Mason, Bessie Robinson, Floyd Eves, Elizabeth Arnason, Mukul Mukerji, Audrey

McDonald, Nancy Morrison and Barbara Brooks.

5. Minutes of the 41st Annual General Meeting

Minutes of the 41st Annual General Meeting were printed in the December 1991 issue of the *Bulletin* (Vol. 23).

K. MacKenzie moved and D. Coderre seconded that the minutes signed by the President and First Vice-President be accepted.

Carried **No action required**

6. Business Arising from the Minutes

6.1 Resolution in Support of Research in Systematics (Item 13.2, Annual General Meeting, October 22, 1991).

President Ring reported that he received 12 replies to 32 letters sent out regarding the ESC Resolution on Systematics made at last year's Annual General Meeting. Several thoughtful responses were received and included those by the President of the University of Guelph, Science Minister W. Winegard, Agriculture Minister B. McKnight and Fisheries Minister J. Crosbie. Dr. David Suzuki, another respondent, felt that the resolution could have been stronger and that it should have gone beyond protecting what he regarded were just the narrow research interests of entomologists.

7. Report from Governing Board

President Ring presented a report on behalf of the Governing Board. The report from the Governing Board and regular updates of the involvement of the ESC with the CFBS are published in the *Bulletin*. Progress on the Insect Common Names List and the ESC/CPS book was outlined. The deficit of the ESC was identified and actions taken to redress this situation summarized. Members were advised that a 'cost-benefit' analysis of CFBS membership will be undertaken and published in the *Bulletin*, and that opportunities will be made to allow for a healthy debate on the subject of continued membership.

J. McNeil moved and G. Boivin seconded that the President's Report be accepted.

Carried **No action required**

7.1 Changes to Standing Rules

7.1.1 Establishment of Marketing Committee

D. Quiring suggested that an *Ad hoc* Committee rather than a Continuing Committee be established to develop marketing and fund-raising strategies for the Society. This would not necessitate any changes to the Standing Rules. A change in status from 'Ad hoc' to 'Continuing' will be reviewed following one year's activity. If a change in status is recommended the Standing Rules will be amended as necessary.

No action required

7.1.2 Reduction of Student Membership Fees

D. Quiring moved and D. Coderre seconded that the following changes to Standing Rule II.2 be made:

> Annual dues for Student Membership shall be twenty dollars ($20.00) with option of receiving the *Memoirs* at no extra cost (1 January 1993). Student Members, shall upon request, receive *The Canadian Entomologist* for twenty dollars ($20.00).

Carried **Action: D. Quiring**

7.1.3 Subscription Fee for *Bulletin* (Emeritus Members)

D. Quiring moved and J. Shorthouse seconded that the following new rule, Standing Rule II.5, be accepted:

Emeritus Members, shall upon request, receive the *Bulletin* of the Entomological Society for twenty dollars ($20.00).

Carried **Action: D. Quiring**

8. Auditor's Report

R.G. Foottit presented the Auditor's Report for 1991 as published in the June 1992 issue of the *Bulletin.*

B. Foottit moved and E. Becker seconded that the Auditor's report be accepted.

Carried **No action required**

9. Elections Committee Report

R. West read the Elections Committee report. Those elected were:

Second Vice-President:	Dr. Les Safranyik
Directors-at-Large:	Dr. Sandy Smith
	Dr. Hugh Danks
Fellowships Selection Committee:	Dr. Doug Eidt
	Dr. Ed Becker

10. Installation of Officers

The President called on J.E. Laing, retiring Past-President to escort L. Safranyik, Second Vice-President to the dias. President Ring turned the gavel over to P.W. Riegert as incoming President of the Entomological Society of Canada. The new President accepted the gavel and thanked the Members for the honour of being President.

11. Presentation of Service Award

President Riegert thanked R. Ring, outgoing President for his service to the Society and presented him with a service award.

12. Appointment of Auditor

R.G. Foottit moved and J.E. McNeil seconded that McCay, Duff, and Company be retained as Auditors for 1992.

Carried **Action: Treasurer**

13. Resolutions

At the request of President Riegert, H.V. Danks presented the following resolutions on behalf of the Entomological Society of Canada:

Thanks to organizing committee

"Whereas the 1992 Joint Annual Meeting of the Entomological Society of Canada and the Entomological Society of Saskatchewan have met at the Delta Bessborough in Saskatoon, Saskatchewan, September 27-30, 1992; and

Whereas there has been a full and interesting meeting of lectures, symposia, and papers; and

Whereas the program has been planned with care and concern for those attending; and

Whereas there has been ample opportunity provided for social interaction, and visits to Saskatoon and vicinity;

Be it resolved that the Entomological Society of Canada and the Entomologial Society of Saskatchewan express their sincere thanks to the Organizing Committee for their hard work and skill in arranging a most worthwhile and entertaining program; and

Be it further resolved that the two Societies thank the Organizing Committee and meeting contributors for their generous assistance; and

Be it further resolved that the two Societies express their thanks to the Management and Staff of the Delta Bessborough for their courteous assistance during the Meeting."

H.V. Danks moved and L. Gilkeson seconded that the resolution be accepted.

Carried **Action: Secretary**

Newfoundland Insectarium

The following resolution on behalf of the Newfoundland Insectarium was presented:

Whereas the promotion of entomology in schools and other institutions, and the enhancement of public understanding and appreciation of insects and other arthropods, are essential for the well being of entomology;

Be it resolved that the Entomological Society of Canada endorses development of the Newfoundland Insectarium, and recognizes the importance of the Insectarium for the advancement of entomology in the Province of Newfoundland and Labrador.

H.V. Danks moved and J.E. Laing seconded that the resolution be accepted.

Carried **Action: Secretary**

14. New Business
There was no new business.

15. Notice of 43nd Annual General Meeting
The 43nd Annual General Meeting will be held at the Watertower Inn, Sault Ste. Marie, Ontario on September 28, 1993. Further notices for the meeting will be made in the March and June issues of the Bulletin (Vol. 25).

Action: Secretary

16. Adjournment
President P.W. Riegert adjourned the 42nd Annual General Meeting at 1725 h following a motion by B. Foottit.

photo by J. Soroka

Governing Board of the Entomological Society of Canada (September 26, 1992)

Back row, left to right: J. Laing, P. Fields, A, McClay, L. Safranyik, J. Sweeney, K. Richards, D. Coderre, G. Boivin; Middle row: R. Foottit, R. West, F. Hunter, L. Gilkeson, K. MacKenzie, A. Ewen, H. Danks, P. Kevan, S. Marshall; Front row: R. Ring, P. Riegert, G. Gerber, D. Quiring, S. Smith, J. Turgeon.

MINUTES - Governing Board Meeting
Delta Bessborough, Saskatoon, Saskatchewan
September 30, 1992

The meeting was called to order at 1210 hours on September 30, 1992 by President P.W. Riegert. Those present were P.W. Riegert, President; R. Ring, Past-President; G.H. Gerber, First Vice-President; L. Safranyik, Second Vice-President; K.W. Richards, G. Boivin, S.A. Marshall, J. Turgeon, S. Smith and H. Danks, Directors-at-Large; P. Fields (ESM), P.G. Kevan (ESO), D. Coderre (SEQ), and J. Sweeney (AES), Directors from Affiliate Societies; R. West, Secretary; R.G. Foottit, Treasurer; A. Ewen, Editor, *The Canadian Entomologist*; and F.F. Hunter, *Bulletin* Editor.

1. Notice of Meeting

Notice of this meeting was mailed on July 27, 1992. Notices were published in the March and June 1992 issues of the *Bulletin* (Vol. 24).

2. Absences and Proxies

2.1 Absences

B. Vernon, A. McClay, V. Behan-Pelletier, K. MacKenzie.

2.2 Proxies

R. Ring for B. Vernon.

3. Additions to Agenda and Approval to the Agenda

Add Item 7.2 *Ad hoc* Committee on biological control regulation.
7.3 Kevan Award
7.4 Pest Management Alternatives Office

D. Coderre moved and J. Turgeon seconded that the Agenda as amended be accepted.
Carried **No action required**

4. Minutes of Previous Governing Board Meeting

K. Richard moved and G. Gerber seconded that the Minutes of the Governing Board Meeting held on September 26, 1992 as circulated by the Secretary be received.
Carried **No action required**

5. Business Arising from Previous Governing Board Meeting

5.1 Discussion paper on pest management policy (Item 9.2.23, Governing Board meeting, September 26, 1992)

P. Fields moved and J. Sweeney seconded that the recommendations of the Ad hoc Committee on Pest Management Policy be accepted as a policy of the Society.
Carried **Action: Science Policy Commitee**

The Board directed L. Gilkeson to write an abbreviated version of the report with the 5 recommendations for publication in the *Bulletin*.
Action: G. Gerber, L. Gilkeson

6. New Business

6.1 Appointments

6.1.1. Executive Council

P. Riegert moved and G. Gerber seconded that the Executive Council for 1992-93 be: P.W. Riegert, President; R. Ring, Past-President; G.H. Gerber, First Vice-President; and L. Safranyik, Second Vice-President.
Carried **No action required**

6.1.2. Trustees

P. Riegert moved and J. Sweeney seconded that the Trustees for 1992-93 be: R.G. Foottit, Treasurer; A.B. Ewen, Scientific Editor; V. Behan-Pelletier, Scientific Editor (*Memoirs*); C.H. Craig and R.H. Elliot, Assistant Scientific Editors; F. Hunter, *Bulletin* Editor; and R.J. West, Secretary.
Carried **No action required**

6.1.3. Committees and Representatives

P.W. Riegert moved and G. Boivin seconded that the Governing Board approve the list of Committees and Representatives as prepared by the President and further that the Governing Board accept the President's appointees to remaining positions to be filled.
Carried **Action: P.W. Riegert**

The Secretary will send terms of reference to all new Committee Chairs upon receipt of the list of new appointments made by the President. New Ad hoc committees will address biocontrol

regulations, marketing and fund-raising, and the review of the status and study of pollinating insects in Canada.

Carried **Action: P.W. Riegert, R. West**

6.2 Budget

K. Richards moved and G. Gerber seconded that the budget for 1993 as amended by the Treasurer be approved.

Carried **Action: Treasurer**

7. Other Business

7.1 Ad hoc Committee to promote systematics research in Canada.

In response to Dr. Glenn Wiggins' Gold Medal Address identifying a need for scientists to promote systematics research in Canada, S.A. Marshall moved and G. Gerber seconded that an Ad hoc Committee reporting through the Science Policy Committee be struck to promote systematics research in Canada by providing proposals for action following consultation with governments, universities and industry.

Carried **Action: S.A. Marshall**

S.A. Marshall will contact Dr. Wiggins regarding the formation of the new Committee.

Action: S.A.Marshall, Science Policy Committee

7.2 Ad hoc Committee on biological control regulation

J. Soroka moved and K. Richards seconded that an Ad hoc Committee be struck to address the regulation of biological control agents in Canada. The new committee will develop recommendations and advise Agriculture Canada regulators through the Science Policy Committee.

Carried **Action: J. Soroka, P. Riegert**

7.3 Kevan Award

P. Fields will form a sub-committee of the Scholarships Committee to develop terms and conditions of the Kevan Award and report to the Board. A report of this sub-committee will be presented at the next meeting of the Executive Council.

Action: P. Fields, Executive Council

7.4 ESC representation on Board of Directors of Pest Management Alternatives Office

G. Gerber indicated that the Society was requested by S. Hill to have representation on the Board of Directors of Pest Management Alternatives Office which is supported under a Green Plan Initiative of Agriculture Canada. G. Gerber suggested that a letter be written to the Executive of the PMAO asking that the ESC be represented on its Board of Directors.

Action: P. W. Riegert, G. Gerber

8. Next Meeting

The next meeting of the Governing Board will be held on September 25, 1993 beginning at 0900 hours at the Watertower Inn, Sault Ste. Marie, Ontario. If necessary the meeting will continue on September 26.

9. Adjournment

The meeting was adjourned by President P.W. Riegert at 1320 hours following a motion by P. Kevan.

ARTICLES

WHO SPEAKS FOR SYSTEMATIC BIOLOGY IN CANADA?

Gold Medal Address to the Entomological Society of Canada
28th September 1992, Saskatoon
by

GLENN B. WIGGINS
Department of Entomology, Royal Ontario Museum
and Department of Zoology, University of Toronto
100 Queen's Park, Toronto, Ontario, Canada M5S 2C6

I have first to convey my sincere appreciation to the Entomological Society of Canada for the Gold Medal for 1992. To be judged worthy of joining the group of scientists who have received the Society's award for achievement is profoundly rewarding.

The ideas that I have chosen to share with you today concern the future of systematic biology in Canada, and in particular, systematic entomology. Systematic entomology, like all other sectors of systematic biology is everywhere in decline. Since insects and other arthropods have a great deal to do with the movement of energy and nutrients within terrestrial ecosystems, and include our most serious competitors for food and forest products, we might have predicted that support for systematic entomology would now be, at the very least, stable. We might have predicted that it would be deemed important for science to pursue exploration of the animals that even now constitute more than 80% of all living species, but whose total number can still only be estimated vaguely at somewhere between 3 and 30 million species or even more. We might have predicted also that a high scientific priority would be placed on the fundamental question of why the terrestrial ecosystems of this planet support so many species of arthropods. But, as events have proven, we would have been mistaken.

Much of what I shall have to say hinges on a simple concept: taxonomy and systematics are not the same. Taxonomy is concerned with the diagnosis and naming of species and their placement in the hierarchic classification of biology. Systematics includes taxonomy, but it also includes phylogeny — the study of evolutionary relationships and the reconstruction of evolutionary history. Hypotheses of evolutionary history are neither trivial nor esoteric because, as Theodosius Dobzhansky observed many years ago, biology deprived of its evolutionary context, makes little sense at any level. Therefore, systematic biology comprises taxonomy and phylogeny. Systematists have this distinction clearly in focus; but to most other members of the scientific community, taxonomy and systematics are synonymous.

In groups of lower diversity where the taxonomy is relatively well known, as in many vertebrate taxa, intensive phylogenetic analysis can be undertaken through studies at a molecular level; but these methods are costly and therefore not widely utilized. In highly diverse groups such as insects and other terrestrial arthropods, the fundamental task is taxonomy — exploring biotas and establishing diagnoses and names for species in order that they can be recognized and facilitate other studies such as community ecology. Phylogeny is by no means irrelevant in biodiversity studies, but recognizing species of organisms is of practical importance, and all the more so for the vast number of insects and other invertebrates still wholly unknown to science. Research on these taxonomic aspects of systematics

underlies the sustainable development and conservation of natural ecosystems. To link conservation with economic development, it is important to understand the composition and function of the ecosystems involved. Although most systematists rationalize their work in terms of comprehending global biodiversity, the problem in Canada is that taxonomic and inventory work in biodiversity studies has little stature in the NSERC system, and there is no alternative federal agency where this kind of research is encouraged or funded for universities and museums.

In Canada, the Natural Sciences and Engineering Research Council provides funds for research and equipment in universities; museums are not eligible for NSERC support, and museum staff are eligible only if individual members are cross-appointed to the academic faculty of a university, but then usually only to the extent of support for research of graduate students. Moreover, there is no specific program for systematic biology in NSERC; all research proposals in systematics are directed to the Evolution and Ecology Grant Selection Committee, where they constitute about 20 per cent of the total received by that Committee. Because of the large number of biological disciplines served by the Evolution & Ecology GSC, not more than 20% of the panel members are likely to be systematists — which ought to mean two of the Committee's 10 to 12 members. To compete successfully in the NSERC system, applicants are expected to frame their research within some general scientific problem. For systematists applying to the Evolution and Ecology GSC, that means an evolutionary problem — leading to emphasis on phylogenetic aspects of an applicant's research. Taxonomy and faunistic or floristic work in isolation are not encouraged.

On this topic, I will add that systematists often do themselves no favour in the preparation of their research proposals for the NSERC Committee. The time-honoured approach in systematics of "revising the genus because it has never been done" is no asset to an NSERC application because the evolutionary framework is lacking. Increasing the understanding of evolutionary relationships among taxa is a significant biological advance, and the consequent changes in taxonomy and classification enhance the expression of those relationships in the predictive superstructure of biology. Members of the NSERC Grant Selection Committee have to be reminded that systematics lies at the crossroads of research in evolutionary biology because taxonomy is the initial phase of science for exploring biological diversity; and because phylogeny projects biological diversity on an evolutionary framework. Moreover, there is little indication that NSERC is concerned about the demise of systematic biology in Canadian universities; and biodiversity, even without a crisis, has yet to become part of the NSERC lexicon. This void in Canada co-exists with recent statements of deep concern about the loss of biological diversity from the U.S. National Academy of Sciences and the Royal Society of London. The Royal Society of Canada has had little to say on the issue of biodiversity.

It will be clear, then, that there is a desperate need for more vigorous support for systematic biology in museums and universities in Canada. Just now, however, one new initiative is under way. A Consortium is being formed to enhance co-operation in systematic biology at the federal level by the three principal practitioners: the Biological Resources Division (formerly Biosystematics Research Centre) of Agriculture Canada; Forestry Canada; and the Canadian Museum of Nature. This may prove to be a truly significant initiative, and those responsible are to be commended. Synergistic interactions among these institutions could lead to more efficient use of existing resources for systematic biology in this country. One principal achievement of a more unified voice ought to be a wider appreciation by agencies of government that systematic biology is an important part of science in Canada.

However, rationalization of existing resources does not address what to my mind is the root of the problem — that no sector of government speaks for systematic biology in Canada. Review the support

for systematic biology that we now have in this country. A large part of the funds provided by the federal government for systematic biology is directed to Agriculture Canada for systematic studies of arthropods and plants; but the Biological Resources Division has now been advised that its work in systematics is to be more closely related to the needs of the agri-food sector. And the future of the Canadian National Collection of Insects, one of the world's major research collections, is to be guided by the recommendation that long-range support for collections of insects that are not significant to Canadian agriculture is to be sought from external sponsors. Funds dispensed by NSERC for research in science are available for systematics, but in competition with all other sectors of biological science, and only to universities; taxonomic work, by itself, is not encouraged. Museums are the traditional home of systematic biology, but museums in Canada have been largely fixed in the public mind, and therefore in the priorities of governments, as institutions for exhibition and popular education. Moreover, most museums in Canada are seen by the government agencies responsible for them as cultural institutions, with all the political paraphernalia that goes with the word *cultural* in Canada. This is no minor issue, for if cultural affairs become largely provincial responsibilities, as proposed in the current constitutional negotiations, provincial museums could find even tougher sledding in demonstrating a national role in any sector of science under their present cultural banner, and inevitably their programs in systematic biology would suffer further cuts. Thus, museums in Canada are not well placed to direct a significantly larger share of their institutional budgets into systematic biology.

Compare this situation in Canada with the system in the United States where the National Science Foundation has a specific funding program for systematic biology. Systematists in universities, and also in museums that have no university affiliation, are eligible for research funds; and museums are eligible for infrastructure grants to improve facilities for research collections. Recently, new funds were made available specifically for biotic surveys. Moreover, funds from the U.S. Agency for International Development and similar agencies are more accessible for biodiversity inventory projects than are comparable funds in Canada.

This contrast is troubling, and leads me to believe that the status of systematic biology in Canadian science is seriously flawed. Whatever the reason, it is clear that the systematics community in Canada has not connected effectively with decision makers in government. I am convinced that the fundamental challenge in Canada is for systematic biology to be re-defined for government at all levels as a scientific activity highly relevant to the biodiversity issues of this country and beyond. The science of biodiversity is systematic biology. Systematic biology is more than an academic pursuit; it is a requirement for living in the finite world of today, and for preparing for tomorrow. It warrants support from public funds accordingly.

The paradox here is that Canadians are genuinely concerned about declining biodiversity, as indicated by numerous polls of public opinion; but governments responsible for dispensing public funds have failed to maintain the sector of science that provides much of the basic information about biodiversity — systematic biology. Governments have failed to recognize that protecting natural ecosystems requires an understanding of the ecological interdependence among the species constituting their biological communities; for without robust communities, the ecosystem deteriorates. It will be clear that additional funding must be allocated if systematic biology in Canada is to contribute to the biological data base of this country and of other parts of the world. Experience shows, however, that agencies of government at either federal or provincial levels, despite all efforts to increase their own budgets in support of systematic biology, have not altered the recent declining trend in the allocation of funds by government.

Therefore, to meet this challenge I propose that together with the new institutional Consortium for systematic biology, there be a second initiative from the professional societies in Canada representing the disciplines involved. A Consortium of institutions is appropriate to rationalize present resources in systematics; but an alliance of the relevant professional scientific societies in Canada is uniquely placed to call for a fundamental reformation in the status and funding of systematic biology in this country. Envisaged here is nothing less than an all-out effort to achieve a renaissance for systematic biology in Canada; this would be a major campaign demanding commitment and careful planning. Previous experience indicates that an initiative from the societies would be constructive. When the Entomological Society introduced the Biological Survey of Canada, it spoke as a professional society advocating a new direction to meet Canada's growing need for more information about the neglected arthropod fauna of the country. Indeed, the federal government has encouraged professional societies to take such initiatives. In large part, financial support was contracted for a Pilot Study to test the Biological Survey concept because the project was advanced in the name of the Entomological Society of Canada.

I believe that the Entomological Society has now a similar seminal role in the re-formation of the support system for systematic biology in Canada. This follows partly from the fact that terrestrial arthropods constitute the largest part of the unknown animals of Canada and of all other countries; but it follows also from the fact that the Entomological Society of Canada has a record for foresight and organizational ability in taking the lead in Canada for matters of broad biological importance.

These facts of life in Canadian science raise in my mind the need for a new strategy of offense by the community of systematic biologists in this country. Complaining and waiting for responses that do not come have to be replaced by an offensive that carries specific arguments to designated officials. Fundamental to the offensive must be the case for systematic biology — logical and forceful — showing how this field of science underlies and contributes to understanding and conserving the natural world.

I propose that the Entomological Society of Canada, in communication with the institutional Consortium, initiate the role for professional societies by drawing up a national plan with a realistic budget for the resuscitation of systematic entomology throughout Canada. That plan should be formulated to maintain the infrastructure required to achieve an understanding of arthropod biodiversity in Canada, and to contribute to that understanding elsewhere in the world. The plan should be realistic in seeking mainly to validate and upgrade existing resources at both federal and provincial levels. Costs for additional staff and for improving research collections in national and regional institutions should be closely estimated. Museums and universities could be eligible for some form of supplementary grants to the extent that they themselves have established programs in systematic entomology. Professional societies representing other disciplines could become involved whenever they put the initiative and requisite organization in place, to join in alliance with the Entomological Society in developing a plan to reform the foundation of systematic biology in Canada, enabling it to become a more vigorous part of biological science now and into the 21st century.

In seeking increased funding for work on biodiversity, systematists should be prepared to place renewed emphasis on taxonomic aspects of their research. This kind of information is most accessible in the form of keys and diagnostic outlines for particular groups in regional faunal and floral references. A national plan could provide contracts for systematists to produce these works for groups of particular importance; this would provide substantive encouragement for younger systematists who do not have a permanent position, and would be at the same time a cost-effective means of generating some of the reference works required.

Armed with a broad national plan supported by a realistic budget, the alliance of professional societies would have to find the appropriate receptor within government. Since no responsibility for systematic biology throughout the country appears to exist, government will have to be encouraged to correct that deficiency by being educated to understand that the biodiversity issue can only become larger. In June, 1992, the Prime Minister of Canada was a signatory to the Biodiversity Treaty in Rio de Janeiro, committing this country to support a world effort for conserving biodiversity; consequently the government of Canada has to be prepared to reinforce its own national resources for the science of biodiversity. The alliance of professional societies should be prepared to press this case at the highest level of government as an issue of urgent importance. Above all, this initiative should not be a lobby for more support for yet another sector of science; systematic biology is uniquely placed to contribute to a grave environmental issue — but cannot do so under methods of financial support now operating in Canada.

The Entomological Society of Canada already has some items for a national plan for systematic biology in this country. For example, in its brief on the importance of research collections of terrestrial arthropods (1991), the Biological Survey recommended that a national plan be formulated for the support of all systematic collections, and that an allocation of funds for dispensation be added to the annual budget of the Canadian Museum of Nature. No response to this recommendation has been received. And in the Pilot Study for the Biological Survey (1978), a recommendation was made for support of regional centres in various parts of the country for a renewed program of faunistic and systematic entomology in Canada. No response has been made to that proposal, either. The reason for this lack of response is clear enough: no sector of the federal government has been made responsible for systematic biology at a national level.

At a recent meeting concerned with the future for systematic biology in Canada, a prominent member of the museum community challenged the participants: When systematists request funding for their branch of science, can they be certain, he asked, that their research is more important in the scale of national priorities than hospitals or aid to the elderly? Why would a spokesperson for any sector of science in Canada relate its need for support to the inviolable dollars of government spending? Why not relate the needs of systematic biology to the cost of military helicopters? With some $3 billion a year, the Department of Defence is purported to have the largest single procurement budget in Canada, amounting to half of all federal government contracts. Canada proposes to spend $22 million over the next 5 years as part of an international project on the human genome. Then there are retirement benefits for appointed senators. Surely there is a multitude of other sectors of government expenditure where research on biodiversity can compete successfully, because at stake is understanding and conserving the natural ecosystems of this planet, concerns of no small importance to the human species. From this experience, I gather that the community of systematic biologists in Canada need be highly circumspect in identifying the sector of the federal government to be targeted for reforming the support structure for systematic biology in Canada; and be circumspect as well in the message that is transmitted.

In the present economic circumstances, we would deceive ourselves if we thought that additional funding from government would be readily forthcoming; and so I suggest that private funding be sought in partnership with new support from government. Biodiversity is destined to become even more important than motherhood in public priorities, and consequently could be an attractive investment in public relations for corporations. Some form of corporate tax credit for dollars invested in biodiversity programs seems a reasonable incentive. Imagine, for example, an Imperial Oil curatorship in insect biodiversity at the Provincial Museum of Alberta, or a Cyanamid curatorial chair at the University of Guelph. A fantasy? Perhaps; but the world is changing in many ways and change begets new, sometimes startling, solutions. That single word, *biodiversity*, has come to encapsulate the deepening concern about

the impact of the human species in degrading the world to a place where fewer and fewer organisms of all kinds can live. Why not try to re-shape the future of systematic entomology in Canada to meet this problem?

Are these proposals likely to lead to remedial action? Who can predict? But they could lead to a reasonable program put forth in the national interest by societies of professional scientists, which no responsible official could ignore. The main deficiency right now is that no national plan exists — there is no strategic plan with a realistic budget to present to governments and industries in Canada. For Entomology, declining biodiversity and biological control of pest species are focal issues for public funding; and both depend on vast improvements in the systematic base. No profession is better equipped to formulate and advance these issues than is Entomology itself; and in this country that comes down to the Entomological Society of Canada.

Let me say, in conclusion, that I value my association with this Society because over many years its members have demonstrated a high level of professional responsibility and initiative. Although it is not a large organization, the Entomological Society of Canada has contributed substantially and disproportionately to biological science. Publication of *The Canadian Entomologist* for well over a century, strengthening the standards of this reputable international scientific journal and expanding it to include the *Memoirs* series, are marks of professional integrity. Briefs that have appeared periodically over many years as inserts in the Society's *Bulletin* are responsible professional commentaries on entomological issues of wide concern. The Biological Survey of Canada was entirely an initiative of this Society, setting an example for other biological disciplines in Canada, and one admired in other countries. The Entomological Society of Canada has a long and substantial heritage, deserving of much satisfaction from its members. For all of these reasons, and for others too, I value deeply the honour you have given me today.

THE ENTOMOLOGICAL SOCIETY OF SASKATCHEWAN 40 YEARS AND COUNTING

The Heritage Lecture to the Entomological Society of Canada
28 September 1992, Saskatoon, Saskatchewan
by

PAUL W. RIEGERT
Department of Biology, University of Regina

1952! The year dawned with a promise on its face and with vigour in its stride. Entomology was flourishing in Canada as its more than 600 entomologists looked to the future with confidence and conviction.

The Entomological Society of Canada had just emerged from its cocoon, the progenitorial Entomological Society of Ontario, and was surging ahead after its first year of renewed life. All manner of sub-disciplines of entomology had been spawned after World War II and few could keep pace with, or fully understand the myriad facets of new information that were bursting forth from all parts of Canada. There were entomologists who were physiologists, and ecologists, and taxonomists, and toxicologists, and a whole host of other "..ists" that vied for a place in the entomological sun. Every scientist was

embarked on an intriguing path of inquiry and had a new story to tell. But was there someone near at hand to whom he or she could tell their story? And how, by what means, should it be told?

Dr. **Arni P. Arnason**, the then Head of the Dominion Entomological Laboratory at Saskatoon, Saskatchewan, had just returned from Ottawa, where the first Annual Meeting of the Entomological Society of Canada had been held at the Chateau Laurier. He came back with intriguing tales of the wonderous things that were happening in entomology in Canada; some with ominous overtones. DDT was still riding high but storm clouds of doubt concerning its long-term effects on the environment, were looming on the horizon and casting their long shadows to obscure some of the new insecticide's brilliant successes. **Jimmy Marshall** was having the time of his life fighting the codling moth in British Columbia. **Frank Morris** was knee deep in the Green River Project, the first comprehensive Canadian entomological program to wring ecological and biological information out of a noxious insect pest, the spruce budworm. **Cecil Twinn** was straw-bossing investigations of mosquito and black fly control in northern Canada. **George Holland** was supervising the identification and assessment of the importance of a million or more northern insects added to the Canadian National Collection. **Gordon Hobbs** was sky rocketing to fame with the successes he experienced when he introduced into Canada and managed the breeding of leafcutter bees as pollinators of alfalfa. There were stories of entomological successes emerging from every laboratory and field station in the Dominion.

Much of the entomological work had trans-Canada implications. It was imperative that all entomologists be informed of what was happening in their particular field of endeavour, as well as in the science of entomology generally. It meant that all entomologists had to talk to one another, to get together more often and discuss their work and plans for the future. The Entomological Society of Canada had led the way, ever since it was formulated in 1862 and founded a year later on the premise of an interchange of ideas and knowledge. Ninety years later (1952) the Society needed direct input from individuals and entomological groups from across Canada because the problems, and the answers were too complex for any one individual or group to solve alone.

This was not only necessary from a cross-Canada point of view, but it also meant that local workers needed a forum, a place and a time to discuss their research projects with their local brethern. It was time to form a Society in each region of the country to sift and refine data so that the final product would be acceptable and palatable to all, and most importantly, become known to all.

When **Arnason** indicated that the Entomological Society of Canada needed a representative from each regional Society to help form a Governing Board that would chart the course, he also indicated that Saskatchewan needed a Society to fill that national need. All the entomologists of Saskatchewan were called together on the 8 May 1952, to approve a tentative constitution drafted by **J.C. Arrand**, **R.B. Lowe**, and **W.W.A. Stewart**. When this was given final approval on the 31 May 1952, a new regional Society was born: *The Entomological Society of Saskatchewan.*

Most of the entomologists in attendance were federal scientists in Saskatoon from the Field Crop Insect Unit, the Veterinary-Medical Insect Unit, the Systematics Unit, and the Shelterbelt Insect group of the Forest Insect Unit from Indian Head. Two faculty members from the Department of Biology, University of Saskatchewan, were also included. The University of Regina was not represented for it was yet unborn even though implantation had been accomplished; gestation was slow.

The first executive members of the Society were **L.G. Putnam**, President; **C.E. Brown**, Vice

President; **M.N. MacLeod**, Secretary-Treasurer; and **H.A. McMahon** as the Society's representative on the E.S.C. Board of Directors. The 22 founders of the Society and those who served as President in subsequent years, are listed at the end of this narrative.

The Objectives of the Society were kept to a minimum. Whereas the Entomological Society of Canada, in 1862, stipulated that it would: (a) assemble a collection of Canadian insects, (b) interchange duplicate material, and (c) hold meetings to advance the science; the Entomological Society of Saskatchewan simply stated that it would *"stimulate public awareness of the significance of entomology and co-operate with other societies having similar interests"*.

Having that as its goal, what has the Society accomplished? I could go on and on and present blow by blow, year by year accomplishments as these occurred in chronological order for 40 years from 1952 to 1992. That would be contrary to the constitutional objectives of the Society for it would not "stimulate public awareness" in the right anatomical places as you develop gluteal blisters. Therefore, let me just give you the highlights.

The Annual Meetings

The biannual meetings have been a great success for our members. Usually the site of these meetings has shuttled between the two centres, Saskatoon and Regina. Only once we attempted a mid-way locatioon at Davidson, hoping thereby to increase attendance from both north and south districts. It didn't help attendance! For some unexplicable reason, we normally get more members out to a meeting in Saskatoon. Strange as it may seem the reason for this may be a topographical one, the road to Regina from Saskatoon is uphill, and fewer make the trek to the south than do the down-hillers going north!

Not only have these meetings stimulated the completion and reporting of research projects, it has encouraged dialogue between and among the researchers. Furthermore, they have made it much easier and convenient to know what is occurring, or has occurred in the various departments, laboratories, and research establishments in the many corners of the province. Problems have been addressed more quickly and work initiated more aggressively.

To increase the awareness of entomological work, and to promote greater interaction between entomologists, joint meetings with other Societies were held on several occasions. Meetings were held with the following: the Entomological Society of Canada in 1960, 1968, 1975, 1983, and 1992; the Entomological Society of Alberta in 1967, 1978, and 1980; the Entomological Society of Manitoba in 1985; and the Canadian Botanical Association in 1975. One of the best features of such meetings is the personal contact, the unity of purpose, and the willingness of workers to share their findings and help others.

Awareness of entomology has been the keyword in the past 40 years. This has taken several forms, namely:

(a) Awareness through Participation by Amateurs

The awareness was, first of all, directed towards amateurs in entomology. We had **Ron Hooper**, a Christian pastor from the Qu'Appelle Valley of Saskatchewan and an enthusiastic collector, particularly of Lepidoptera and Coleoptera. How fitting that Ron should join the Society, for it was in keeping, even though not by intent, with the early membership of the Entomological Society of Canada.

Many members of that Society were clergymen and persons of ecclesiastical rank; their contributions to entomology in Canada have been outstanding (viz. C.J.S. Bethune, T.W. Fyles, O. Fournier, l'Abbe Leon Provencher, G.W. Taylor, etc.). Ron has been emminently successful in maintaining the high-profile, clergy-entomologist image, in a vibrant state for our Society in Saskatchewan.

But not to be outdone by one amateur, we have also welcomed **John Kozial** into our midst; a farmer who has one of the best private collections of Lepidoptera in Canada. His enthusiasm, drive, and classical excellence in assembling and curating a private collection of insects, has been a shining example of 'professionalism' that can well be emulated by all of us. His collection is currently on display in the foyer outside this room and can attest to the excellence I have ascribed to it.

In order to assist the amateur entomologists in their work, the Society decided to acquire microscopes for their use. Used instruments were available at the University of Saskatchewan but only via a bidding method that discouraged rather than encouraged their procurement. Therefore, we simply purchased a new binocular instrument. It is available for those who request it but **John Kozial** has, perhaps, made the most use of the instrument. Although **John Kozial** and **Ron Hooper** have been the most productive amateurs of this Society, let us also acknowledge the lesser contributions made by at least a dozen others who were, or still are contributing members.

(b) Awareness through Schools

Ever since its inauguration the Society has tried to get young school children interested in insects. The youngsters make up the most enthusiastic audiences one can find anywhere. We have taken exhibits to schools and shopping malls where collections of local insects always generate interest and many questions. Over the years such displays have been set up in Regina, Saskatoon, and Yorkton. Much of the credit for the success of these projects goes to many individuals; those that come to mind are **John Kozial**, **Lloyd Harris**, **Bruce Neil**, and before them, **Arthur Brooks** and **Maurice Taylor**.

Further public relations projects included the annual informal classroom talks and demonstrations to public school students, Boy Scout and Girl Guide Association meetings. When I did a recent head count of participants, I found that at least 85% of the membership have at one time or another (some repeatedly) taken part in entomological talks, displays, and seminars.

(c) Awareness through Collecting

In 1952, **A.R. Brooks**, the systematist at the Dominion Entomological Laboratory in Saskatoon, was collecting insects from many places on the prairies. His intent was to get to know what insects were common on the flatlands, among the grasses, and on the ranges and sand hills of southern Saskatchewan. He was instrumental in getting members of the Entomological Society of Saskatchewan to make special collecting trips to some of the southern districts, including what is today the National Grasslands Park. Specimens, especially the leafhoppers, were combined with those that **Brooks** had collected, thereby augmenting the Canadian National Collection in Ottawa where most of the specimens were sent. The effort certainly enhanced our knowledge of the insect fauna of Saskatchewan's grasslands.

Shortly after our Society was organized, and for several years thereafter, **A.R. Brooks** and **M.E. Taylor** organized and conducted several field trips to various parts of the province. These were essentially collecting trips supplemented by family outings. Insects collected were added to the general collection now on hand.

In 1987, organized collecting of insects was renewed by members of the Entomological Society of Saskatchewan. The first trip was made in June by 14 members under the leadership of **Lloyd Harris**. Since then several more treks were made into the Grassland Park, normally several times a year. Insects that were collected have accumulated so that at the present time at least six boxes of pinned material are available for study and curating. Most of the insect Orders have been identified but some additional material needs identification and curation. The collection will be presented to the National Grasslands Park as a foundation collection of the insect fauna, and displayed in the interpretive centre of the Park.

In the past five years, another project, led by **Ken Pivnick**, has been gaining momentum. This is the butterfly survey, co-ordinated by the Xerces Society, to promote interest in, and conservation of endangered invertebrate species and their environments. The annual butterfly count, carried out in June each year along lines of the well-known Christmas bird counts, has been a source of interest and cohesion of purpose to members of the Entomological Society of Saskatchewan.

It should be mentioned that much of the work of systematic entomology in Saskatchewan has now fallen on a few individuals. **Art Brooks** is no longer available to pick up an insect and immediately give us the name plus all of its biology and life history. The individuals we now have to fall back on are few in number since systematics is not a prime function of most of our entomologists.

We do acknowledge the services of **Ron Hooper**, who incidentally also works part-time for the Saskatchewan Natural History Museum in Regina, and collects, identifies, and curates the Lepidoptera. Ron has compiled lists of these insects and annually adds occurence records of species in Saskatchewan. He also monitors and collects beetles; there are 299 species of Carabidae in Saskatchewan. (George Ball, take note!) Others who were and are doing work of a systematic nature include **John Kozial**, **Maurice Taylor**, **Ken Pivnik**, **Keith Roney**, and **Carl Lynn**, just to name a few.

(d) Awareness through Student Participation

It was a long-standing desire on the part of members of the Entomological Society of Saskatchewan to award a prize of some sort to deserving students of entomology. Since the parent society (the E.S.C.) was offering several scholarships annually, the Entomological Society of Saskatchewan was in no position to emulate their action because of small numbers of members and a much smaller budget. Various suggestions were made as to how the Society could participate in an awards program but none of these gelled sufficiently to warrant action. Things came to a head when **A.R. Brooks** died in mid-summer of 1962. When **Mrs. Barbara Brooks** indicated that she was prepared to assist in the offering of a prize in entomology in memory of her late husband, the Society immediately took firm and positive action. The *Arthur R. Brooks Memorial Book Prize* was established in 1963, a modest beginning for a small Society but one that has been maintained throughout the years. The first recipient was **Larry Burgess**, now retired from the Canada Agriculture Research Station in Saskatoon. Initially the books prizes (books were selected by the student recipient) were worth about $25.00, whereas in recent years this has escalated to more than $175.00. Even here the negative effects of inflation, G.S.T. and P.S.T. have made an impact on real monetary values. Nevertheless, the books have been appreciated by those who received them. It is sad to relate that **Mrs. Barbara Brooks** died on 29 September 1991. Her support of the Book Prize for so many years has been a constant encouragement for the Society. We will continue to offer the Prize and not allow the momentum given to the project by Barbara, to lag.

(e) Awareness through Education

(i) Curriculum and Classes Insect control had changed over the years, especially that of

chemical control when synthetic insecticides made control easy and effective. When environmental problems arose and resistance in insects appeared widespread, changes had to be made; integrated pest management came to the fore. The Society was worried that many of the agricultural graduates from the University of Saskatchewan were not receiving sufficient grounding in pest control, let alone entomology. In a survey conducted by the Society in 1981 it was learned that in the last 11 years (1970-1981), only one percent of 972 B.S.A. graduate students had taken a course a entomology. That was deemed insufficent, especially for those who proceeded to be extension specialists.

The Society was determined to include entomology in specified options within the B.S.A. program. Submissions were made to the College of Agriculture to revise the curricula accordingly. The appeal, led initially by **A.P. Arthur** and **A.B. Ewen**, wound up through the heirarchy of innumerable Committees, Departments, Colleges, and the Senate of the University of Saskatchewan. Entomology has now been adopted as an option in the horticulture program; others are pending. In 1991, **George Khachatourians** reported that two more classes in entomology (microbial insecticides) would be offered to bolster the four that are currently offered by the Department of Biology. It has been a slow struggle to get more recognition for entomology, some progress has been made but it is not enough. The struggle will continue.

(ii) Slide Library In 1985, **Lloyd Harris** proposed that the Society assemble a series of slides of Saskatchewan insects, these to be assembled from material donated by Society members, duplicated, and offered for sale. The proceeeds of such sales would go to augment the finances of the Society. In two and a half years, i.e. by August 1988, after approval was given to proceed with the project, the sales of slides amounted to more than $700.00. These had been sold, usually in packages or lots which the customer selected from more than 500 slides that members had donated and were made available for duplication.

Not only was it a profitable exercise for the Society, it was a service provided to libraries, schools, government agencies, and Universities to enhance their educational and public relations programs. Needless to say the whole exercise was a unifying experience for entomologists in the province. Not only were members forced to think of and actively find the important insects, be they of economic or artistic value, but it allowed for discussion, interaction, and evaluation of the impact entomology had on the people, their lives, and the economy generally.

(f) Awareness through Publication

As early as 1973, members of the E.S.S. initiated discussions concerning the mapping of the distribution of various insects in the province. By 1975, special distribution maps had been designed and distributed to members. These maps, were the result of intense searching worldwide by **Peter Harris** and the late **Mukul Mukerji**. They bore the appropriate and acceptable grid system that divided the province into known sectors of latitude and longitude. The presence of specific insects in any of these sectors could be indicated by an appropriate symbol.

To date we have 13 members working on the distribution of specific insect species belonging to the Orders: Lepidoptera, Coleoptera, Orthoptera, Diptera, and Ephemeroptera. However, only two publications have been completed. They were published by the Saskatchewan Museum of Natural History. These are: "*Bumble Bees of Saskatchewan (Hymenoptera: Apidae)*"* by **Philip S. Curry**; and "*The Black Flies (Diptera: Simuliidae) of Saskatchewan*"* by **F.J.H. Fredeen**.

* Natural History Contributions No. 5 and No. 8, respectively (1984, 1985)

(g) Awareness through Extension Work

Throughout the years members of the Society have been active in detailing entomological events as they happened.Outbreaks of noxious insects, such as the annual surveys, forecasts, and control of grasshoppers; the disasterous plague of Bertha armyworm in 1971, etc., have received wide coverage in the press, and on radio and televison. Most of the coverage has been the work of the extension entomologists of the province: **M.E. Taylor**, **C.E. Lynn**, **C.F. Barrett**, and **J.L. Harris**.

In the past ten years, **P.W. Riegert** of the University of Regina, has been involved in regularly scheduled programs dealing with insects. CKCK Television has aired eight programs (1983-1986) dealing with life histories, damage, and control of various noxious pests. CBC Radio has just aired a series of eight bi-monthly programs on a variety of topics ranging from insect diapause and insect colours to winter survival and food habits. It has been a most interesting experience and judging from the feed-back from listeners entomology has become significantly better known and appreciated by the public at large.

If the next 40 years prove to be as interesting, stimulating, and productive for the members of the Entomological Society of Saskatchewan as the past 40 years have been, then I can forecast that entomology in Saskatchewan will continue to blossom and grow and reach new heights. We may find that fewer people will be designated as "entomologists" but the work they do will still involve that most fascinating of all of God's creatures, the insects.

Founding Members - Entomological Society of Saskatchewan

R.K. Allen
*A.P. Arnason
J.C. Arrand
*A.R. Brooks
C.E. Brown
C.H. Craig
G.R.F. Davis
C.G. Devlin
F.J.H. Fredeen
*R.B. Lowe
H. McDonald
M.N. MacLeod
*H.A. McMahon
E.G. Peters
L.O.T. Peterson
R. Pickford
L.G. Putnam
*J.G. Rempel
*L.G. Saunders
J.A. Shemanchuk
W.W.A. Stewart
M.E. Taylor

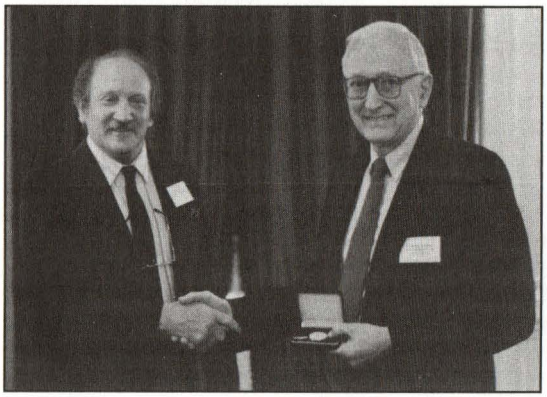
[* deceased]

Presidents of the Entomological Society of Saskatchewan

1952: L.G. Putnam
1953: L.G. Putnam
1954: C.E. Brown
1955: R.H. Burrage
1956: L.G. Putnam
1957: J.B. Hartley
1958: P.W. Riegert
1959: H. McDonald
1960: J.G. Rempel
1961: C.H. Craig
1962: F.J.H. Fredeen
1963: A.B. Ewen
1964: M.E. Taylor
1965: M.N. MacLeod
1966: L.O.T. Peterson
1967: L. Burgess
1968: J.F. Doane
1969: N.S. Church
1970: R.L. Randell
1971: H. McDonald
1972: D.M. Lehmkuhl
1973: R.H. Burrage
1974: R. Pickford
1975: K.S. MacKinlay
1976: M.G. Maw
1977: S.H. Gage
1978: P. Harris
1979: J.F. Doane
1980: R.R. Hooper
1981: A.P. Arthur
1982: W.F. Steck
1983: C. Gillott
1984: O.O. Olfert
1985: J.L. Harris
1986: P.G. Mason
1987: K.A. Pivnik
1988: K.C. Moore
1990: M.A. Erlandson
1991: J.J. Soroka
1992: P. Harris

PERSONALIA

DR. GLENN B. WIGGINS
Recipient of the Entomological Society of Canada
GOLD MEDAL
for Outstanding Achievement in Canadian Entomology



President Richard Ring (left) presenting Dr. Glenn B. Wiggins (right) with the Gold Medal at the 42nd Annual Meeting of the Entomological Society of Canada September 28, 1992 in Saskatoon, Saskatchewan

THE GOLD MEDAL AWARD WINNER
Dr. Glenn B. Wiggins

The Gold Medal for outstanding achievement in Canadian entomology is awarded in 1992 to Dr. Glenn Blakely Wiggins, Curator in the Department of Entomology at the Royal Ontario Museum, Toronto. Dr. Wiggins is honoured primarily for his research on the biosystematics of Trichoptera; but recognized as well are his professional contributions and his achievements as a museum curator and educator.

Glenn Wiggins completed his early education in Brampton, Ontario, followed by B.A. and M.A. degrees in biology at the University of Toronto. He was employed by the Fisheries Research Board of Canada for two years in research on Atlantic salmon in Newfoundland, but returned to Toronto to take up graduate study on the systematics of aquatic insects, based in the Royal Ontario Museum's Department of Entomology where he was to become a member of the curatorial staff. He completed his Ph.D. degree in 1958, and has remained at the ROM through a career of 40 years; he was appointed as Curator Emeritus in 1992.

Dr. Wiggins' research has been concentrated on the biosystematics of Trichoptera, a dominant and diverse group of aquatic insects in all types of fresh waters. Lack of adequate taxonomic knowledge for the aquatic larvae is, however, a major obstacle in studying and understanding their ecological

interactions in freshwater communities. Undertaking to reduce this deficiency for North American Trichoptera, Dr. Wiggins began an intensive field and laboratory research program on larval taxonomy in 1961. His book, *Larvae of the North American Caddisfly Genera* (University of Toronto Press, 1977) was the first comprehensive treatise on the taxonomy and biology of the 142 North American genera, establishing identity for the first time for the larvae of one-third of the genera of the continent. This work was selected as one of the outstanding academic books of the year by the editors of the *Journal of the Association of College and Research Libraries*, one of only 8% so honoured among 6680 books reviewed. The book is the primary reference for the taxonomy and biology of caddisfly larvae, and has opened the door to a new level of precision in ecological studies on Trichoptera. Further research by Dr. Wiggins since 1977 has brought many changes to the field, and a revised edition is under way.

From this base, he pioneered the use of larval characters in elucidating phylogenetic relationships in Trichoptera; and from research based on morphology and behaviour of all life stages, Dr. Wiggins and his students and associates have made a number of significant advances in the biosystematics of Trichoptera in North America, Japan, and other parts of the world, exploring evolution within the group in directions never before undertaken. A research centre and collection of global significance have been established at the ROM through his work on Trichoptera, giving Canada a well-defined niche in the international systematics community. He has made important contributions to aquatic ecology, most notably as principal author of a seminal and widely cited study on evolutionary and ecological strategies of animals in annual temporary pools (1980), and of a recent analysis of the Trichoptera of Yukon and Beringia. He is the author or co-author of some 100 publications on Trichoptera including several invited chapters in reference works, and on other aspects of his activities; and he has presented many invited lectures about his research at conferences and universities throughout North America and also in Japan.

As a museum curator for 40 years, Dr. Wiggins has developed the ROM insect collection into an important resource for research, teaching, and reference. He also has been a foremost advocate of enhancing public appreciation of the world of insects and arthropods. His enthusiasm to share his insights with others through museum exhibits including pioneering work on live displays, adult education courses and field trips, and behind-the-scenes museum visits has created a legacy of enrichment valued by its recipients and of considerable value to entomology in Canada. Currently, he is working on interpretive books about caddisflies and other insects. He has served on many important committees setting out new directions for the Royal Ontario Museum, and he initiated proceedings that led to establishment of the Department of Botany in 1978, and the Department of Invertebrate Zoology in 1981. He has served also on external review committees for other museums.

Holding a cross-appointment to the professorial staff of the Department of Zoology, University of Toronto since 1968, Dr. Wiggins has taught at both the undergraduate (aquatic entomology) and graduate levels (systematic entomology); he has supervised the research of graduate students and post-doctoral associates, and has served as an external examiner for theses. A major contribution to the training of graduate students in systematic zoology was his organization of an NRC Negotiated Development Grant proposal to establish the Laboratory of Analytical Systematics, one of the first facilities for molecular systematics in Canada; he was project co-ordinator of the Laboratory from its establishment in 1968 until 1988. He served on NSERC Grant Selection Committees (1988-91) and was actively involved in their restructuring. In all of these activities, Dr. Wiggins has been an advocate for systematic biology. He was appointed Visiting Professor at the University of Minnesota (1970, 72, 74) and the University of Montana (1981) where he provided field courses; and he presented a Trichoptera Workshop at the University of Denver (1983).

Dr. Wiggins has been active in the affairs of the Entomological Society of Canada for nearly 30 years, starting with his organization of a public exhibit at the ROM (1963) commemorating the Centennial of Entomology in Canada, and culminating with his election as President of the Society for 1982, the year of a joint annual meeting of the ESC and ESO with the Entomological Society of America in Toronto. As ESC Vice-President (1978) he initiated a new approach to the Science Policy program. From 1976 to 1991 he was a member of the Scientific Committee of the ESC's Biological Survey of Canada (Terrestrial Arthropods), and was appointed as one of its directors. He has worked to further the objectives of the Survey and to establish it on a permanent basis in the Canadian Museum of Nature; he was the principal author of the Survey's brief *The importance of research collections of terrestrial arthropods* (1991). Dr. Wiggins was appointed as a Fellow of the ESC in recognition of his major contributions to entomology (1982).

His service on the boards of professional organizations has been widely recognized for wise counsel and articulate presentation of issues. Dr. Wiggins was a member of the Biological Council of Canada (1981-85), where he was elected Vice-President and wrote the BCC brief *Hiring policy for scientists in the federal government.*

For outstanding achievement in entomological research, education, and professional activities, the Entomological Society of Canada takes great pleasure in awarding the Gold Medal Award for 1992 to Dr. Glenn B. Wiggins.

DR. DANIEL JOHNSON
Recipient of the Entomological Society of Canada
C. GORDON HEWITT AWARD
for Outstanding Achievement in Canadian Entomology

President Richard Ring (left) presenting Dr. Daniel Johnson (right) with the C. Gordon Hewitt Award Plaque at the 42nd Annual Meeting of the Entomological Society of Canada September 28, 1992 in Saskatoon, Saskatchewan

THE C. GORDON HEWITT AWARD WINNER
Dr. Daniel L. Johnson

The 1992 recipient of the Entomological Society of Canada's C.Gordon Hewitt Award for outstanding achievement in entomology by an individual under 40 is Dr. Daniel Lloyd Johnson of the Crop Sciences Section, Agriculture Canada Research Station, Lethbridge, Alberta.

Dr. Johnson was born in Yankton, South Dakota, on 30 September 1953. He received his B.Sc. in Biology, Magnis cum honoribus, from the University of Saskatchewan in 1978. He was awarded his M.Sc. by the University of British Columbia in 1980 for research on "Growth and regulation of springtail populations, with special reference to predation by pseudoscorpions" and his Ph.D. from the same institution in 1983 for research on "Dispersal, predation and weather in an orchard mite system". The research for both postgraduate degrees was supervised by Prof. W.G.Wellington of the Institute of Animal Resource Ecology, University of British Columbia. During his graduate studies Dr. Johnson received several scholarships including an Izaak Walton Killam Postgraduate Scholarship in 1982-83.

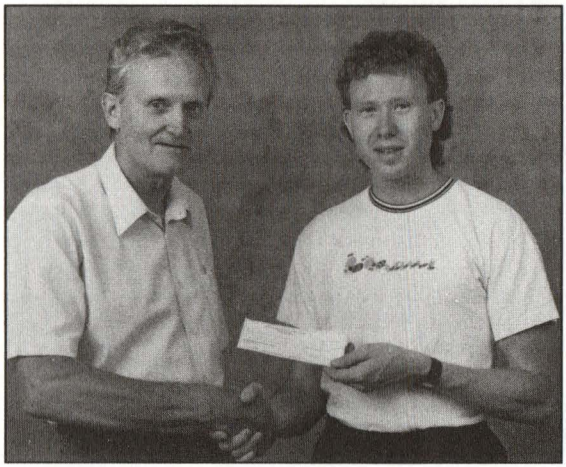
Since 1983, Dr. Johnson has been an entomologist with Agriculture Canada at Lethbridge where he has developed an internationally recognized program on the ecology and control of grasshoppers. His major areas of research center on the development of methods to reduce the use of insecticides. His research includes the improvement of methodologies for field testing and assessment of efficacy, analysis of pest populations and development of microbial control. He has used GIS methods for the forecasting and geographical analysis of pest outbreaks, and to study the economics of crop protection and the distribution of threatened wildlife. He has been successful in obtaining considerable outside funding for his research from the Alberta Agricultural Research Institute. Environment Canada, USDA, the UN, CIDA, IDRC and private industry.

Dr. Johnson has 37 publications in refereed journals and books, and numerous technology transfer articles. At the local and regional level he has established good rapport with producer organizations and extension workers and is frequently asked for presentations by producer groups and for interviews by the news media. His international standing is indicated by numerous invitations to speak at international scientific conferences and workshops.

Dan has been deeply involved in several international projects including a CIDA/Malaysia Department of Agriculture cooperative project on the application of spatial modelling and analysis to crop pest management in southeast Asia. At the request of the U.S. Agency for International Development, in cooperation with FAO and Ciba-Geigy, he conducted major field experiments in west Africa in 1989 and 1990 to test the efficacy of *Nosema locustae* and *Beauveria bassiana* for control of grasshoppers. At a world conference on biological control of grasshoppers and locusts, held in Benin in April, 1991, Dan chaired a symposium on Biology, Ecology, Field Experimentation, and Environmental Impact. He has recently been appointed Project Monitor of a joint Canada-USA-UK-Netherlands project on biocontrol of grasshoppers and locusts in north and west Africa.

The Entomological Society of Canada takes great pleasure in presenting the C. Gordon Hewitt Award to Dr. D.L.Johnson in recognition of his outstanding contributions to Canadian entomology.

ROBERT A. ANDERSON
Recipient of the 1992 Entomological Society of Canada GRADUATE RESEARCH TRAVEL GRANT



Dr. R.A. Brust (left) presenting Robert A. Anderson (right) with the cheque for the ESC Graduate Research Travel Grant. Dr. Brust is Mr. Anderson's Ph.D. supervisor.

To the ESC Membership and Scholarship Committee:

I would like to convey my appreciation to the Entomological Society of Canada for their decision to award to me the 1992 Graduate Research Travel Grant. The grant allowed me to travel to Vero Beach, Florida and work in collaboration with Dr. Jonathan F. Day, a faculty member at the Florida Medical Entomology Laboratory.

The trip to Florida provided an opportunity to obtain data on the blood feeding success of *Culex nigripalpus*, the primary enzootic and epizootic vector of Saint Louis Encephalitis in Florida. *Culex nigripalpus* is similar behaviourally and ecologically to *Culex tarsalis*, the species of primary importance to my research in Manitoba. Thus, comparative data for these two species is important in determining the general significance of interrupted and multiple blood feeding by mosquitoes. I look forward to following up new research opportunities generated from this project.

The Entomological Society of Canada is to be congratulated for its foresight in providing grants and scholarships to student members in recognition of their desire to begin careers in entomology and to gain experience outside of their home universities. This recognition is encouraging and a significant honour. Again, I thank the ESC for this award and I look forward to presenting the results of my research at a future meeting.

Robert A. Anderson
Department of Entomology
University of Manitoba

Bob Vernon (right) presenting an E.S.C. Post-graduate Scholarship Award to **MAYA EVENDEN** (left) of Simon Fraser University at the 91st Annual Meeting of the Entomological Society of British Columbia on October 23, 1992.

Richard Ring (right) presenting the President's Prize for Best Student Paper to **STEVE SCHOFIELD** (left) of Trent University at the Annual Meeting of the Entomological Society of Canada in Saskatoon on September 29, 1992.

Richard Ring (right) presenting the Criddle Award for excellence in amateur entomology to **JOHN KOZIAL** (left) at the Annual Meeting of the Entomological Society of Canada in Saskatoon on September 29, 1992.

Richard Ring (right) presenting an E.S.C. Post-graduate Scholarship Award to **MARTIN HARDY** of Laval University at the Annual Meeting of the Entomological Society of Canada in Saskatoon on September 29, 1992.

MEMBERS IN THE NEWS

Dr. Marie-Claude Larivière moves to Auckland, New Zealand

Marie-Claude Larivière was appointed SYSTEMATIST/CURATOR: HEMIPTERA for the New Zealand Arthropod Collection in Auckland, New Zealand, on October 5, 1992.

Marie-Claude received her doctorate in 1990 from McGill University, Montréal, where she studied the systematics of Stink Bugs (Pentatomidae). Subsequently, she spent 21 months at the CLBRR, BRD of Agriculture Canada, Ottawa, where she conducted postdoctoral research on Damsel Bugs (Nabidae). We wish her all the best in her new position.

Her new address is: Dr. M.-C. Larivière, Native Plants and Animals Division, CRI Landcare Research, 120 Mt Albert Road, Private Bag 92170, Auckland, New Zealand; Tel. 64-9-849-3660; Fax.64-9-849-7093

Mark Winston and Keith Slessor - Winners of the 1992 British Columbia Science and Engineering Gold Medal for Natural Sciences

Mark Winston and Keith Slessor of Simon Fraser University's Departments of Biological Sciences and Chemistry, respectively, are the winners of a 1992 British Columbia Science and Engineering Gold Medal for Natural Sciences. Winston and Slessor have investigated a new method for increasing crop production through natural pollination. Together they have isolated, identified and synthesized the pheromones, or chemical attractants, of the honey bee queen. They have also defined the authoritative role that these pheromones play in honey bee colonies.

Winston and Slessor's remarkable work on queen bee pheromones is already being applied successfully on a commercial basis by BC farmers. Bee-attracting pheromone sprays have shown net profit increases of $1000 per hectare in pear orchards and up to $4500 per hectare in cranberries. Pheromones are also used to attract queenless swarms, to delay the onset of swarming, to stimulate workers to collect more pollen and to rear more brood, to enhance queen production, and to transport queenless worker bees without their becoming an angry mass. These additional uses for pheromones promise to revolutionize current beekeeping practices.

Originally from Ohio and now residing in New Westminster, Mark Winston received his B.Sc. in Biology in 1971 from Boston University, his Master's in Marine Biology from the same institution in 1975 and his PhD. in Entomology in 1978 from the University of Kansas.

Keith Slessor was born in the Comox valley and grew up in Ladysmith, B.C. He obtained his B.Sc. in Chemistry/Physics in 1960 and his PhD. in Organic Chemistry in 1964 from the University of British Columbia. Maple Ridge, B.C. has been his home for more than a decade.

For their outstanding contributions to science and to the agriculture industry in B.C., Mark Winston and Keith Slessor were honoured at the B.C. Science and Engineering Awards Dinner in Vancouver on October 20th.

NEWS OF ORGANIZATIONS

International Commission on Zoological Nomenclature

Applications published in the *Bulletin of Zoological Nomenclature*

The following applications were published on 30 September 1992 in Vol. 49, Part 3 of the *Bulletin of Zoological Nomenclature*. Comment or advice on these applications is invited for publication in the *Bulletin of Zoological Nomenclature* and should be sent to the Executive Secretary, I.C.Z.N., c/o The Natural History Museum, Cromwell Road, London SW7 5BD.

Case 2828 *Podisus* Herrich-Schaeffer, 1851 (Insecta, Heteroptera): proposed conservation of *P. vittipennis* Herrich-Schaeffer, 1851 as the type species

D.B. Thomas
USDA-ARS Subtropical Agricultural Research Station, 2301 South International Boulevard, Weslaco, Texas 78596, U.S.A.

W.R. Dolling
Department of Entomology, The Natural History Museum. Cromwell Road, London SW7 5BD, U.K.

Abstract. The purpose of this application is to conserve the name *Podisus* Herrich-Schaeffer, 1851 in its accustomed usage for a genus of predatory stink-bugs important as biological control agents. Kirkaldy's (1909) designation of *P. vittipennis* Herrich-Schaeffer, 1851 as the type species is preceded by Schouteden's (1907) designation of *P. punctipennis* Herrich-Schaeffer, 1851. The earlier designation would make *Podisus* a junior subjective synonym of *Apateticus* Dallas, 1851, and the genus as universally understood would be replaced by *Telepta* Stål, 1860, rejected as a junior synonym of *Podisus* for over 120 years.

Case 2795 ANTHRIBIDAE Billberg, 1820 (Insecta, Coleoptera): proposed precedence over CHORAGIDAE Kirby, 1819

Hans Silfverberg
Universitetets Zoologiska Museum, N. Järnvägsgatan 13, SF-00100 Helsingfors, Finland

Abstract. The purpose of this application is to conserve the well known beetle family name ANTHRIBIDAE Billberg, 1820 (type genus *Anthribus* Geoffroy, 1762) by giving it precedence over CHORAGIDAE Kirby, 1819 (type genus *Choragus* Kirby, 1819).

Case 2811 *Catocala connubialis* Guenée, 1852 (Insecta, Lepidoptera): Proposed conservation of the specific name

Lawrence F. Gall
Entomology Division, Peabody Museum of Natural History, Yale University, New Haven, Connecticut 06511, U.S.A.

Abstract. The purpose of this application is to conserve the specific name of the Connubial Underwing moth *Catocala connubialis* Guenée, 1852. This name is threatened by its unused senior synonym

Phalaena amasia Smith, 1797 which was long thought to be invalid as a junior secondary homonym of *Catocala amasia* (Esper). However, it is now known that Esper's name was not published until 1804. Smith's name *amasia* is therefore available and it is now proposed that it be suppressed.

Case 2793 **METOPIINAE Foerster, 1868 (Insecta, Hymenoptera), METOPIINI Raffray, 1904 (Insecta, Coleoptera), and METOPIINI Townsend, 1908 (Insecta, Diptera): proposed removal of homonymy**

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Abstract. The purpose of this application is to avoid homonymous family-group names in three orders of Insecta. It is proposed that the complete generic names of *Metopias* Gory, 1832 and *Metopia* Meigen, 1803 be adopted as the stems for the corresponding family-group names, giving METOPIASINI Raffray, 1904 (Coleoptera) and METOPIAINI Townsend, 1908 (Diptera). The subfamily name METOPIINAE Foerster, 1868 (Hymenoptera) based on *Metopius* Panzer, 1806 would remain unchanged.

Case 2812 ***Acamptopoeum* Cockerell, 1905 (Insecta, Hymenoptera): proposed designation of *Camptopoeum submetallicum* Spinola, 1851 as the type species**

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Abstract. The purpose of this application is to designate *Camptopoeum submetallicum* Spinola, 1851 as the type species of the South American panurgine bee genus *Acamptopoeum* Cockerell, 1905 in accordance with current usage. The original designation was based on a misidentified type species.

The following **Opinions** were published on 30 September 1992 in Vol. 49, Part 3, of the *Bulletin of Zoological Nomenclature*:

Opinion 1693. *Coccinella undecimnotata* Schneider, [1792] (currently *Hippodamia (Semiadalia) undecimnotata*; Insecta, Coleoptera): specific name conserved.

Opinion 1694. *Rhinapion* Beguin-Billecocq, 1905 (Insecta: Coleoptera): conserved.

News from the Newfoundland Insectarium

Insects - you either love them or you hate them. Unfortunately the only people who have any fondness for insects are entomologists and bee keepers. The vast majority of the population look upon insects with indifference, or have a mortal fear of these tiny animals. Their first reaction on seeing one is to give it the boot, so to speak. We have to find a way to change peoples attitudes towards insects and their relatives, so that their first reaction is not to squash them but to take a closer look. We believe that public education is the key to changing these attitudes.

In the very near future at least part of Eastern Canada will be offered the opportunity to get to know these remarkable animals on a more intimate basis. When the *Newfoundland Insectarium* opens to the public in 1994 its combination of preserved specimens and live displays will feature the "stars" of the insect world. The insect fauna of Newfoundland and the boreal region will be featured as well as many other species from around the world. If the popularity of its predecessor, the *Insectarium du Montreal*, is any indication, the *Newfoundland Insectarium* will be a huge hit.

Public education will be one of the primary objectives of the Insectarium. Clientele for the facility will include tourists, local and provincial residents, and school children. Themes, such as identification, classification, and distribution will be illustrated along with others such as adaptation, colouration, and diversity, to make a visit to the facility an educational as well as entertaining experience. The display of living material will be given very high priority. Mobile exhibits will be developed to travel to the more remote parts of the province. This will enable the *Newfoundland Insectarium* to serve a much broader area, and make it a truly regional resource.

Another of the primary objectives of the *Insectarium* is to serve the scientific community. Newfoundland and Labrador are two areas of Canada that have not been extensively studied for their insect and arachnid populations. It will be our goal to carry out extensive collection programs throughout the province. The resulting material will be housed at the *Insectarium* where it will be made available to scientists throughout Canada and around the world. Space will also be available at the facility for people wishing to visit the area to carry out collecting programs, or to study the collections housed there. We hope our colleagues will take advantage of the many specimens we will have available.

The third function of the *Insectarium* will be that of touristic nature. By attracting visitors to Newfoundland and in particular the west coast of the province, we hope to give an economic boost to this region of Canada.

The establishment of an *Insectarium* is an enormous task. The design of the facility, the planning of the exhibits, and the acquisition of the many specimens needed for the displays is only part of the battle. You also have to acquire the funds to turn all of these plans into reality. The dedication and support of a great number of people, both locally and around the world has made this task a lot easier. The *Insectarium du Montreal* staff along with its founder, Mr. George Brossard, as well as the Humber Valley Development Association are just a few of those who have shown tremendous support. There are many others too numerous to mention. If any fellow member of the Canadian Entomological Society feels that he or she can throw any support our way - we would be very grateful to hear from you.

There are a number of ways you can assist this project. These include supplying specimens which are suitable for display purposes; by offering your expert services for the identification of our collected specimens; by supplying mobile or temporary exhibits you might have available; by sending pictures, slides, or printed information which you feel could be of use to us. Please remember that we are just getting established so we are in need of even the most basic things. Naturally, if we can be of any assistance to any of our colleagues we will be happy to comply with your request.

We would finally like to thank the Entomological Society of Canada for its recent endorsement of the *Newfoundland Insectarium*. Its establishment will indeed mark a significant advancement in entomology in this region of Canada. Who knows? Perhaps the educational programs in the provincial schools will spark the interest of some children who will become our future generation of entomologists.

Lloyd H. Hollett
Gary A. Holloway
Directors and Founders

PUBLICATIONS

BOOK NOTICES

Darling, D.C. 1991. *Revision of the World Species of Spalangiopelta (Hymenoptera: Chalcidoidea: Pteromalidae: Ceinae).* Royal Ontario Museum Life Sciences Contribution No. 155. Royal Ontario Museum Publication Services, Toronto, Ontario, Canada. 48 pp. Softcover $(Can.)11.00.

This world revision was prompted by the discovery of undescribed Nearctic and Neotropical species of *Spalangiopelta*, and is based on examination and comparative studies of the primary types of all species except one. Ten species are recognized, six from Nearctic and Neotropical regions and four from the Palearctic. The work includes: 1) a diagnosis and a modified description of the genus; 2) a summary of information concerning described species; 3) illustrations, modified diagnoses, redescriptions, and where necessary, lectotype designations; 4) descriptions and illustrations of three new species from the New World (*S. albigena, S. canadensis*, and *S. laevis*); 5) an identification key for world species of *Spalangiopelta*; 6) correct male and female associations for species; and 7) a discussion of the phylogenetic and biogeographical relationships within the genus. The work is illustrated with scanning electron micrographs, photomicrographs, line drawings, and distribution maps.

Roubik, D.W. 1989. *Ecology and Natural History of Tropical Bees.* Cambridge Tropical Biology Series. Cambridge University Press, Cambridge, N.Y., U.S.A. vii + 514 pp. Softcover $(U.S.)27.95; hardcover $(U.S.)75.00.

This book was previously available only in hardcover, and was reviewed for the Entomological Society of Canada by P.G. Kevan in the March 1991 issue of the *Bulletin* (Vol. 23: 44-45).

BOOK REVIEWS

Gupta, A.P. (ed.). 1991. *Morphogenetic hormones of arthropods,* Volume 1, Part 3. *Roles in Histogenesis, Organogenesis, and Morphogenesis.* Rutgers University Press, New Brunswick, New Jersey, U.S.A. xi + 635 pp. Hardcover $(U.S.)125.00.

This book, the last of the three parts of Volume 1, is another in the series that Professor Gupta has organized and edited over the past 15 years under the umbrella title *Recent Advances in Comparative Arthropod Morphology, Physiology and Development.* Unlike Parts 1 and 2 (for reviews, see Gillott, C. 1990. *Bull. Ent. Soc. Can.* 22: 217-218; 1991. *Ibid.* 23: 204-205, respectively), this part contains mostly topics dealing with insects, primarily because comparable studies in non-insectan arthropods are simply not available.

The book contains 18 chapters, the first three of which deal with hormonal regulation of embryogenetic events, the remainder with a variety of postembryogenetic topics. Chapter 1 ('Role of the Gradient Factor in Arthropod Morphogenesis'), by Novak, is a further reworking of an hypothesis that originated almost four decades ago but which still lacks a sound experimental basis. Sbrenna, in Chapter 2, gives an up-to-date account of the role of morphogenetic hormones in embryonic cuticle deposition in arthropods. More than half of Yamashita and Suzuki's chapter ('Role of Morphogenetic Hormones in Embryonic Diapause') is spent on introductory material, and even the section on hormonal control includes much information that seems irrelevant to diapause. The chapter also contains a number of statements that give cause for concern (e.g., 'In the egg of another spider, *Baetis vernus*'!). The material in Chapter 4 (hormonal involvement in metamorphosis of non-insectan arthropods), by Spindler, has essentially been covered in the chapters by Lachaise, Jegla, and Bonaric and Juberthie in Part 1. Sekeris provides a detailed account of the biochemistry of sclerotization in insects and the role of molting hormone in Chapter 5. ' Chapter 6 (by Bouthier and Noël) on the hormonal control of morphological color changes in arthropods includes a large section on insects (principally Orthoptera and Lepidoptera). This is followed by five chapters on the endocrine control of polymorphism in social insects. Noirot and Bordereau (Chapter 7) provide a good summary of the situation in termites, though our understanding appears to have advanced little over the last decade. Under the title 'Hormones and Caste Polymorphism in Sting Bees', Rembold (Chapter 8) deals with imaginal metamorphosis in the honey bee, *Apis mellifera.* Chapter 9, by Velthuis and Sommeijer, on stingless bees (Meliponinae), includes discussion of a possible genetic basis of caste differentiation in *Melipona* that predetermines which individuals can become queens, that is, develop the appropriate endocrine machinery. A short chapter by Röseler demonstrates that the hormonal regulation of caste differentiation in bumble bees (only two species of *Bombus* have been studied) is similar to that of other bees. The hormonal control of caste polymorphism in ants is discussed by Passera and Suzzoni who make a brief comparison with the situation in other social insects. In Chapter 12 Payen deals with the role of the androgenic gland in sexual differentiation in Crustacea. Mittler, in Chapter 13, summarizes the role of juvenile hormone in aphid polymorphism, and Mouze (Chapter 14) reviews the endocrine control of insect eye morphogenesis, the last relevant work in this area, apparently, being published in 1981. A seeming lack of recent work in the area is also evident from the chapter by Bullière and Bullière on 'Morphogenetic Hormones and Regeneration in Arthropods'. In a book purporting to deal with the roles of morphogenetic hormones, it is difficult to understand the inclusion of Romer's discussion of insect oenocytes (Chapter 16). Descamps' chapter on the endocrine control of spermatogenesis in Myriapoda (almost all the work has been carried out on one species, *Lithobius forficatus*) appears to be largely a reworking of earlier reviews by this author. The chapter would have benefitted from a more comparative approach with other

arthropod groups. In the book's final chapter, Zdarek and Sivasubramanian consider the hormonal control of early metamorphosis (pupariation and pupation) in flies. The discussion suggests that knowledge of the chemical nature of the several factors involved, and their modes of action, have not advanced greatly since the existence of the factors was established more than 15 years ago.

As in previous parts, there is both a taxonomic and a subject index. The former would have greatly benefitted from cross-referencing of common and scientific names (e.g., Migratory Locust has but one entry, whereas *Locusta migratoria* has 16). By contrast, the taxonomic index has such cross-referencing as 'ZR-512 (see also Hydroprene), 408'; yet the Hydroprene entry lists only one page - 408! Also as in Part 2, there are needless figures (two of each) of juvenile hormones and ecdysteroids.

Despite my criticisms of individual chapters and the indices, the overall quality of the information presented is high, and insect and comparative endocrinologists will find much of interest in Part 3. Inevitably, there are gaps (e.g., if spermatogenesis in myriapods merits inclusion, then surely that of insects should also have been considered) just as there is 'overkill' (three chapters on bee polymorphism), but overall Professor Gupta has done a fine job of persuading many of the leading arthropod endocrinologists to share their knowledge and ideas. Unfortunately, like all such specialized review texts, the book is expensive, and this may restrict its accessibility for many individuals.

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Emmel, T.C., Minno, M.C., and B.A. Drummond. 1992. *Florissant Butterflies: A Guide to the Fossil and Present-day Species of Central Colorado.* Stanford University Press, Palo Alto, California, U.S.A. 119 pp., 9 color plates. Softcover $(U.S.)14.95; hardcover $(U.S.)35.00.

This book is the ultimate in local faunal lists. It covers the 97 extant and 12 extinct species of butterflies known from a diverse and well-researched area in the Pike's Peak region of central Colorado. The book is unusual in its depth of coverage of a small area; the study area is primarily restricted to the 6,000 acres of the Colorado Outdoor Education Center. Of even greater interest is the fact that the coverage begins 35 million years ago.

Ten pages of text, two pages of black and white photos and one color plate deal with the famous Florissant fossils. These were deposited in the early Oligocene and comprise a large proportion of the fossil butterflies known in the world. Twelve species have been described from Florissant material and are placed as members of three modern families of butterflies. Emmel et al. provide photos and a brief, readable description for each of the fossil species, as well as a synopsis of the climate in which they lived, the conditions under which specimens were deposited, and a history of their study. This chapter will, by itself, justify purchase of the book by many butterfly enthusiasts.

The remainder of the book is a more standard regional butterfly guide. Most of the terrain of the area lies in rolling montane hills between 8,400' (2,600 m) and 9,200' (2,800 m) elevation, and there is a lengthy section on the habitats of the area and the ecology of its butterflies. This is followed by writeups for each of the species that have recently been found in the area. There is a substantial amount of new

information on larval host plants, as well as descriptions of immature morphology and behavior. Numerous larvae and adults are illustrated with black and white photos in the text. A separate section of color plates illustrates many adults in the field, as well as museum specimens of all species treated in the book. The book is reasonably well-referenced for a nature guide, but original ecological information for the Florissant region is not always clearly distinguished from information obtained from other regions or other authors. Although only a small area and a narrow altitudinal gradient is treated, only vague ranges are given for flight periods. A table that summarizes and organizes flight period information would have been useful.

There is a basic glossary of terms at the back of the book, as well as separate indices for host plants and general items. A list of modern species rounds out this part of the book; it comes complete with empty spaces for readers to check off the butterflies they encounter.

In part, this book seems to have been designed as a support text for workshops on Lepidoptera Biology that are offered annually at the Colorado Outdoor Education Area. It will also be useful to butterfly enthusiasts who have an interest in the fauna of the southern Rocky Mountains, as well as to anyone interested in butterfly fossils. *Florissant Butterflies* is lavishly illustrated and will certainly appeal to nature tourists passing through the Colorado Rockies.

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Lomer, C.J., and C. Prior (eds.). 1992. *Biological Control of Locusts and Grasshoppers.* C·A·B International, Wallingford, Oxon, U.K. 394 pp. Softcover $(U.S.)35.00.

The subject content of this book is more narrow in scope than the title suggests. This book contains the proceedings of a workshop held at the International Institute of Tropical Agriculture, Cotonou, Republic of Benin, 29 April - 1 May 1991. The workshop was planned as part of a collaborative project to demonstrate the feasibility of locust and grasshopper control using an oil-based formulation of a fungal pathogen. Admittedly, there are several topics in the book that are peripheral to this subject; however, entomopathogenic fungi as they pertain to locust control in Africa predominate the discussions. The collaborating agencies involved in the workshop were the International Institute of Biological Control of C·A·B International, the Biological Control Program of the International Institute of Tropical Agriculture, and the Department of Crop Protection Training of the Permanent Inter-State Committee for Drought Control in the Sahel.

The book is divided into six sections including 42 reports and presentations from 57 authors. Section I is titled 'Organizations Concerned with Locust and Grasshopper Control, and Country Reports'. The summaries of activities of twelve international agencies that are funding research projects related to biological control of grasshoppers and locusts are presented. This section also contains brief reports of locust activities in five regions of Africa: the Congo, Mali, Republic of Benin, Senegal, and Sudan. Section II, 'Agents for Biocontrol', contains four papers which introduce several control agents: natural enemies, fungal agents, and neem oil. Section III, 'Exploration and Characterization', includes five papers, all dealing with discovery and characterization of fungal pathogens. Section IV is titled

'Mass Production, Application and Formulation'. Three of the six papers presented here are directly concerned with production, formulation, and field application of fungal pathogens. The remaining three topics are more application-oriented, such as controlled droplet application of mycopesticides and ULV sprays. Section V, 'Biology, Ecology, Field Experimentation and Environmental Impact', contains nine papers, seven of which discuss specific locust control projects in Africa. Section VI presents a brief discussion of the closing session. The book concludes with a list of names and addresses of all delegates attending the workshop.

This book may be of interest to insect pathologists and entomology program leaders for several reasons. One, the book provides an overview of the entire arena of locust entomopathogenic fungi, from discovery to field application trials. Two, the book presents an update of locust activities in Africa. Three, the book documents which international agencies are concerned with locust control in Africa, and the scope of their programs.

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Shorthouse, J.D., and O. Rohfritsch (eds.). 1992. *Biology of Insect-induced Galls*. Oxford University Press Inc., Don Mills, Ontario, Canada. 285 pp. Hardcover $(Can.)105.00.

Biology of Insect-induced Galls is a volume of special interest because many eminent biologists have contributed chapters to it, summarizing the recent advances in cecidology. Using appropriate gall models, they have clarified several of the questions that have been evading reasonable explanation so far. Indeed, at one point, I was reminded of Trotter's article in the inaugural issue of *Marcellia* (1902. Progresso ed importanza degli studi Cecidologici. *Marcellia* 1: 5-12), and reckoning with the output of this book, exactly nine decades later, I began to admire Trotter's scientific vision!

Shorthouse and Rohfritsch have made a sincere effort to bring together the scientific philosophies of the French and American cecidological schools and I deem this to be the most impressive dimension of this book. The French school, from the time of Houard, has been adopting a morphological approach, concentrating on the development and physiology of the gall in relation to the growth of the insect, considering each gall type unique in space and time. The American school (research groups of Warren G. Abrahamson, Peter W. Price, and Thomas G. Whitham) has essentially been adopting an empirical ecological approach, considering the gall problem on a population basis. The structuring of the book thus brings together both these approaches so effectively that any beginner is sure to get a balanced exposé of the divergent perspectives of gall research.

The book begins with an introductory chapter by Mani, a distinguished cecidologist and the author of the classic 'Ecology of Plant Galls'. Recalling briefly the pioneering efforts of several workers from Marcello Malpighi, he traces the growth of gall research from casual study to its development today into a complex, major biological research field. Following this, Dreger-Jauffret and Shorthouse describe the diversity patterns as evident among gall insects and their galls. This is an impressive chapter with many examples drawn from all over the world giving a comprehensive picture of gall types and their inducers. The next, on the evolution of the gall-inducing guild by Roskam, is perhaps one of the best

in this book. With a definition of 'guild', Roskam discusses the evolution of the gall-forming habit among insects, particularly in Hymenoptera and Diptera. Larew then provides a brief chapter on fossil galls, and I am sure this will help readers to appreciate the evolutionary concepts put forward by Roskam in the previous chapter.

Chapters 5-9 are by the French cecidologists. Rohfritsch analyzes developmental patterns among galls of several groups and concludes that those of gall-midges, sawflies, and gall-wasps are the basic gall models, and from these the other insect gall systems can be derived. This is a well-articulated essay offering many scientific challenges to the reader. Rey, in the next chapter, describes the developmental morphology of hymenopteran galls and adequately supplements the preceding one. Rohfritsch and Anthony then discuss the strategies of two groups of cecidogenous Hymenoptera (Adelgidae and Eriococcidae) in the process of inducing galls. Some statements like "... the whole insect genus expresses the same type of cecidogenic reaction such that the gall type becomes a characteristic of the genus" offer a challenge either to be established or negated. The hallmark of the French school is the study of nutritive tissue. With profound facility and authority, Bronner analyzes the structure and functions of the nutritive tissue of midge and cynipid galls. She also touches upon the galls that have no nutritive tissue and ambrosia galls where fungal mycelia serve as the nutritional source to the gall insect. In the subsequent chapter, Westphal evaluates the process of gall development and resistance mechanisms known in acarine galls.

Next, Hori discusses several of the available theories that attempt to explain the mechanics of gall formation. He has summarized all the proposals made so far involving the salivary and excretory secretions and their role in gall initiation and growth. Birch, Brewer, and Rohfritsch demonstrate in the next chapter how plant quality can influence cecidogenesis and how the insect's life-cycle characteristics can affect gall characteristics, using the well-known cecidomyiid, *Dasineura affinis*. Thrips are a little-known group of gall insects and Ananthakrishnan describes the unique aspects of thrips-induced galls in the following chapter. Subsequently, Skuhrava and Skuhravy deal comprehensively with the bioecology of gall midges associated with the common reed (*Phragmites communis*) in central Europe. This chapter is an inspiring demonstration of how to study a gall and its insect; the holistic analysis by the Skuhravys involving botanical, entomological, and ecological dimensions is brilliant. In the next chapter, Price reviews the current knowledge on the gall-inducing sawflies in the light of the results of his own research and those of his group. He discusses the adaptive radiation among the sawflies and traces the evolution of leaf-folding and gall-forming species from the free-living ones, besides discussing the trophic webs of *Pontania proxima* and *P. pacifica* gall systems, viewed against the host-plant quality and parasitoids. Using *Pemphigus* galls, Whitham then examines critically plant resistance and defense characteristics in relation to gall formation and the complex biology of the aphids. In the following chapter, Wiebes-Rijks and Shorthouse discuss the ecological dimensions of insects inhabiting cynipid galls. The information provided here helps us in understanding niche partitioning, community stability, population regulation, competition, coevolution, and host specificity. The last chapter by Frankie, Morgan, and Grissel opens a new approach to gall study; they report the effects of urbanization on the distribution and abundance of a cynipid gall wasp on ornamental live oak in Texas.

Shorthouse and Rohfritsch indicate in the preface that this book aims at emphasizing the recent advances in the fundamental principles of cecidology by taking an overview and illustrating the multidisciplinary nature of gall study. I am happy that these objectives have been mostly realized. However, I would have been happier if a detailed historical chapter on the efforts of the pioneers of gall research had been included; but for their efforts, we would not be experiencing an exciting science today.

Secondly, I was a little disappointed when I did not see chapters dealing with (a) gall energetics and impact assessments and (b) aseptic culturing of gall tissue. With the growing use of insect gall systems in understanding ecological problems, these experimental methods have become extremely relevant in modern cecidology. Treatment of these dimensions by competent workers would have rendered the book more complete. Thirdly, a concluding chapter, by the editors themselves, highlighting the major conclusions arrived at in these contributions and identifying thrust areas for future research would have summed up the book effectively. Absence of such a chapter was conspicuous mainly because this is a multi-authored volume and therefore a logical sequence between chapters is difficult to attain.

In spite of these shortcomings, I will unhesitatingly rate this well-produced volume as very good; it provides a collection of fascinating, scholarly, and comprehensive articles dealing with many independent dimensions of gall research. Besides cecidologists, I am sure plant physiologists and plant morphologists interested in abnormal plant growths, entomologists working on phytophagous insects, and ecologists interested in insect herbivory and arthropod evolution will find this book extremely useful. Graduate students of 'Animal-Plant Interactions' too will find these reviews very resourceful, since many chapters describe in detail how to tackle the gall problem through viable hypotheses and tests, and contain current and exhaustive literature citations.

The price appears prohibitive. Keeping the student community and scientists in the developing countries in view, the Oxford University Press should consider bringing out a cheaper edition. Ironically, only the developing countries occupying the tropical belt are endowed with a rich variety of insect galls!

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Lawrence, P.A. 1992. *The Making of a Fly. The Genetics of Animal Design.* Blackwell Scientific Publications, Oxford, U.K. xiii + 228 pp.; 95 figs., 4 colored plates, 19 explanatory boxes, subject index. Softcover $(Can.)46.75.

Students of insect development have eagerly awaited the appearance of this book. Why? The past decade has witnessed an explosion in knowledge of how the regulatory genes of mother and zygote specify development of body pattern in larvae and adults of the fruit fly, *Drosophila melanogaster*. Such progress was not possible earlier because many of the genetic and molecular techniques required to probe these processes had yet to be devised or perfected. Now they have, with the result that every issue of *Cell, EMBO Journal, Development, Developmental Biology, Roux's Archives of Developmental Biology*, and *Developmental Genetics*, etc. is so replete with articles on these topics that anyone attempting to read and digest the literature will only succeed at the expense of his/her sleep, teaching, and research activities. This little book reviews the structure, expression pattern, interactions, and functions of some 54 of the most important of these genes and summarizes the experimental evidence for our knowledge of them.

Though aspects of the subject have been reviewed before, these accounts have been constrained by space limitations in the sources in which they appeared and by the rapidity with which the field has

advanced. Now, the pace of progress has slowed sufficiently that the facts presented in this book are reasonably secure.

Peter Lawrence has been a key contributor to progress in this area. A former student of V.B. Wigglesworth, and now with the MRC Laboratory of Molecular Biology in Cambridge, he organizes his book to reflect the diversity of areas in which he himself has participated. It contains a Preface, Introduction and Conclusions, eight chapters, and a fascinating historical account briefly (22 pp.) summarizing discovery of i) the segmentation genes; ii) morphogenetic gradients; iii) the *engrailed* gene; iv) the Bithorax complex; and v) the homeobox. The latter is the more or less conserved, 180 nucleotide base pair sequence in the DNA of many regulatory genes that encodes a 60 amino acid 'homeodomain' in their protein products. This enables these proteins to bind to the control regions of 'downstream' genes so that they can inhibit, maintain, or activate their expression, often doing so in conjunction with the bound proteins of other such genes (i.e., the proteins of most such genes act as transcription factors). As probes, these sequences have been used also to discover similar regulatory gene complexes controlling pattern formation in other animals (including man) and in the flowers of plants.

I summarize its contents below because many entomologists may not be familiar with this field of biology. Chapter 1 (24 pp.) summarizes the embryogenesis and postembryogenesis of *Drosophila* and provides the known genetic basis for blastoderm and pole cell formation and for control of gastrulation and segmentation while 2 (25 pp.), explains how the mother sets up four independent gradients in each egg through expression of maternal effect genes during oogenesis and early embryogenesis. These act to establish positional information within the egg: i) an anteroposterior gradient of *bicoid* protein deriving from RNA localized at the anterior pole and responsible for specifying head and thorax; ii) a posterior gradient necessary for forming the abdomen, whose effective agent is the product of the *nanos* gene; iii) a terminal system responsible for defining the acron and telson of the embryo and resulting from localized activation of the receptor protein *torso* at the ends of the egg; and iv) a dorsoventral gradient resulting from activation of the receptor protein *Toll* along its ventral midline. These four gradients are interpreted by zygotic gap genes (Chapt. 3; 28 pp.); each of the secondary gradients of these activated receptors appears sequentially as an increasing number of transverse, circumferential stripes of gap gene product about the egg. At first, these stripes have graded and often overlapping boundaries, but local subsets of these gradients and overlaps act to position each of the seven stripes of the final, patterning genes (his Fig. 3.4).

Results of cell lineage experiments (Chapt. 4; 29 pp.) show each cell of the ectoderm, and probably of the mesoderm, to then be assigned to one of 14 segment-length units along the length of the egg, the parasegments; each unit is one-half segment out of register posteriorly with respect to typical body segments from the mandibular to eighth abdominal (his Fig. B1.1). This is achieved by expression of the pair-rule genes, particularly *fushi tarazu* and *even-skipped* (illustrated in Plate 4.1). Expression of the pair-rule gene *engrailed* then subdivides the ectoderm (but not mesoderm) of each parasegment into posterior and anterior compartments.

As cells are allocated to parasegments they are also determined to make particular parts of the body (Chapt. 5; 29 pp.). This is achieved through controlled expression of selector genes, particularly those of the homeotic, Bithorax, and Antennapedia complexes which also define cell affinity (they provide a 'genetic address' to each cell), and by *Distal-less* which is active only in those cells destined to form appendages. Development of muscle pattern likewise depends upon expression of these selector genes but also upon interactions with the developing epidermis and nervous system.

Groups of cells co-allocated to the same developmental pathway must work together to form a body part of the correct shape, size, and pattern (Chapt. 6; 22 pp.). Individual ectodermal cells become oriented in the plane of the epidermis and develop according to their position within the group; both responses depending, in part, upon anteroposterior (body) or proximodistal (appendages), segmentally repeating, gradients of positional information within the epidermis (the genetic and molecular characteristics of these morphogens have yet to be identified). In addition, competition between cells plays an important role in controlling growth.

Embryonic cells of the central (CNS) and peripheral (PNS) nervous systems are also selected from the epidermis based on position (Chapt. 7; 22 pp.). First, groups of cells, the proneural clusters, are specified partly by localized expression of one or more transcripts of the Achaete-scute complex. Then, competitive interactions between cells of each group select one cell from among them to become a nerve (=neuroblast in CNS) or sensillum (in PNS) stem cell, a process directly involving expression of *Notch* and several other genes. (A similar process for adult sensilla occurs in the imaginal discs during postembryogenesis [his Plate 7.2].)

Among the most striking characteristics of many of these regulatory genes is that they begin to transcribe their products so early - i.e., before or during blastoderm formation - though some remain active throughout postembryogenesis, and that they are so widespread in the animal kingdom.

Finally, each compound eye in an adult consists of a crystal-like array of some 750 ommatidia (Chapt. 8; 15 pp.). Each ommatidium contains 20 cells and is constructed progressively as a single unit, beginning in the third larval instar, from epidermal cells of the eye disc. At each step, the products of specific genes interact to allocate cells to specific positions within the ommatidium. (The specification of photoreceptor cell seven by action of *sevenless, bride-of-evenless,* and *seven-up* is best known.) Eventually, most cells find a place in the lattice and the remainder die - all before metamorphosis begins!

Lawrence makes several fundamental recommendations. He proposes that genetic expression rather than developmental or structural criteria be used to define the embryonic germ layers and this results in his recognizing five rather than the traditional three (central nervous system and visceral mesoderm in addition to ectoderm, mesoderm, and endoderm). He suggests too that the parasegment not the segment is the developmental unit of importance in embryogenesis and that body parts of animals be named according to how they develop rather than according to their perceived homology or function. He emphasizes also that the segmental origin of muscles cannot be deduced from their attachment sites since muscles originating in one segment can attach in another.

A particularly positive aspect of the book is that he is careful not to speculate unduly beyond the evidence and points out repeatedly how particular results can be and have been misinterpreted.

There are several reasons why the book is short and reads so well. Investigators are rarely cited in the text (except for those provided in the history section) because of the difficulty of apportioning credit in such a fast-moving field. In fact, he asks (p. x) that the book "... not be quoted as a reference for matters of fact." (Each chapter is provided with its own short bibliography that includes recent reviews and some primary references on each of the genes considered.) Unfortunately, insects other than *Drosophila* are often referred to only as 'locust', 'bug', or 'moth', making the value of such comparative information debatable (although the true identity of these animals can sometimes be gleaned from the titles of papers

at the ends of the chapters). Details of particular techniques are presented separately in colored boxes so as not to distract from the flow of the text, but many of these are so densely written and contain so much unexplained jargon that only practitioners familiar with their use will be able to follow them. (A glossary would greatly facilitate understanding by outsiders.)

As Lawrence emphasizes, the book treats principally those aspects of insect development in which he has been active. Thus, there is little here on the genetics of oogenesis or spermatogenesis, nor on recent prodigious advances in knowledge of insect developmental neurobiology, hormones, and molting. Reference to the genetic specification of head segments anterior to the mandibular, which differs substantially from that of the rest of the body (e.g., the selector gene complexes are far less involved: Cohen and Jürgens. 1991. *Trends Gen.* 7: 267-272; Finkelstein and Perriman. 1991. *Development* 112: 899-912) is likewise omitted, even though it would seem appropriate to include, and would provide a link between the development of body pattern in primitive, short- and derived long-germ eggs. (In the former, the embryo is key-hole shaped at time of appearance and consists only of 'protocephalon' and 'protocorm', body segments behind the tritocerebral segment being added sequentially through mitosis in a proliferation zone in front of the telson; in the latter [*Drosophila* is an example], all body segments are specified simultaneously.)

A few other quibbles: i) There is no indication of size on any photomicrographs. ii) Some figures have several parts (A, B, C, D, etc. or I, II, III, IV, etc.) and Lawrence usually refers only to the whole rather than the specific part being discussed. iii) On p. xi, he states that enormous banded chromosomes are found only in the salivary glands of flies when it is well known that they occur also in the salivary glands of certain collembolans (e.g., Cassagnau. 1971. *Chromosoma* 35: 57-83) and in certain other tissues of higher flies (e.g., certain pulvillar and trichogen cells: Whitten. 1969. *Ibid* 26: 215-244; Trepte. 1976. *Ibid* 55: 137-164).

The book is attractively produced, has a striking cover illustration (a colored photomicrograph of an embryo at blastoderm labelled fluorescently with tagged antibodies to products of *ftz* and *eve* and with the head, wings, and legs of an adult drawn over it), is written with conciseness, style and wit, is beautifully illustrated with photomicrographs and coloured diagrams (often full-page), is well-printed on good quality paper, and is strongly bound. It is sure to be a classic and will undoubtedly be much used in courses in developmental biology and genetics.

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Miller, J.Y. (ed.). 1992. *The Common Names of North American Butterflies.* Smithsonian Institution Press, Washington, D.C., U.S.A. 177 pp. Softcover $(U.S.)14.95.

Butterfly aficionados have been a fractious lot. This state of affairs is reflected in an overabundance of common names applied to most butterfly species. For example, *Papilio polyxenes* is known in eastern North America as the Black Swallowtail, Eastern Black Swallowtail, American Swallowtail, Common American Swallowtail, Eastern Swallowtail, Common Eastern Swallowtail, Parsnip Swallowtail, Parsleyworm, Celeryworm, and Carawayworm. Some popular books and

conservation documents have compounded the problem by using only common names. Naturalists cannot help but be confused.

Jacqueline Miller's book provides a welcome respite from the confusion. It represents the first "official" list of common names for North American butterflies, and is the equivalent of the bird checklist put out by the American Ornithologist's Union. It is "official" in the sense that it is the result of a decade of collaborative effort by numerous lepidopterists and a joint committee of the Lepidopterists' Society and the Xerces Society. The format of the work is based on the classification and order of Miller and Brown's (1981, Lepidopterists' Society Memoir No. 2) catalogue/checklist of the scientific names, with modifications by more recent authors. All common names are listed beside the scientific name for each species or subspecies, and the preferred common name is indicated in boldface. In general the preferred common name is the one that has received the widest use in field guides.

It is important to note, however, that Miller's list of preferred common names is by no means the last word on the subject. (Even the bird checklist is now in its sixth edition.) The butterfly list may have been built on the cooperative efforts of many people, but only a few of these were responsible for any one taxonomic section. Nonetheless, the butterfly list is an excellent initial framework. It seems reasonable to suggest that, although some modification to the list is inevitable, authors that choose not to follow the list should now be required by their editors to provide reasoned justification.

I have recently had to give thought to common names for the 160 or so species of butterflies that occur in Alberta. The preferred common names of Miller's list seem eminently reasonable for all but a handful of the Alberta species. But I think three of the preferred common names are almost perversely confusing. For *Colias nastes*, the list passed over Nastes Sulphur, a name in common use at least since 1951, for the Labrador Sulphur, which was coined in 1981. The preferred name may be evocative of northern regions, but it ignores the fact that the species has a wide arctic and Cordilleran distribution, only ranging into the northernmost tip of Labrador. For *Satyrium fulginosum*, the list chose Sooty Gossamer Wing over Sooty Hairstreak, in spite of the fact that the species looks much like any other hairstreak. All other members of the genus and virtually all other members of the Hairstreak subfamily are also labelled Hairstreaks, while the only other use of the term Gossamer Wing is as a name for the Family Lycaenidae. Finally, the preferred name for *Polygonia comma* is Hop Merchant, a name that, along with Comma, has received wide use for many years. The confusion sets in when one is asked to remember that three other *Polygonia* species are kinds of Commas, and yet another three are kinds of Angelwings. With no biological basis for these common names, and only recent historical trends to justify the hodgepodge, rationalizing the common names for *Polygonia* species would be a worthwhile exercise.

In spite of these few cases, which I hope will be amended in the next edition, I enthusiastically recommend this book for all naturalists or lepidopterists with a serious interest in butterflies, as well as all libraries that maintain a good natural history section. The price (U.S. $14.95) is a bargain for anyone who is spared an hour or so of confusion, and I'm sure that will include innumerable conservationists, biogeographers, and others who want to dip into the rich lode of natural history information available for butterflies.

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SCHOLARSHIPS AND GRANTS/ BOURSES D'ÉTUDES ET SUBVENTIONS

Entomological Society of Canada Graduate Research-Travel Grants

Invitation for Applications

Preamble

To foster graduate education in entomology, the Entomological Society of Canada will offer two research-travel grants, awarded annually on a competitive basis. The intent of these grants is to help students increase the scope of the graduate training. These grants, up to a maximum of $2,000, will provide an opportunity for students to undertake a research project or to do course work pertinent to their thesis subject that could not be carried out at their own institution.

Eligibility

To be eligible, a student must:

1) be enrolled as a full-time graduate student
2) be an active member of the Entomological Society of Canada

Format of the Application Form

The application form will be in the format of a grant proposal, where the applicant will provide the following information: 1) the subject of the thesis; 2) a pertinent review of the literature in the field; 3) a concise presentation of the status of the ongoing thesis research; 4) a description of the research or course work to be undertaken, clearly indicating a) the relevance to the overall goal of the thesis, b) an explanation of why such work cannot be carried out at the student's own university and c) the justification of the site where the research/course work will be carried out; 5) a budget for the proposed project; 6) anticipated dates of travel and date on which grant money is needed.

The application form should also be accompanied by: 1) an up-to-date C.V.; 2) a supporting letter from the senior advisor; 3) When appropriate, a support letter from the scientist or Department Head at the institution where the applicant wishes to go.

Evaluation Procedure

The scientific merit of each application will be evaluated by a committee that has the option of sending specific projects out for external review by experts in the field. A constructive written report, underlining the positive and negative aspects of the proposal, will be returned to the applicant.

Timetable and Application Procedure

Application forms, which may be obtained from the Secretary of the Society, must be completed and returned to the Secretary of the Society by **15 January 1993**. The committee will evaluate all applications by 30 April 1993 and determine if, and to whom, grants will be awarded. The successful applicants will be informed immediately, thereby providing sufficient time for students wishing to start in the fall to make necessary arrangements. Grants must be used in the 12 months following the award.

Recipients must provide a short final report, as well as a detailed list of expenses, in the three months that follow the trip. Any money not spent must be returned to the Society.

La Société d'entomologie du Canada Allocations de Voyage pour Étudiants Gradués

Appels pour Allocations

Préambule

Afin the promouvoir les études graduées en entomologie, la Société d'Entomologie du Canada offrira deux bourses de voyage associées à la recherche. Celles-ci seront décernées annuellement sur une base compétitive. Le but de ces bourses est de permettre aux étudiants gradués d'élargir les horizons de leur formation. Les bourses, d'une valeur maximale de $2,000 permettront à des étudiants de réaliser un projet de recherche, ou de suivre des cours pertinents à leur sujet de thèse qui ne peuvent être entrepris dans leur propre institution.

Éligibilité

Afin d'être éligible, l'étudiant doit:

1) être inscrit à temps plein comme étudiant gradué
2) être un membre actif de la Société d'Entomologie du Canada

Format du Formulaire de Demande

Le formulaire de demande sera dans le style d'une demande d'octroi et l'étudiant devra fournir les renseignements suivants: 1) le sujet de la thèse; 2) une présentation de la littérature pertinente au domaine d'étude; 3) une présentation concise du statut du projet de recherche en cours; 4) une description de la recherche ou des cours qui seront entrepris, indiquant clairement a) la pertinence des objectifs généraux de la thèse, b) les raisons pour lesquelles ce travail ne peut être entrepris à l'université où l'étudiant est inscrit, et c) une justification concernant le choix de l'endroit où la recherche/les cours seront entrepris; 5) un budget pour le projet proposé; 6) dates prévues pour le voyage et date pour laquelle la bourse sera requise.

La demande devra aussi être accompagnée: 1) d'un C.V. complet mis-à-jour; 2) d'une lettre de recommendation du directeur de thèse; et 3) lorsque convenable, une lettre d'appui d'un administrateur de l'institution que le candidat désire fréquenter.

Évaluation

La valeur scientifique de chaque demande sera évaluée par un comité qui aura l'option d'envoyer des demandes spécifiques pour évaluation par un lecteur externe, expert dans le domaine. Un rapport écrit, contenant une critique constructive, faisant ressortir les aspects positifs et négatifs de la demande, sera retourné à chaque candidat.

Échéances et Procédures

Les formulaires de demande, qui peuvent être obtenus du Secrétaire de la Société, doivent être remplis et retournés pour **le 15 janvier 1993** au Secrétaire de la Société. Le comité évaluera toutes les demandes pour le 30 avril 1993 et déterminera si, et à qui, les bourses seront décernées. Les candidats choisis seront contactés immédiatement, cela afin d'allouer suffisamment de temps pour les préparatifs nécessaires à un départ possible à l'automne. La bourse doit être utilisée dans les 12 mois suivant l'octroi.

Les récipiendaires devront préparer un court rapport final, en plus d'une liste détaillée de leurs dépenses, dans les trois mois suivant le voyage. Tout argent non dépensé devra être remis à la Société.

PESTCON GRADUATE SCHOLARSHIP

(Established 1987)

Support of Postgraduate Work in Pesticide Research

The Pestcon Graduate Scholarship has been established from the surplus funds generated by the VIth International Congress of Pesticide Chemistry held in Ottawa, Canada in August 1986.

The Scholarship is open to Canadian students (including landed immigrants) for graduate study in any area of pesticide research including alternative pest control strategies.

The Scholarship is tenable for a period of twelve months and has a value of approximately $3,000. One Scholarship is awarded each year and may be held simultaneously with other scholarships, fellowships or awards.

Applications must be submitted in writing before **March 1** of each year, along with a curriculum vitae and brief description (500 words or less) of the research project undertaken and the progress to date. Applications must also be accompanied by an official transcript of the academic record of the candidate.

Applicants must also include the name and address of their supervisor and one other person whom they have asked to provide a confidential assessment of their ability to conduct research.

The name of the Scholarship holder will be announced prior to June 1, unless the Selection Committee feels that no suitable candidate exists.

Payment of the Scholarship will be made in two instalments, October 1 and January 1, on notification from the supervisor that the student is making satisfactory progress.

The Scholarship is administered by The Chemical Institute of Canada. All applications should be submitted to:

Program Manager, Student Affairs, The Chemical Institute of Canada, Suite 550, 130 Slater Street, Ottawa, Ontario, K1P 6E2

The British Columbia Science and Engineering Awards

The B.C. Science and Engineering Awards were established in 1980 by the Science Council of British Columbia to ensure that men and women from B.C. whose achievements are making a significant contribution to scientific knowledge receive recognition for it. Mark Winston and Keith Slessor from SFU were the 1992 recipients of this award.

Suggestions for future winners should be sent to: The Communications Department, Science Council of British Columbia, Suite 800, 4710 Kingsway, Burnaby, B.C. V5H 4M2. The nomination deadline for the 1993 B.C. Science and Engineering Awards is **March 31, 1993**.

Contact: Mark Winston, SFU Biological Sciences, (604) 291-4475
Keith Slessor, SFU Chemistry, (604) 291-4881
Jennifer Wolfe, Science Council of B.C., (604) 438-2752
Call toll free in B.C. 1-800-665-SCBC

UPCOMING MEETINGS / RÉUNIONS À VENIR

First North-South International Meeting of Information Access - ONLINE '93

March 15-19, 1993
Palacio Nacional de las Ferias (World Fair Palace), Mexico City

The National Autonomous University of Mexico through its Science and Humanities Information Center (UNAM-CICH) and Learned Information, Ltd. announce ONLINE '93. This Conference and Exhibition is made possible by the growing interest in information seeking and use ... and the easier access to, and availability of, information brought about by computer networks and CD-Roms.

CONTACT: Rosa Martha Pérez Sandi López, Executive Secretary, Mexican ONLINE '93 Committee, Circuito Exterior, Area de la Inv. Cientifica, Apartado Postal 70-392, Cd. Universitaria, Mexico, D.F. 04510, Mexico. Bitnet address: CICH@UNAMVM1. Tel. (011 525) 622-39-51; Fax. (011 525) 548-08-48.

Beltsville Symposium XVIII

May 2-6, 1993
Administration Building #003, Beltsville Agricultural Research Center, Beltsville, MD

The theme for the Eighteenth Beltsville Symposium will be *Pest Management: Biologically Based Technologies*. The Symposium will address topics that deal with the application of biologically based technologies to the management of populations of insects, weeds, nematodes and plant pathogens that are problems in modern day agriculture. The Symposium will be co-chaired by Barbara A. Leonhardt and James L. Vaughn.

CONTACT: XVIII BARC Symposium, Attn: Virginia Hupfer, Friends of Agricultural Research - Beltsville, Rm. 128, Bldg. 001, USDA Beltsville Agricultural Research Center (West), Beltsville, MD 20705-2350. Tel. (301) 505-6108; Fax. (301) 504-6357.

45th International Symposium on Crop Protection

May 4th 1993
Faculty of Agricultural Sciences, University of Ghent, Belgium

The following topics will be treated: Insecticides, Entomology, Nematology, Applied Soil Zoology, Fungicides, Phytopathology, Phytovirology, Phytobacteriology, Herbicides, Herbology, Plant Growth Regulators, Biological & Integrated Control, Residues, Toxicology, Formulations, Application Techniques. The summaries of the papers will be made available to participants in English. The proceedings will be published in the "Mededelingen Faculteit Landbouwwetenschappen Universiteit Gent".

CONTACT: Dr. ir. L. Tirry, Faculty of Agricultural Sciences, Coupure links 653, B-9000 Gent, Belgium. Tel. 32 (0)91-64-61-52; Fax. 32 (0)91-64-62-39 or 64-62-49.

41st Annual Meeting - North American Benthological Society (NABS)

May 25-28, 1993
Calgary, Alberta, Canada

The theme of the conference and plenary session will be "*Biomonitoring of Ecosystem Health: An Ecological Research Agenda*". The scientific program will consist of special invitied and contributed sessions, posters and workshops addressing not only this theme, but also other general topics related to the study of benthic organisms and environments. Abstracts are due **January 4, 1993**.

CONTACT: Janice L. Akre, NABS Scientific Program, Science Liaison Division, National Hydrology Research Institute, 11 Innovation Boulevard, Saskatoon, Saskatchewan, S7N 3H5. Tel. (306) 975-5514; Fax. (306) 975-5143

First Joint Meeting of the American Society of Limnology & Oceonography (ASLO) and the Society of Wetland Scientists (SWS)

May 30 to June 3, 1993
University of Alberta, Edmonton, Alberta

The major theme of the conference is "Freshwater, Marine and Wetland Interfaces: Dynamics and Management". Call for papers will be sent to members in late September 1992. The deadline for abstracts is **December 31, 1992**.

CONTACT: (for further details and/or to put your name on the mailing list) ASLO/SWS 1993 Conference, Environmental Research & Studies Centre, University of Alberta, CW-401L Bio Sciences Building, Edmonton, Alberta, Canada, T6G 2E9. Fax. (403) 492-8160.

MISCELLANEOUS

National Enquirer Material ...

Paul Fields of Agriculture Canada, Winnipeg (left) and Graham Thurston, a postdoctoral fellow at UC Davis (right) are living proof that behaviour (or an interest in insects) can influence phenotype. Is this (micro)evolutionary convergence?! The two entomologists do not believe that they are related to one another.

The "Fab Four" of the 1992 Executive Council .... Ringo, George, Paul and John!

Brochures Now Available

The updated brochures "Entomology in Canada" and "L'Entomologie au Canada" are now available. This is a combined and updated version of what was originally two brochures on career opportunities and the ESC. The brochure was updated by the Public Education Committee at a cost of $2161.22 for 3000 English and 1000 French brochures. We are grateful for the assistance of Françoise Harper for translation, Karen Jamieson for proof-reading, and David Hull and the Entomological Society of Ontario for loan of pre-1900 illustrations. Special thanks goes to Victoria Mervyn for her excellent design and layout.

Copies of the brochures are available at the ESC office in Ottawa (Bob Foottit) or from either Vince Nealis or Jean Turgeon, Forestry Canada, P.O. Box 490, Sault Ste-Marie, Ontario, P6A 5M7.

Vince Nealis
Public Education Committee

Please send all correspondence concerning the *Bulletin* to:

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Please copy and distribute to interested non-members. Thank you.

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