

Entomological Society of Canada Soci  t   Entomologique du Canada

Bulletin

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GUEST EDITORIAL

"What is there to Fear?"

by
G.E. Ball*

One cloudy and damp summer afternoon, as I worked on my field notes in a second floor room of the comfortable home of good friends in México City, I happened to glance out the window and saw on the sidewalk below two persons whom I took to be a mother and child, crouched on the pavement. A few possessions were beside them. Their rough clothing indicated that they were impoverished, and they were obviously not residents of this wealthy section of the city.

With her fingers, she was deftly grooming his hair. There was something comforting about that scene, for the bond of affection implied in the gentleness and care of grooming seemed palpable, even from a distance. I looked away, for it is embarrassing to one from our rather sophisticated culture and way of life that is so distant from nature to observe such intimacy, though I suspect that the woman would not have been embarrassed to know that I had seen her thus engaged.

But there was something else about that grooming that caught my attention. I had seen, on other occasions and in other places, the same sort of thing taking place between adults and young of other species of primates. I was reminded of the numerous features shared by men and apes, a pattern of resemblance recognized more than 200 years ago by Carolus Linnaeus (1758: 20-24), who included the species to which we belong and orang-utans in the same genus, which he named *Homo*. One hundred thirteen years later, Charles Darwin (1871) hypothesized that this pattern of resemblance was the result of common ancestry shared by the large primates. Darwin had principally structural and behavioral similarities of extant primates for comparison, with fossil material limited to a few fragments of the recently described *Homo neanderthalensis*. It was not hard to imagine the intermediate forms that must have lived in the past, whose features bridged the differences between extant man and apes, but there was little evidence in the form of fossils to support this seemingly bold hypothesis of descent with modification. That now has changed: as a result of extensive and intensive work by palaeoanthropologists in India and Africa, a goodly series has been found of late Tertiary and Quaternary fossil primates, whose characters bridge many of the structural gaps that separate man from other living non-human anthropoids, and them from each other. Furthermore, recently obtained electrophoretic evidence indicates that man and other anthropoids shared a common ancestry (Bruce and Ayala, 1979) that is likely no older than Late Pliocene time.

Most biologists freely acknowledge genealogical relationships of man and other anthropoids, just as they acknowledge such relationships among other groups of organisms. They recognize that relationships among taxa are inferred, not observed. The basis of the inference is evolutionary theory. Scientists, generally, realize that the entire intellectual edifice known as "science" is a highly sophisticated system of interrelated theories, and the theory of evolution is a part of this system of thought. Evolutionary theory is central to all biology, serving as a unifying concept for this field.

Scientists know that understanding of these theories in their modern formulation is the essential underpinning of an appreciation of science. In secondary schools, generally modern concepts of the physical sciences are taught, as are modern concepts of the subdivisions of biology. This meets with approval by most segments of society. Why does the cornerstone of biology—the theory of evolution—meet with rather less approval? Recently, it has come under vigorous attack, especially in the United States, with various fundamentalist-type religious groups favoring either outright abolition of the teaching of evolution, or the presentation of "creation science" on an equal basis (see Numbers 1982: 539 for an explanation of the term "fundamentalist"). That is, a literal interpretation of the Biblical accounts of creation and early events in human history is to be taught in high school science classes as an alternative to evolutionary theory. The Institute of Creation Research has taken upon itself the task of pursuing this objective (Numbers 1982). For a detailed criticism of latter-day creationism, see Ruse (1982: 285-329).

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The general thrust of creation science is to disprove evolutionary theory, on the assumption that, if successful, the only other competing statements to explain the origin and maintenance of organismic diversity are the three somewhat conflicting accounts of creation presented in the Bible (Hallman 1982). Creation science, however, is not science. It is based on purportedly revealed truth, and is thus a part of religion, which in turn is a part of metaphysics. Creation science is thus not open to the same types of investigation as is evolutionary theory, which has its roots in physics (in the broad, philosophical use of that word) rather than in metaphysics. This was the conclusion of U.S. District Court Judge W.R. Overton (1982) in the landmark case, involving the teaching of creation science in schools in Arkansas. (For accounts of the trial, see Cracraft (1982) and Lewin (1982)). Judge Overton agreed with the plaintiff in the case, that creation science was based solely on the Bible, and was thus religion.

In the United States, teaching of religion is forbidden in public schools, on the grounds of separation of church and state (Overton 1982: 942). Thus, creation science is not to be taught in institutions supported by public funds.

In Canada, on the other hand, there is no such restriction. The Institute of Creation Research is active in this country, and no doubt pressure will develop to introduce creation science in public schools here. This has already begun (Ruse 1982: 293). However, the subject ought to be taught where it belongs: in religion courses, not in science. Cracraft (1982) explained that the present generation of creationists "perceive science as a threat, because it is uncertain, often appears immoral, and the secularism it tends to advocate is viewed as causing loss of faith". This fear is presumably the basis for attack on the theory of evolution, a subject that is emotion-charged, for it includes study of the relationships of man. I expect that if man were clearly apart from other living forms, there would be little concern about evolution. Certainly, fundamentalists are not much concerned with scientific theories that deal with matter not directly related to the origin of man.

As biologists, members of the Entomological Society of Canada need to be concerned about the possibility of introduction of creation science into high school biology courses in this country. There is little enough time as it is to deal with science, without having to treat a subject that is clearly not in this domain. There is also a principle at stake: if we have to teach a Christian creationist view of biology, will we not be vulnerable to other organizations, each with its own view of some aspect of science that requires special doctrinaire treatment? What do the non-Christian religions offer as explanations for the diversity of life forms?

As members of the scientific community, what can we tell our non-scientist friends and associates who are concerned about evolutionary theory as anti-religious? They must be assured that evolutionary theory is no more a threat to belief in a supreme deity than is any other theory used to explain and codify information already acquired, and as a tool for further discovery. They might be encouraged to understand that the idea of genealogical relationships between man and the great apes (hence "animals") does not bring with it implications of lawlessness and disregard for authority. They must be encouraged to accept that the teaching of evolutionary theory in high school biology is as important as is the teaching of quantum theory in physics and chemistry courses. They must be encouraged to understand that no person or institution would be well served if the teaching of current ideas about a field of science were to be encumbered with supposedly competing religious tenets.

What is there to fear? This was a question asked by my friend and colleague, Professor Richard C. Fox, a vertebrate palaeontologist, as a closing remark in a creation-evolution debate held two years ago in Edmonton's Jubilee Auditorium. Is it so frightening to contemplate an event that occurred several million years ago, leading to divergence of the ancestral stock of the great apes, one branch of which led to mankind? We seem to have inherited good traits from that ancestry, such as care of our young, and concern for and interest in the groups of which we are immediate members. If there is anything to fear, it is not our simian legacy, but rather some of the traits that seem to be distinctly human, such as the ability to destroy our environment beyond the point of recovery, and to torture ferociously those who happen to hold different political points of view. These traits are neither "sub-human", nor generally "animal", as they are designated by many authors. Fortunately, such traits are probably not inherited, and are thus subject to change brought about, I hope, by a collective act of will.

We need to fear attitudes of ignorance that would deny to future generations a system of concepts that is as well founded as is the theory of evolution, or that would insist on devoting equal school time ostensibly devoted to science, to learning about one theory of the origin of diversity established in another age, when little was known about the biota of the world (see also Herreid (1982)). Pressure to adopt such attitudes must be resisted.

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GOVERNING BOARD MEETINGS

November 28-29, 1982

Royal York Hotel, Toronto, Ontario

Minutes

The meeting was called to order at 9:05 a.m. on November 28 by President G.B. Wiggins. Those present were: G.B. Wiggins, President; G.E. Ball, First Vice-President; R.F. Morris, Second Vice-President; S.R. Loschiavo, Past-President; P. Benoit, W.G. Friend, G.H. Gerber, R.D. McMullen and A.D. Tomlin, Directors-at-Large; B.D. Frazer (E.S.B.C.), J.A. Shemanchuk (E.S.A.), P.W. Riegert (E.S.S.), T.D. Galloway (E.S.M.), R. Harmsen (E.S.Q.), P.P. Harper (S.E.Q.), R.H. Storch (A.E.S.), Directors from Affiliates; D.C. Eldt, Scientific Editor; H.J. Liu, Bulletin Editor; H.G. Wylie, Secretary; J.M. Campbell, Chairman, Finance Committee; J.A. McLean, Observer.

P.W. Riegert moved, G.H. Gerber seconded that the Agenda be accepted. *Carried*.

1. Notice of Meeting

Notices for this meeting were mailed on May 3 and August 31, 1982.

2. Proxies and Absences

Dr. J.M. Campbell substituted for Dr. E.C. Becker, Treasurer.

3. Minutes of the Governing Board Meeting of October 3-4, 1981

G.H. Gerber moved, J.A. Shemanchuk seconded that these minutes be accepted as circulated. *Carried*.

4. Minutes of the Governing Board Meeting of October 8, 1981

S.R. Loschiavo moved, G.E. Ball seconded that these minutes be accepted as circulated. *Carried*.

5. Minutes of the Interim Executive Council Meeting of April 27-28, 1982

G.E. Ball moved, B.D. Frazer seconded that these minutes be accepted as circulated. *Carried*.

Supplementary expenses approved by the Executive Council were discussed.

Student Mixer (5.1, April 27-28, 1982): G.B. Wiggins explained that the usual ESC contribution of \$2500.00 toward expenses of the annual meeting had not been used; the contribution of \$350.00 requested as the ESC share in a joint student mixer was charged to this item on the budget. No precedent had been set, because a mixer of the type proposed for 1982 would not make sense for the small number of students attending a regular ESC annual meeting.

Symposium on Insect Physiology (5.1, April 27-28, 1982): G.B. Wiggins stated that only \$150.00 of \$500.00 approved had been spent. G.E. Gerber expressed concern that a precedent would be set by approving this supplemental expense.

W.G. Friend moved, G.E. Ball seconded that this expense be approved. Carried.
Science Fair Award Winner (5.2.12.1, April 27-28, 1982): As Award Winner David Schneider is attending the University of Toronto, the ESC expense in assisting him to attend the ESA-ESC-ESO meeting is approximately \$30.00

P.W. Riegert moved, R. Harmsen seconded that this expense be approved. Carried.

Insect Common Names and Cultures Committee (5.2.23, April 27-28, 1982): G.B. Wiggins reported that only \$244.00 of the \$500.00 approved was spent.

S.R. Loschiavo moved, R. Harmsen seconded that this expense be approved. Carried.

Public Education Committee of ESM (5.2.12.2, April 27-28, 1982): T.D. Galloway reported that the grant of \$200.00 but not the additional \$515.00 was received by ESM.

Request for Managing Editor to attend ESA-ESC-ESO meeting: D.C. Eidt stated that the Managing Editor's attendance enabled discussions with the ESA Managing Editors. An expense of approximately \$400.00 was estimated.

B.D. Frazer moved, G.H. Gerber seconded that this expense be approved. Carried.

It was agreed that Committees should endeavour in their budgets to predict all of their expenses for the next year, and thereby avoid having to request supplemental funds.

6. Business arising from Previous Minutes

6.1 *Achievement Awards* (4.4, October 8, 1981): G.B. Wiggins reported that the number and documentation of nominations improved in 1982.

6.2 *Biological Control Proposal* (4.3, April 27-28, 1982): Preparation of a proposal for DSS by the ad hoc Committee will commence after a review of biological control is published by the Commonwealth Agricultural Bureaux in 1983. The Board will ensure that this proposal deals with pathogens as well as parasites and predators.

6.3 *Copyrighted Journals and Publication Grants* (5.2.4, April 27-28, 1982): J.M. Campbell reported that Canadian copyright laws are being revised and that no change was required at this time in the status of the Canadian Entomologist to ensure eligibility for NSERC grants.

6.4 *Manuscript by Dr. Hagley* (5.2.6, April 27-28, 1982): This manuscript was published in the Vineland Station Bulletin.

6.5 *Director for National Museum of Natural Sciences* (6.6, April 27-28, 1982): G.B. Wiggins wrote to the Chairman of the NMNS Directorial Search Committee, urging that the Director to be appointed have a Science background.

7. New Business

7.1 Correspondence

G.B. Wiggins wrote expressing best wishes on the 150th anniversary of the Société entomologique de France.

J.A. Shemanchuk moved, R.D. McMullen seconded that the Board reach a decision at the next Governing Board Meeting on R.W. Stark's request that ESC review papers prepared for a CANUSA Symposium on Spruce Budworm. Carried.

7.2 Reports from Officers, Trustees and Committees

G.E. Ball moved, G.H. Gerber seconded that these reports be received. Carried

7.2.1 Executive Council

G.B. Wiggins represented the Society at meetings of BCC, SCITEC, the Biological Survey, the Entomological Society of America (1981) and the Acadian Entomological Society (1982); G.E. Ball did so at the annual meetings of the Entomological Society of Manitoba (1981), British Columbia (1982) and Alberta (1982); and S.R. Loschiavo represented ESC at annual meetings of the Entomological Society of Saskatchewan (1981), Ontario (1981) and Manitoba (1982).

7.2.2 Secretary

No action was necessary.

7.2.3 Treasurer

J.M. Campbell reported that a 1-year publication grant application was submitted to NSERC. The Society may request a 3-year grant in the future.

G.B. Wiggins wondered why a special publication fund could not be treated as a separate budget item. J.M. Campbell stated that income from publishing "Arctic Arthropods" could be determined at any time, but separate accounting for each publication would be costly and complicated.

J.M. Campbell reported a number of contributions to the Scholarship Fund in honour of Dr. J. McIntock. The Treasurer is notifying the family about these contributions.

It was suggested that Committees request extra funds in their budget if they expect to publish long reports in the Bulletin.

In response to their request, E.C. Becker will obtain a replica of the Gold medal, in a cheaper metal and without inscription, for the Public Archives of Canada.

7.2.4 Finance Committee

J.M. Campbell will inform the subcommittee seeking a more flexible fee structure for the Memoirs that the subscription rate can be changed only after changing the Society's Standing Rules.

Action: J.M. Campbell

J.M. Campbell recommended that authors of large manuscripts prepared on word processors submit the disc as well as the corrected manuscript after incorporating reviewer's comments. A notice to this effect should be placed in the Bulletin and on the cover of the Canadian Entomologist.

G.H. Gerber moved, T.D. Galloway seconded that the Publications Committee consider this recommendation. Carried.

Action: Publications Committee

It was noted that a separate budget may be required by the managing Editor, Miss McBride or by another editor for editing large publications of the Society.

G.H. Gerber moved, R.H. Storch seconded that the Executive Council ensure that funds are available for additional editing. Carried.

Because of the Society's projected deficit in 1983 (approximately \$33,000.00) the need to increase fees and subscription costs for the Canadian Entomologist and Memoirs was recognized. The possibility of having NSERC take over publication of the Canadian Entomologist was rejected.

G.H. Gerber moved, A.D. Tomlin seconded that the charge for publication in the Canadian Entomologist be \$75.00 for each page, effective for manuscripts received after January 1, 1984. Carried.

R. Harmsen moved, W.G. Friend seconded that in 1983 authors be charged \$45.00 per page for NSERC grants of \$27,000.00 or more, and that page charges be prorated up to \$59.00 for grants of less than \$27,000.00. Carried.

G.H. Gerber moved, R. Harmsen seconded that the price of back issues of the Canadian Entomologist be \$70.00 per volume or \$7.00 per number, effective January 1, 1983. For volumes prior to this date Memoirs will be included if available. Carried.

J.A. Shemanchuk moved, T.D. Galloway seconded that effective January 1, 1984 regular membership fees be increased to \$45.00 and student fees to \$20.00; that annual subscriptions to the Canadian Entomologist increase to \$85.00; and that annual subscriptions to Memoirs increase to \$24.50 for members and to \$35.00 for subscribers. Carried.

The possibility of reducing the Governing Board's costs, by having a smaller Governing Board, paying only part of the expenses of Board members attending meetings, using a telephone conference call for the interim meeting, and asking Affiliates to pay for travel of their Directors to ESC meetings was discussed.

S.R. Loschiavo moved, R. Harmsen seconded that the Executive Council set up an ad hoc Committee to determine ways of reducing Governing Board expenses. Carried.

Moved by G.H. Gerber, seconded by R.F. Morris that Mrs. Mary Lawson's work time be increased from 0.6 to 0.8 person/year effective September 1, 1982.

7.2.4.1 Requirement for Computer or Word Processor

A subcommittee appointed by the Finance Committee will report

by March 1983 on the feasibility of purchasing a small computer or word processor for the Society's business office.

7.2.4.2 Supplemental Charge for shipping Canadian Entomologist to foreign subscribers

G.E. Ball moved, R.H. Storch seconded that subscribers in the U.S.A. to the Canadian Entomologist pay an annual surcharge of \$5.00, identified as a postal charge, and that all other foreign subscribers pay a \$10.00 surcharge. Carried.

7.2.5 Scientific Editor

D.C. Eldt reminded the Governing Board that it might be impossible to find a volunteer to serve as the next Editor, and that free physical facilities and services might not be available as at present.

Moved by J.A. Shemanchuk, seconded by P.W. Riegert that the Publications Committee consult with the Finance Committee on this problem, and report to the Governing Board at the next annual meeting. Carried.

Action: Publications Committee, Finance Committee

7.2.6 Publications Committee

The Governing Board supported the appointment of Dr. Conrad Cloutier as an Associate Editor of the Canadian Entomologist.

T.D. Galloway reported that a circular distribution service to *Antenna* or *Polar Record* was the most cost-effective way of advertising to increase sale of Arctic Arthropods. The Publications Committee will determine whether additional advertising can be arranged and whether Entomological Reprint Specialists would be prepared to distribute the book and at what commission. The Committee will provide a list of potential dealers and an estimate of advertising cost to the Finance Committee.

Action: Publications Committee

G.H. Gerber moved, T.D. Galloway seconded that the Executive Council be empowered to take action on recommendations from the Publications Committee on advertising for Arctic Arthropods. Carried.

7.2.7 Bulletin Editor

H.J. Liu recommended a type-setting rather than a camera-ready process for preparing the Bulletin, because it requires less time and produces a better quality product. Annual cost would be about 45% higher for type-setting. Deadlines for receipt of material by the Bulletin Editor would have to be on the 1st instead of the 15th of February, May, August and November.

A.D. Tomlin moved, J.A. Shemanchuk seconded that the Bulletin Editor have the option of using the type-setting method to prepare the next four issues of the Bulletin. Carried.

Action: H.J. Liu

The Board felt that the June, September and December Bulletins could be delayed so that the Bulletin and Canadian Entomologist were put in the same envelope to reduce postal costs. However, the March Bulletin should not be delayed because it contains names submitted by the Nominating committee for elected positions. Members require this information if they intend to make other nominations before the deadline on April 30.

7.2.7.1 Deadlines for submitting material to Bulletin Editor

G.H. Gerber moved, B.D. Frazer seconded that the deadlines for submitting material to the Bulletin Editor be the 1st of February, May, August, and November. Carried.

7.2.7.2 Assistant Bulletin Editor — By-Law Change.

G.H. Gerber moved, A.D. Tomlin seconded that Dr. B.K. Mitchell be made a Trustee of the Society. This involves a By-Law Change requiring approval of the Membership on the 1983 ballot.

Action: H.G. Wylie

7.2.8 Annual Meeting Committee, 1982

No action was necessary.

7.2.9 Annual Meeting Committee, 1983 (Regina)

P.W. Riegert reported that this meeting will be at the Sheraton Hotel on October 1-5, 1983. Three days of scientific meetings (October 3-5) will have the theme "Integrated Pest Management". Speakers for various sections have been confirmed.

7.2.10 Annual Meeting Committee, 1984 (St. Andrews)

The theme of this meeting, at the Algonquin Hotel on October 1-4, 1984 will be "Entomological Perspectives in Resource Management". R.H. Storch will notify the Board whether all of the four dates are for scientific sessions.

Action: R.H. Storch

7.2.11 Annual Meeting, 1985

The possibility of ESC participating in the BCC Congress at London, Ontario on June 23-29, 1985 was discussed. Several Board members believed that attendance of entomologists at this meeting would be limited because of field work. The two Governing Board meetings and Annual General Meeting of ESC must be held later in the year after the ESC election results are known. If a second scientific meeting was also held later in the year, attendance of entomologists might be reduced at both meetings.

R. Harmsen moved, T.D. Galloway seconded that the ESC hold its annual meeting in 1985, complete with scientific sessions, as usual, at the normal time of year, but cut back to 2 days of scientific sessions; furthermore, that in June the ESC meet with the BCC constituent Societies (as invited), and in preparation for that form a program committee within the ESC to develop a contribution to the scientific program of the Canadian Biological Congress, as deemed appropriate to the overall program as it will be developed; as well as send an official delegation with the authority to represent the ESC and to communicate with the BCC and other constituent Societies. Carried.

G.H. Gerber moved, J.A. Shemanchuk seconded that the ESC have an independent annual meeting in 1985. Carried

P.W. Riegert moved, R. Harmsen seconded that the Executive Council be empowered to select a site for the 1985 annual meeting. Carried.

7.2.12 Science Policy Committee

Dr. Slotin will notify ESC when the Federal Cabinet responds to the Task Force on Biotechnology regarding licensing of microbial insecticides.

The Science Policy Committee will continue monitoring progress by the Federal Government in increasing the percentage of the GNP invested in Research and Development.

7.2.12.1 Federal Entomology Research on Renewable Resources

R.F. Morris moved, W.G. Friend seconded that the report of this subcommittee be published in the Bulletin, and that the publication be distributed. Carried.

7.2.12.2 Entomology Curricula in Canadian Universities

G.E. Ball moved, A.D. Tomlin seconded that a condensed version of the report of this subcommittee be published in the Bulletin and that the publication be distributed. Carried.

7.2.12.3 Support of entomological research by provincial Governments

G.E. Ball will write to the Presidents of the Affiliates, suggesting that each Affiliate form its own Science Policy Committee.

7.2.12.4 SCITEC

Dr. S.B. Hill will continue as ESC representative to SCITEC until there is enough information for ESC to decide on corporate membership in SCITEC.

7.2.12.5 BCC

G.B. Wiggins asked for written comments from Board members on the BCC brief *Biological Research in Federal Laboratories*.

Action: Governing Board

7.2.12.6 CNCIAWPR

The Society will continue having a representative to this organization next year, and will ask that he report more fully on the scientific activities of CNCIAWPR at the next annual meeting of the Society.

Attention: G.E. Ball

7.2.13 Public Education Committee

There has been little response from the Science Writers Association of Canada.

7.2.13.1 Science Fair Prizes

Science Fair winner David Schneider will attend the scientific meeting on December 1. A.D. Tomlin is in charge of his visit.

It was felt that Science Fair prizes should be awarded for outstanding achievement, not necessarily annually.

7.2.14 Scientific Committee of the Biological Survey

G.B. Wiggins reported that the research proposal on insect dormancy submitted to DSS for funding has been withdrawn because a term position provided for H.V. Danks by the NMNS until March 1984 preempts all of his time. The NMNS hopes to establish a permanent position for H.V. Danks and the Biological Survey before that interval expires. The NMNS contract with the ESC to provide a Scientific Committee continues.

P.W. Riegert moved, R. Harmsen seconded that the Society waive the requirement for membership for authors of papers to be published in the Canadian Entomologist from the Biological Survey Symposium held at the Toronto Meeting. Carried.

7.2.15 By-Laws, Rules and Regulations Committee

G.H. Gerber recommended changes to the Guidelines for the Insect Common Names and Cultures Committee.

R.F. Morris moved, P.P. Harper seconded that the Board accept these changes. Carried.

G.H. Gerber moved, P.P. Harper seconded that the Board propose changes to Standing Rule XIII, articles 1 and 2, as follows:

Article 1. The Society shall maintain a list of English and French common names of insects and related arthropods.

Article 2. The Society recognizes the common names of insects and related arthropods in the current list prepared and published by the Entomological Society of Canada.

The motion was carried.

7.2.16 Membership Committee

J.M. Campbell reported that 20 regular and 62 student members have joined the Society since the beginning of the Membership campaign.

7.2.17 Fellowship Selection Committee

The question as to whether nominations for Fellowships should be accepted from the Membership was discussed, and will be considered further at the next Board meeting.

7.2.18 Nominating Committee

No actions were necessary.

7.2.19 Elections Committee

No actions were necessary.

7.2.20 Achievement Awards Committee

No actions were necessary.

7.2.21 Scholarship Committee

No actions were necessary.

7.2.21.1 *Deadline for receipt of applications*

H.G. Wylie will ensure that there are identical scholarship application deadlines in the Bulletin and on the application forms.

Action: H.G. Wylie

7.2.21.2 *Number of scholarships in 1983*

Two scholarships will be awarded.

7.2.22 *Employment Committee*

G.B. Wiggins reported that negotiations were completed a week ago with DSS for a \$15,000.00 contract funded by the Departments of Agriculture and Environment to support the Society's *Study of entomological manpower 1976-1986*.

7.2.23 *Heritage Committee*

The Board discussed the recent questionnaire soliciting information on ESC Members, and suggested that a more efficient and cheaper method of distribution would be by way of the regular Bulletin mailing.

7.2.24 *Insect Common Names and Cultures Committee*

P.W. Riegert moved, G.H. Gerber seconded that the incoming Executive instruct this committee to maintain close liaison with the SPPQ and to compile, publish and monitor jointly a list of common names of insects and related arthropods. Carried.

7.2.25 *Insect Losses Committee*

The Board will discuss at the next Governing Board meeting a second contract to investigate costs of destructive insects on other crops.

8. *Other Business*

8.1 *Proposed standing rule for supplementary expenses*

G.H. Gerber moved, P.W. Riegert seconded that the Board propose a new Article (3e) for Standing Rule VI to the Membership, to cover unforeseen expense items: In years when there is no mid-term meeting of the Board, the Treasurer may pay, without reference to the Board, the costs of unforeseen items which have not been included in the Society's budget, provided that these items (i) have been approved by the Executive Council and (ii) are consistent with the objects of the Society. The total costs of these items shall not exceed one percent (1%) of the projected total revenue for the year as stated in the Society's budget.

The motion was carried.

It was agreed that the function of the President's Discretionary Fund would be met by the new allowance for supplementary expenses. J.A. Shemanchuk moved, P.W. Riegert seconded that the President's Discretionary Fund be discontinued. Carried.

8.2 *COPSE*

No actions were necessary.

8.3 *17th International Congress of Entomology*

This will be held at Hamburg, Germany during August 18-26, 1984.

8.4 *"School Ties"*

J.A. Shemanchuk moved, P.W. Riegert seconded that the Society investigate obtaining and selling ties with the ESC emblem. Carried.

Action: Executive Council

8.5 *Canadian Entomologists and Entomological History*

The new Executive in collaboration with the 1983 Annual Meeting Committee will investigate the possibility of having a speaker honour a Canadian entomologist, entomological event or entomological research institution at the 1983 meeting.

Action: Executive Council; 1983 Annual Meeting Committee

8.6 *Symposium: Economics of Entomological Effort*

It was agreed that the Society would not publish the papers presented in this Symposium at the Banff Meeting.

8.7 *Any other business*

H.G. Wylie will reply to Dr. R. Brust, indicating that contributions may be made to the Scholarship Fund in memory of Dr. J. McLintock.

Action: H.G. Wylie

G.B. Wiggins expressed the Board's thanks to retiring Board Members, Dr. S.R. Loschiavo and Dr. W.G. Friend.

9. The next Governing Board Meeting will be held at the Royal York Hotel on Friday, December 3rd at 1:30 p.m.

The Meeting adjourned at 5:45 p.m. on November 29, 1982.

Actions

1. *Supplementary Expenses*

Approved supplementary expenses recommended by the Executive Council.

2. *Biological Control Proposal*

Reported that preparation of this proposal to DSS will commence in 1983 after a review of biological control is published by the Commonwealth Agricultural Bureaux.

3. *Executive Council*

The President reported that the Society was represented at meetings of affiliate societies, umbrella societies (BCC and SCITEC), the Scientific Committee of the Biological Survey, and at international meetings.

4. *Treasurer*

Reported that a 1-year publication grant application was submitted to NSERC.

5. *Finance Committee*

- (1) Agreed to ensure that supplementary funds are made available for editing large manuscripts to be published by the Society.
- (2) Agreed to recommend to the Membership, at the Annual General Meeting, increases in the page charges for the Canadian Entomologist; in the cost of back issues of the Canadian Entomologist; in regular and student membership dues; and in annual subscriptions to the Canadian Entomologist and to the Memoirs.
- (3) Asked the Executive Council to set up an ad hoc Committee to investigate the possibility of reducing expenses of the Governing Board.
- (4) Agreed that Mrs. Mary Lawson's work time, as assistant to the Treasurer, be increased from 0.6 to 0.8 person/year, effective September 1, 1982.
- (5) Heard from J.M. Campbell that a subcommittee is investigating the feasibility of purchasing a smaller computer or word processor for the Society's business office.
- (6) Agreed that subscribers in the U.S.A. should pay an annual surcharge of \$5.00, identified as a postal charge, and that all other foreign subscribers pay a \$10.00 surcharge.

6. *Scientific Editor*

Asked the Publications Committee and Finance Committee to estimate and report on expenses likely to be incurred if future Scientific Editors are not volunteers and cannot provide free physical facilities and services to the Society.

7. *Publications Committee*

- (1) Supported appointment of Dr. Conrad Cloutier as an Assistant Editor of the Canadian Entomologist.
- (2) Requested that the Publications Committee determine whether additional advertising can be arranged for Arctic Arthropods.

8. *Bulletin Editor*

- (1) Agreed that the Bulletin Editor should have the option of using a typesetting method to prepare the next four issues of the Bulletin.
- (2) Agreed that the deadlines for submitting material to the Bulletin should be the 1st instead of the 15th of February, May, August and November.

- (3) Agreed that Dr. B.K. Mitchell (Assistant Bulletin Editor) be made a Trustee of the Society.
9. *Annual Meetings*
- (1) Heard from P.W. Riegert that the 1983 Annual Meeting with the ESS will be held in Regina during October 1-5, with the theme "Integrated Pest Management".
 - (2) Heard from R.H. Storch that the 1984 Annual Meeting with the AES will be held in St. Andrews, New Brunswick during October 1-4, with the theme "Entomological Perspectives in Resource Management".
 - (3) Agreed that in 1985 the Society's Annual Meeting will consist of a 2-day scientific session and business meeting at the usual time, at a site to be determined by the Executive Council. In addition, the Society will meet in June 1985, with other constituent Societies of the Biological Council of Canada, in London, Ontario, as invited. For the latter meeting, the Society will form a program committee to develop a contribution to the scientific program of the meeting, and will send an official delegation.
10. *Science Policy Committee*
- (1) Agreed that the Science Policy Committee continue monitoring progress by the Federal Government in increasing the percentage of the GNP in R&D.
 - (2) Agreed to publish in the Bulletin the brief of the subcommittee investigating Federal Government Research in Entomology on Renewable Resources, and a condensed version of the report of the subcommittee investigating Entomology Curricula in Canadian Universities.
 - (4) Agreed to send representatives to SCITEC and CNCIAWPR in 1983.
11. *Public Education Committee*
- Agreed that Science Fair prizes should be awarded for outstanding achievements, not necessarily annually.
12. *Scientific Committee of the Biological Survey*
- Agreed to waive requirement for membership for authors of papers in the Biological Survey Symposium at the Toronto Meeting.
13. *By-Laws, Rules and Regulations Committee*
- Agreed to accept changes in the guidelines for the Insect Common Names and Cultures Committee, and proposed changes for consideration by the Membership at the Annual General Meeting in the Society's Standing Rules for this Committee.
14. *Insect Common Names and Cultures Committee*
- Agreed to instruct this Committee to maintain close liaison with the Société de Protection des Plantes du Québec and to compile, publish and monitor jointly a list of Common Names of Insects and related Arthropods of Canada.
15. *Future Supplementary Expenses*
- Agreed to propose to the Membership at the Annual General Meeting a new Article to Standing Rule VI to deal with unforeseen expenses which are not included in the Society's budget.
16. *Ties*
- Agreed to investigate the possibility of obtaining and selling ties with the ESC emblem.
17. *Speaker at 1983 Annual Meeting*
- Agreed to investigate, in collaboration with the 1983 Annual Meeting Committee, the possibility of having a speaker at the 1983 Annual Meeting honour a Canadian entomologist, entomological event or entomological research institute.
18. *Papers from Banff Symposium*
- Agreed that the Society should not publish the papers presented in the Symposium "Economics of Entomological Effort" at the Annual Meeting held in Banff in 1981.

December 3, 1982
Royal York Hotel, Toronto, Ontario
Minutes

The meeting was called to order at 1:30 p.m. on December 3 by President G.E. Ball. Those present were: G.E. Ball, President; R.F. Morris, First Vice-President; S.B. McIver, Second Vice-President; G.B. Wiggins, Past President; P. Benoit, J.M. Campbell, G.H. Gerber, J.A. McLean, R.D. McMullen and A.D. Tomlin, Directors-at-Large; B.D. Frazer (ESBC), J.A. Shemanchuk (ESA), P.W. Riegert (ESS), R. Harmsen (ESO), P.P. Harper (SEQ), R.H. Storch (AES), Directors from Affiliates; D.C. Eidt, Scientific Editor; H.J. Liu, Bulletin Editor; E.C. Becker, Treasurer; H.G. Wylie, Secretary.

1. Notice of Meeting

Notices of the meeting were mailed on May 31 and August 31, 1982.

2. Proxies and Absences

T.D. Galloway was unable to attend.

3. Minutes of Governing Board Meeting of November 28-29, 1982

The Minutes will be prepared and mailed by the Secretary.

4. Business arising from previous Minutes

4.1 Nomination of Fellows

G.H. Gerber moved, A.D. Tomlin seconded the following motion:

The Fellowship Selection Committee shall nominate Fellows from a list of names gathered by the Fellowship Selection Committee and from a list of names submitted by Active and Special Members of the Society. Active and Special Members are permitted to submit names to the Fellowship Selection Committee for consideration as Fellows of the Society; the names shall be submitted over the signatures of at least four (4) Active or Special Members of the Society. The Fellowship Selection Committee shall publish a notice in the Bulletin of the Society calling for the submission of names by Active and Special Members of the Society for consideration as Fellows of the Society.

Motion Carried

4.2 List of English Common Names of Insects

G.E. Ball asked Board Members who received copies of the list to return them, with any suggested changes, to Dr. Watson. A Directive will be sent to Dr. Watson in regard to combining this list and the list of French Names into an official ESC list of Common Names.

Action: G.E. Ball

4.3 Request from Dr. Stark

G.E. Ball reported that the Publications Committee had recommended rejection of Dr. Stark's request for ESC assistance in reviewing papers for a CANUSA Symposium, because the same pool of experts would review the papers regardless of whether ESC was involved.

R. Harmsen moved, G.H. Gerber seconded that the ESC politely reject the request to review the CANUSA Symposium papers, and indicate to Dr. Stark that the entire Proceedings could be considered for publication as a Memoir of ESC. Carried.

4.4 Reducing Governing Board Expenses

G.E. Ball reported that an ad hoc Committee, not including members of the Board, had been set up to look into the matter.

4.5 Meetings in 1985

G.E. Ball reported that an ad hoc Committee headed by G.B. Wiggins would co-ordinate ESC participation in the BCC Meeting in June 1985.

Considerable discussion ensued about the second ESC meeting.

J.M. Campbell moved, A.D. Tomlin seconded that ESC invite ESM to meet with it in 1985, or invite another Affiliate if ESM is unable to participate. The motion was defeated.

It was agreed that the Executive Council would make arrangements for the second meeting in 1985.

4.6 *Insect Losses Committee*

G.H. Gerber moved, J.A. Shemanchuk seconded that the Executive Council appoint a Committee to prepare a second proposal to DSS dealing with the costs of destructive insects on other crops, to be determined by the Committee. Carried.

F. L. McEwen, who chaired the first phase of the study, will be unable to handle the second contract.

It is hoped that the proposal will be ready for examination by the Board at the next Governing Board Meeting.

5. *New Business*

5.1 *Appointments*

5.1.1 *Executive Council*

G.E. Ball announced that the Executive Council for 1982-83 will be G.E. Ball, President; R.F. Morris, First Vice-President; S.B. McIver, Second Vice-President; G.B. Wiggins, Past-President.

5.1.2 *Trustees*

B.D. Frazer moved, P.W. Riegert seconded that the Trustees of the Society be E.C. Becker, Treasurer; D.C. Eldt, Scientific Editor; C.A. Miller, Assistant Scientific Editor; H.J. Liu, Bulletin Editor; B.K. Mitchell, Assistant Bulletin Editor; H.G. Wylie, Secretary. Carried.

5.1.3 *Committees and Representatives*

P.W. Riegert moved, J.M. Campbell seconded that the Board approve the list of Committee members and representatives prepared by the President. Carried.

5.2 *Budget*

The Treasurer presented a budget to the Board.

S.B. McIver moved, J.A. Shemanchuk seconded that the budget be accepted. Carried.

6. *Other Business*

R. Harmsen reported that ESO has decided to form its own Science Policy Committee to seek additional support for entomological research.

7. *Time of next Governing Board Meeting*

The next Governing Board Meeting will be held at the Sheraton Hotel, Regina on October 1, 1983. The mid-term meeting of the Executive Council will be held in Ottawa in April 1983.

8. *Adjournment*

J.A. Shemanchuk moved, R. Harmsen seconded that the meeting be adjourned.

The meeting was adjourned at 3:20 p.m.

Actions

1. *Executive Council*

Approved the Executive Council for 1982-83 as proposed: G.E. Ball, President; R.F. Morris, First Vice-President; S.B. McIver, Second Vice-President; G.B. Wiggins, Past President.

2. *Trustees*

Approved the Trustees for 1982-83 as proposed: E.C. Becker, Treasurer; H.G. Wylie, Secretary; D.C. Eldt, Scientific Editor; C.A. Miller, Assistant Scientific Editor; H.J. Liu, Bulletin Editor; B.K. Mitchell, Assistant Bulletin Editor.

3. *Committees and Representatives*

Approved Committees and Representatives for 1982-83 as proposed by the President; a list will be published in the Bulletin.

4. *Nomination of Fellows*

Agreed to invite Active and Special Members of the Society to submit names to the Fellowship Selection Committee for consideration as Fellows. The Fellowship Selection Committee shall nominate Fellows from these names and from a list of names gathered by the Fellowship Selection Committee.

5. *List of English Common Names of Insects*

Agreed to return copies of this list with suggested changes to W.Y. Watson, Chairman of the Insect Common Names and Cultures Committee.

6. *Papers for CANUSA Symposium*

Agreed to decline the request to review papers for this Symposium, and to indicate that the Symposium Proceedings could be considered for publication as an ESC Memoir.

7. *Governing Board Expenses*

G.E. Ball reported that an ad hoc Committee has been set up to investigate the possibility of reducing Governing Board expenses.

8. *Meetings in 1985*

Reported that an ad hoc Committee headed by G.B. Wiggins will co-ordinate ESC participation in the meeting with the Biological Council of Canada in June 1985.

Agreed that the Executive Council would arrange for a second meeting at the usual time, consisting of scientific sessions and business meetings.

9. *Insect Losses Committee*

Asked the Executive Council to appoint a Committee to prepare a second proposal to DSS dealing with the cost of destructive insects on other crops, to be determined by the Committee.

10. *Budget*

Approved a budget for 1983 as presented by the Treasurer.

11. *Mid-Term Executive Council Meeting*

Agreed that this Meeting will be held in Ottawa in April 1983.

12. *Annual Meeting of the Governing Board*

Announced that the next Governing Board Meeting will be held at the Sheraton Hotel, Regina on October 1-2, 1983 during the joint ESC-ESS Meeting.



Governing Board Meeting of December 3, 1982, Royal York Hotel, Toronto, Ontario. Seated, left to right: G.B. Wiggins, R.F. Morris, G.E. Ball, S.B. McIver, H.G. Wylie, Standing, from left to right: E.C. Becker, R.H. Storch, G.H. Gerber, P. Benoit, B.D. Frazer, J.A. Shemanchuk, P.W. Riegert, H.J. Liu, J.M. Campbell, R. Harmsen, R.D. McMullen, A.D. Tomlin, J.A. McLean, D.C. Eidt, P.P. Harper. (Photograph, D.J. Hamilton).

ENTOMOLOGICAL SOCIETY OF CANADA BUDGET 1983

<i>Receipts</i>	<i>Can. Ent.</i>	<i>Memoirs & Other Pub.</i>	<i>Society</i>	<i>Total</i>
Members-regular 800 @ \$35	\$14,000	\$	\$14,000	\$ 28,000
-student 200 @ \$10			1,000	2,000
-sustaining				
Subscriptions 1,000 @ \$70	45,000	25,000		70,000
Can. Ent.-page charges 1,144 @ \$45	51,480			51,480
-reprints	11,000			11,000
Memoirs-students 20 @ \$17.50		350		350
-members 150 @ \$17.50		2,625		2,625
-page charges 1,200 @ \$45		54,000		54,000
-sales, individual copies		4,100		4,100
Back issues @ \$70 per vol.	4,000			4,000
Advertising in Bulletin			200	200
Arctic Arthropods & Bibliography		4,500		4,500
Government grant	30,000			30,000
Interest-bonds			21,500	21,500
-bank			8,500	8,500
Sundry income			500	500
Overhead recovery from contracts			600	600
	<hr/>	<hr/>	<hr/>	<hr/>
	\$156,480	\$90,575	\$46,300	\$293,355
<i>Disbursements</i>				
Can. Ent.-publishing	\$83,000	\$	\$	\$83,000
-reprints	8,000			8,000
-mailing & handling	17,000			17,000
Bulletin-publishing			10,100	10,100
-mailing with Can. Ent.			400	400
Memoirs-publishing (4 for 1,200 pp)		78,000		78,000
-mailing & handling		8,000		8,000
Office expenses	7,200	78	7,200	14,478
Audit	750		750	1,500
Gold medal, trophy, brochures			1,500	1,500
Executive discretionary fund			3,000	3,000
Editorial expenses-other	1,000			1,000
Committees-Education (incl. reg. soc.)			800	800
-Science policy			2,500	2,500
-Common Names			400	400
-Employment			700	700
-Finance			100	100
-Membership				
Support of other organizations				
-B.C.C.			3,500	3,500
-S.C.I.T.E.C.			400	400
-T.I.E.G.			300	300
-C.N.C.I.A.W.P.R.			50	50
Governing Board-annual meeting			16,000	16,000
-interim meeting			3,000	3,000
-other meetings			1,500	1,500
Annual meeting-grant			2,500	2,500
-honorees expenses			2,000	2,000
Trustees, unaccountable expenses			2,900	2,900
Salaries-managing editor	35,348	3,927		39,275
-clerk	6,000	885	10,000	16,885
-secty. assist. (editor)	1,800			1,800
-secty. assist. (secretary)			500	500
-casual help	1,000			1,000
Employee benefits	1,875	200	425	2,500
Advertising for publications		750		750
Inserts in Bulletin			1,634	1,634
Sundry	500		500	1,000
	<hr/>	<hr/>	<hr/>	<hr/>
	\$163,473	\$91,840	\$72,659	\$327,972
NET INCOME (LOSS) FOR YEAR	(\$ 6,993)	(\$ 1,265)	(\$26,359)	(\$ 34,617)

Above budget approved by the Governing Board, 3 December 1982

32nd. ANNUAL GENERAL MEETING

December 3, 1982
Royal York Hotel, Toronto, Ontario

Minutes

President G.B. Wiggins called the meeting to order at 8:35 a.m. There were 48 persons in attendance.

G.E. Ball moved, G.H. Gerber seconded that the Agenda be accepted as circulated. Carried.

1. *Notice of Meeting*

The notice of this meeting was published in the Bulletin, vol. 14, June 1982.

2. *Proxies*

None were recieved.

3. *Deceased Entomologists*

A minute of silence was observed in the memory of G.E. Bucher, G. Hammond, M.T. James, J.R. McLintock and J. Schuh.

4. *Minutes of the 31st Annual General Meeting (1981)*

The minutes were published in the Bulletin, vol. 13, December 1981.

J.A. Shemanchuk moved, R.D. McMullen seconded that the Minutes be accepted as published. Carried.

5. *Business arising from the Minutes*

G.B. Wiggins reported that, in response to dissatisfaction with the auditor's methods of reporting, a new auditor had been appointed, auditing and accounting procedures changed into a consistent format, and the 1981 audit repeated.

6. *Report of the Governing Board*

President G.B. Wiggins presented a report, which will be published in the Bulletin.

R.F. Morris moved, D.M. Davies seconded that the President's report be accepted. Carried.

6.1 *Changes to Standing Rules*

H.G. Wylie read the proposed changes to Standing Rules.

Standing Rule II—Dues—change articles 1 and 2

1. Annual dues for direct Regular Membership shall be *forty-five dollars (\$45.00)* (1 January 1984).

G.E. Ball moved, E.G. Munroe seconded that this change be accepted. Carried.

2. Annual dues for Student Membership shall be *twenty dollars (\$20.00)* (1 January 1984).

R.H. Storch moved, G.H. Gerber seconded that this change be accepted. Carried

Standing Rule VI, new article (3(e))—unforeseen expense items

In years when there is no mid-term meeting of the Board, the Treasurer may pay, without reference to the Board, the costs of unforeseen items which have not been included in the Society's budget, provided that these items: (i) have been approved by the Executive Council and (ii) are consistent with the objects of the Society. The total cost of these items shall not exceed one percent (1%) of the projected total revenue for the year as stated in the Society's budget.

G.H. Gerber moved, J.M. Campbell seconded that this change be accepted. Carried.

Standing Rule XII, Publications—change articles 4, 5, 7, 10, 12 and 13.

4. The annual subscription rate for the Canadian Entomologist shall be *eighty-five dollars (\$85.00) effective 1 January 1984.*

S.R. Loschiavo moved, J.A. Shemanchuk seconded that this change be accepted. Carried.

5. The charge for publication in the Canadian Entomologist shall be *seventy-five dollars (\$75.00) for each page, effective for all manuscripts received after 1 January 1984.*

G.H. Gerber moved, R.D. McMullen seconded that this change be accepted. Carried.

Amendment: D.C. Eidt moved, J.A. Shemanchuk seconded, that the change in article 5 be amended as follows:

The charge for publication in the Canadian Entomologist shall be *seventy-five dollars (\$75.00) for each page, effective for all manuscripts received after 1 July 1983.*

The main motion as amended was carried.

7. The charge for publication in the Memoirs of the Entomological Society of Canada shall be *fifty dollars (\$50.00) for each page published after 1 January 1984.*

E.C. Becker moved, J.M. Campbell seconded that this change be approved. Carried.

10. The price of back issues of the Canadian Entomologist shall be *\$70.00 per volume or \$7.00 per number, effective 1 January 1983.*

G.E. Ball moved, A.D. Tomlin seconded that this change be accepted. Carried.

12. The price to Regular and Student Members for receiving all the numbers of the Memoirs of the Entomological Society of Canada issued during a calendar year shall be *twenty-four dollars and fifty cents (\$24.50), effective 1 January 1984.*

R.H. Storch moved, R.D. McMullen seconded that this change be accepted. Carried.

13. The price to Subscribers for receiving additional subscriptions of the Memoirs of ESC issued during a calendar year shall be *thirty-five dollars (\$35.00), effective 1 January 1984.*

G.H. Gerber moved, J.M. Campbell seconded that this change be accepted. Carried.

Standing Rule XIII, Common Names—change Articles 1 and 2

1. The Society shall maintain a list of English and French common names of insects and related arthropods.

2. The Society recognizes the *common names of insects and related arthropods in the current list prepared and published by the Entomological Society of Canada.*

G.E. Ball moved, P.W. Riegert seconded that these changes be accepted. Carried.

F.L. McEwen suggested that the Finance Committee confer with Wes Henderson, Agricultural Institute of Canada about the possibility of obtaining lower page charges.
Action: Finance Committee

7. Auditor's Report

E.C. Becker presented the Auditor's Report.

E.C. Becker moved, P.W. Riegert seconded that this report be accepted. Carried.

8. Election Committee Report

H.G. Wylie read the Election Committee Report:

For 2nd Vice-President: S.B. McIver was elected.

For Directors-at-Large: J.M. Campbell and J.A. McLean were elected.

For Fellowship Selection Committee: J.A. Downes and D.K. McE. Kevan were elected.

On the Honorary Membership Ratification vote: M.D. Proverbs and A.G. Robinson were ratified.

On the matter of the By-Laws: The proposed revision was approved.

9. *Installation of New Officers*

President G.B. Wiggins turned the gavel and chair over to G.E. Ball as incoming President of the Society. The new President thanked Dr. Wiggins for his service to the Society and asked him to escort the 2nd Vice-President, S.B. McIver to the dais.

10. *Service Awards*

G.E. Ball presented Service Awards to G.B. Wiggins, Past-President and D.M. Davies, former Bulletin Editor.



G.E. Ball (left), President, Presenting Service Award to G.B. Wiggins (right), Past-President, at the 32nd Annual General Meeting of the ESC, December 3, 1982, Toronto, Ontario. (Photograph, D.J. Hamilton).

11. *Appointment of Auditors*

E.C. Becker moved, P.W. Riegert seconded that the Society retain McCay, Duff and Company as auditors for 1982. Carried.

12. *Resolutions*

G.E. Ball asked R.D. McMullen to present the following resolutions on behalf of the Society.

1. Whereas the 32nd Annual Meeting of the Entomological Society of Canada, having met jointly with the Entomological Society of America and the Entomological Society of Ontario, has enjoyed an outstanding program of information and stimulating scientific and social activities. and

whereas the success of this joint meeting has been due in a large part to the efforts and dedication of the Program Committee of the Entomological Society of America, chaired by Dr. F.L. McEwen and the Local Arrangements Committee chaired by Dr. S.B. McIver,

be it resolved therefore that the Entomological Society of Canada express its appreciation to the Entomological Society of America and commend its members and members of the Entomological Society of Ontario who served on the Joint Societies Meeting Program and Local Arrangements Committee.

2. Whereas the opportunities afforded by joint meetings of the Entomological Society of Canada and its affiliate societies with the Entomological Society of America promote better understanding of and solutions to problems of entomological nature common to all of North America, particularly those with north-south clines,

be it resolved, therefore, that the Entomological Society of Canada continue to participate in such joint meetings at reasonable intervals in the future.

3. Whereas the Royal York Hotel and its staff have provided excellent meeting rooms, organizational support, guest accommodations and courteous, efficient services for this meeting

be it therefore resolved the Entomological Society of Canada extend its appreciation to the Royal York Hotel and staff.

R.D. McMullen moved, J.A. Shemanchuk seconded that the resolutions be accepted. Carried.

13. *Other Business*

R.J. McClanahan spoke against French abstracts being mandatory in manuscripts published in English in the Canadian Entomologist, pointing out that he knew of no requirement for French abstracts and that each issue was about two pages longer from inclusion of abstracts in both official languages.

D.C. Eidt noted that, after consulting with the Publications Committee, he had arranged for French abstracts for all manuscripts, provided that the authors did not object. No objections had been registered. The Governing Board has no policy on this point.

W.J. Turnock stated that Agriculture Canada and some other Government Departments required abstracts in both official languages and suggested that scientists from Agriculture Canada who object should ask their Director to contact Dr. LeRoux.

F. L. McEwen believed that having abstracts in both languages helped to obtain publication grants from NSERC.

R.J. McClanahan moved, D.K. McE. Kevan seconded the following motion:

Whereas inclusion of a bilingual abstract in papers for the Canadian Entomologist should be entirely the prerogative of the author(s), be it resolved that the Editor and the Editorial Board be directed to accept abstracts in the lingual format in which they are submitted.

The motion was defeated.

14. *Notice of 33rd Annual General Meeting*

The meeting will be held at the Sheraton Hotel, Regina during October 1-5, 1983.

15. *Adjournment*

G.H. Gerber moved, J.A. Shemanchuk seconded that the meeting be adjourned.

The Meeting adjourned at 10:05 a.m.

33rd. ANNUAL GENERAL MEETING

Notice

The Annual Business Meeting of the Entomological Society of Canada will be held during the period October 3-5, 1983 at the Sheraton Hotel, Regina, Saskatchewan. The date and time will be announced in the June Bulletin.

Matters for the consideration of this meeting or of the Governing Board meeting, to be held on October 1 and 2, 1983 at Regina, should be sent to the Secretary, Dr. H.G. Wylie, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba, R3T 2M9.

La Réunion Annuelle d'Affaires de la Société entomologique du Canada aura lieu durant la période du 3 au 5 d'Octobre 1983, dans l'Hotel Sheraton, Regina, Saskatchewan. On annoncera le jour et l'heure dans le Bulletin de juin 1983. Ceux qui désirent soumettre des propositions pour cette Réunion ou au Conseil de Direction, voudront bien les envoyer a l'adresse donnée plus haut.

JOINT MEETING OF THE ENTOMOLOGICAL SOCIETY OF CANADA AND ENTOMOLOGICAL SOCIETY OF SASKATCHEWAN

Sheraton Centre, Regina, October 3-5, 1983

First Notice and Call for Papers

The scientific program will begin Monday, October 3 with a series of invitational papers on the theme "Integrated Pest Management". Submitted papers, poster presentations and workshops will be scheduled for October 4 and 5.

Submitted papers and poster presentations

Twelve minutes will be allotted for the presentation of each submitted paper, plus 3 minutes for discussion and speaker change. This schedule will be rigidly adhered to. An abstract of 50 words or less is required.

Poster displays should preferably be free standing for placement on a table. Prepare for the top of your poster an easily readable label bearing the title of the presentation and the name(s) of the author(s). Display tables will be assigned to authors for a certain period of time, and a number of displays will be run concurrently. An abstract of 50 words or less is required.

Workshops

Members planning to organize informal workshops should send details of proposals to the Program Chairman before June 1. When submitting proposals, provide the title, proposed moderator, anticipated attendance, and projection equipment needed. Please provide also, an estimation of the audience it is liable to attract.

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

Submit proposals to: Mr. M.G. Maw, Program Chairman, Agriculture Canada Research Station, Box 440, Regina, Saskatchewan S4P 3A2

Please type

SUBMITTED PAPER AND POSTER PRESENTATION REPLY FORM

Please mail to: Mr. M.G. Maw,
Program Chairman,
Agriculture Canada Research Station
Box 440,
Regina, Saskatchewan
S4P 3A2

Deadline: Postmarked on or before June 30, 1983.

Title (not to exceed 15 words): _____

Author's Name(s): _____

Institution and Address: _____

To Be Given By: _____

Form of Presentation Desired:

please check

- 12 Minute oral presentation,
plus 3 minutes for discussion
and speaker ☐
- Poster presentation..... ☐

Projection Equipment Required:

- 2x2 slides [slides should be
provided in a carousel (Kodak)] ☐
- Overhead projector ☐

Abstract:

Please enclose a typed abstract of 50 words or less with this form.

EXECUTIVE COUNCIL MEETING

Notice

The midterm meeting of the Executive Council of the Entomological Society of Canada will be held 12 and 13 April 1983 at the Embassy West Motor Hotel, 1400 Carling Avenue, Ottawa. Matters for consideration at the meeting should be sent to the Secretary, Dr. H.G. Wylie, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba R3T 2M9.

NOMINATIONS 1983 Elections

Second Vice-President

S.B. Hill
Department of Entomology
Macdonald College
P.O. Box 301
Ste. Anne de Bellevue, P.Q. K9X 1C0

H.F. Howden
Department of Biology
Carleton University
Ottawa, Ontario K1S 5B6

Directors-at-Large

F.M. Barrett
Department of Zoology
University of Toronto
Toronto, Ontario M5S 1A1

R.G.H. Downer
Department of Biology
University of Waterloo
Waterloo, Ontario N2L 3G1

R.F. Shepherd
Pacific Forest Research Centre
Environment Canada
506 W. Burnside Road
Victoria, B.C. V8Z 1M5

Fellowship Selection Committee

J.H. Borden
Department of Biological Sciences
Simon Fraser University
Burnaby, B.C. V5A 1S9

R.H. Burrage
1601 Arlington Avenue
Saskatoon, Saskatchewan S7H 2Y4

W.G. Friend
Department of Zoology
University of Toronto
Toronto, Ontario M5S 1A1

Additional nominations from members must be submitted *not later than 30 April 1983*, to the Secretary, Entomological Society of Canada, Dr. H.G. Wylie, Agriculture Canada Research Station, Winnipeg, Manitoba R3T 2M9.

E.G. Munroe
W.G. Wellington
G.B. Wiggins (Chairman, Nominating
Committee)

POSTGRADUATE AWARDS 1983

Notice

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

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

All communications regarding the awards should be addressed to:

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

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

Eligibility. The successful candidates must be either Canadian citizens, or landed immigrants with baccalaureates from a Canadian university. Candidates must be enrolled in their first year of postgraduate studies during the year 1983. The awards are conditional until the recipients have provided evidence that they have been accepted by a graduate school to engage, during 1983, in a programme of study and research for an advanced degree with full graduate student status. Failure to provide this evidence will result in cancellation of the award. Before the scholars may receive their award, a statement must be provided by the Dean of Graduate Studies at the university of tenure certifying that the student has been accepted for graduate studies and research with the full status of a graduate student. A scholar who enters a graduate school as a qualifying candidate is not eligible to hold a Postgraduate Award of the ESC. An award to a student who was unable to gain admission to a graduate school as a fully qualified student will be cancelled.

Tenure. The Entomological Society of Canada Postgraduate Awards are granted for tenure in Canada. A successful candidate may carry out his or her postgraduate research at the Canadian university of his or her choice. Tenure may commence on or after 15 December 1983 but not later than the date on which the academic year begins.

Method of Application. The Entomological Society of Canada Postgraduate Award will be announced before 1 October 1982. Candidates should submit a properly completed form, with supporting documents in accordance with the instructions printed on the application form. Applications must be received by the Secretary of the Society not later than 15 June 1983.

REGULATIONS

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

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

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

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

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

Payment of the Award. The Awards will be paid in January 1984 on receipt of a report of satisfactory progress from the supervisors.

Additional Allowances. The Award stipends are all-inclusive. There is no provision for additional grants by the Society for any purpose. Additional grants, for example, to attend meetings, pay course fees, meet publication costs, etc., will not under any circumstances, be authorized.

BOURSES POUR ÉTUDIANTS POST-GRADUÉS 1983

Avis

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

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

Toute correspondance relative aux bourses doit être adressée à:

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

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

Éligibilité. Les candidats choisis doivent être citoyens canadiens ou résidents reconnus du Canada avec un baccalauréat d'une université canadienne. Il est aussi obligatoire que les candidats doivent être inscrits en première année d'études post-graduées durant l'année courante 1983. Les bourses ne seront accordées qu'ilorsque les candidats auront soumis un dossier démontrant qu'ils sont enregistrés aux études supérieures pour l'année courante 1983 et que leurs programmes établis en vue d'un diplôme supérieur donne tous les privilèges rattachés au statut d'étudiant post-gradué. A défaut de ce dossier, la bourse sera annulée. Avant de recevoir leur bourses, le Doyen de l'École des Études Supérieures aura soumis par écrit un témoignage d'authenticité du programme d'études et de status de les étudiants. Un étudiant qui s'inscrit en vue de compléter l'obtention de crédits ne peut pas faire une demande pour la bourse de la SEC. Si la bourse était accordée à un candidat qui n'aura pu obtenir son admission à une École de Gradués, celle-ci sera annulée.

Endroit. Les bourses ne peuvent être obtenues qu'au Canada. Les candidats pourraient s'inscrire à l'université de leur choix. Les bourses prendront effet le 15 décembre 1983 ou plus tard sans excéder la date du début de l'année académique.

Formalités de la demande. Les bourses seront annoncées avant le 1er octobre 1983. Les candidats devront soumettre leur candidature à l'aide du formulaire approprié et y ajouter tous les documents requis sur la formule de demande. Les demandes devront être reçues par le Secrétaire de la Société au plus tard le 15 juin 1983.

RÈGLEMENTS

Démonstration et cours. Un boursier pourra dans de circonstances normales donner des séances de cours ou de démonstration jusqu'à un maximum de 200 heures par année pourvu que le chef de son département en exprime le désir et considère que ces tâches additionnelles n'iront pas à l'encontre du progrès de l'étudiant. Un boursier peut accepter une rémunération au taux normal à l'université où il se trouve.

Autres sources de revenus. Sauf pour fins de démonstration et les jours de congé, un boursier devra consacrer tout son temps à l'étude et à ses recherches et n'accepter aucune autre rémunération, mais pourra jouir d'une autre bourse ou d'un prix.

Transferts. Après acceptation d'une bourse, tout changement dans le programme d'études ou déplacement vers une autre université devra recevoir au préalable l'approbation du Comité de la Bourse de la SEC. Une telle demande doit être accompagnée de documents provenant des deux Chefs de départements concernés.

Une bourse est accordée pour poursuivre des études du 2e ou 3e cycle conduisant à l'obtention d'un degré en entomologie. Les boursiers qui décideront de changer d'orientation pour d'autres disciplines que l'entomologie deviendront inéligibles et se verront retirer leur bourse.

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

Paiement de la bourse. Le paiement d'une bourse se fera au cours de janvier 1984 sur réception d'un rapport satisfaisant du professeur du boursier.

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

FELLOWS OF THE ENTOMOLOGICAL SOCIETY OF CANADA

Adams, Jean B., Fredericton, New Brunswick 1976
Angus, T.A., Sault Ste. Marie, Ontario 1977
Atwood, C.E., Toronto, Ontario 1976
Auclair, J.L., Montreal, Quebec 1976
Balch, R.E., Fredericton, New Brunswick 1977
Ball, G.E., Edmonton, Alberta 1976
Becker, E.C., Ottawa, Ontario 1976
Beirne, B.P., Vancouver, British Columbia 1976
Bird, F.T., Sault Ste. Marie, Ontario 1976
Blais, J.R., Ste-Foy, Quebec 1976
Borden, J.H., Burnaby, British Columbia 1981
Brust, R.A., Winnipeg, Manitoba 1976
Bucher, G.E., Winnipeg, Manitoba 1979 (Deceased, 1982)
Burrage, R.H., Saskatoon, Saskatchewan 1976
Cartier, J.J., Ottawa, Ontario 1978
Chant, D.A., Toronto, Ontario 1976
Cooper, G.S., Toronto, Ontario 1977
Corbet, P.S., Christchurch, New Zealand 1977
Danks, H.V., Ottawa, Ontario 1982
Davey, K.G., Toronto, Ontario 1977
Davies, D.M., Hamilton, Ontario 1981
Dethier, V.G., Princeton, New Jersey 1976
Downes, J.A., Ottawa, Ontario 1976
Duporte, E.M., Ste-Anne de Bellevue, Quebec 1977 (Deceased, 1981)
Eidt, D.C., Fredericton, New Brunswick 1980
Forbes, A.R., Vancouver, British Columbia 1982
Friend, W.G., Toronto, Ontario 1979
Glen, R., Victoria, British Columbia 1977
Hagen, K.S., Albany, California 1980
Harris, C.R., London, Ontario 1977
Holland, G.P., Ottawa, Ontario 1977
House, H.L., Trenton, Ontario 1978
Kelleher, J.S., Ottawa, Ontario 1980
Kevan, D.K., McE., Ste-Anne de Bellevue, Quebec 1977

LeRoux, E.J., Ottawa, Ontario 1977
 Loschiavo, S.R., Winnipeg, Manitoba 1981
 MacCarthy, H.R., Vancouver, British Columbia 1979
 MacGillivray, E., Fredericton, New Brunswick 1978
 Mackauer, M., Burnaby, British Columbia 1978
 MacPhee, A.W., Kentville, Nova Scotia 1979
 Madsen, H.F., Summerland, British Columbia 1976
 Martineau, R., Ste-Foy, Quebec 1978
 McEwen, F.L., Guelph, Ontario 1976
 McGinnis, A.J., Vineland Station, Ontario 1979
 McIver, S.B., Toronto, Ontario 1981
 McLintock, J.J.R., Saskatoon, Saskatchewan 1977 (Deceased, 1982)
 McNeill, J.N., Quebec, Quebec 1981
 Miller, C.A., Fredericton, New Brunswick 1976
 Morris, R.F., Fredericton, New Brunswick 1977
 Morris, P.F., St. John's, Newfoundland 1981
 Munroe, E.G., Ottawa, Ontario 1977
 Nesbitt, H.H.J., Ottawa, Ontario 1976
 Paradis, R.O., St. Jean, Quebec 1976
 Peterson, D.G., Ottawa, Ontario 1976
 Philogène, B.J.R., Ottawa, Ontario 1980
 Pickett, A.D., Deep Brook, Nova Scotia 1977
 Pielou, D.P., Halifax, Nova Scotia 1979
 Pimentel, D., Ithaca, New York 1977
 Prebble, M.L., Manotick, Ontario 1977
 Prentice, R.M., Ottawa, Ontario 1980
 Proverbs, M.D., Summerland, British Columbia 1976
 Riegert, P.W., Regina, Saskatchewan 1980
 Robinson, A.G., Winnipeg, Manitoba 1980
 Sabrosky, C.W., Washington, District of Columbia 1976
 Scudder, G.G.E., Vancouver, British Columbia
 Shemanchuk, J.A., Lethbridge, Alberta 1982
 Sippell, W.L., Sault Ste. Marie, Ontario 1980
 Smirnoff, W.A., Ste-Foy, Quebec 1976
 Smith, R.F., Berkeley, California 1976
 Stark, R.W., Portland, Oregon 1978
 Turnock, W.J., Winnipeg, Manitoba 1982
 Urquhart, F.A., West Hill, Ontario 1981
 Varley, G.C., Oxford, England 1976
 Walley, G.S., Ottawa, Ontario 1976
 Wellington, W.G., Vancouver, British Columbia 1977
 West, A.S., Kingston, Ontario 1977
 Wiggins, G.B., Toronto, Ontario 1982

COMMITTEES OF THE ENTOMOLOGICAL SOCIETY OF CANADA: Update Members for 1982-83

Elections

D.L. Gibo (Chairman)
 T.M. Alloway
 G.K. Morris

Mississauga
 Mississauga
 Mississauga

Insect Common Names and Cultures

E.M. Belton
 P. Benoit
 J.S. Kelleher
 G.B. McNeill
 A.G. Robinson
 P.D. Syme
 L.S. Thompson
 W.Y. Watson

Burnaby
 Quebec
 Ottawa
 Indian Head
 Winnipeg
 Sault Ste. Marie
 Charlottetown
 Waterloo

<i>Membership</i>	B.D. Frazer (Chairman) J.L. Auclair (S. E. Que.) J.C. Conroy (E. S. Man.) J.A. George (E. S. Ont.) H.F. Madsen (E. S. B.C.) O. Olfert (E. S. Sask.) H.B. Specht (Acad. Ent. Soc.) J. Weintraub (E. S. Alta.)	Vancouver Montreal Winnipeg London Summerland Saskatoon Kentville Lethbridge
<i>Public Education</i>	A.D. Tomlin (Chairman) B.D. Frazer (E. S. B.C.) T.D. Galloway (E. S. Man.) R. Harmsen (E. S. Ont.) P.P. Harper (S. E. Que.) P.W. Riegert (E. S. Sask.) J.S. Shemanchuk (E. S. Alta.) J.D. Shorthouse R.W. Storch (Acad. E. S.)	London Vancouver Winnipeg Kingston Montreal Regina Lethbridge Sudbury Orono
<i>Scholarships</i>	R.D. McMullen (Chairman) J.P. Bourassa (S. E. Que.) M.M. Chance (E. S. Man.) W.A. Charnetski (E. S. Alta.) C. Gillott (E. S. Sask.) E.F. Johnson (E. S. Ont.) L. Safranyik (E. S. B.C.) R.H. Storch (Acad. E. S.)	Summerland Trois-Rivières Winnipeg Lethbridge Saskatoon Stoney Creek Victoria Orono
<i>Canadian Committee of the International Association on Water Pollution Research</i>	E. Scherer	Winnipeg
<i>SCITEC</i>	S.B. Hill	Ste. Anne de Bellevue
<i>Committee of Parliamentarians, Scientists, and Engineers</i>	H.V. Danks	Ottawa

OFFICERS OF AFFILIATED SOCIETIES

Entomological Society of British Columbia

President:	Dr. J.A. McLean
President-Elect:	Dr. R. Ring
Secretary-Treasurer:	Dr. Imre S. Otvos Pacific Forest Research Centre 506 West Burnside Road Victoria, B.C. V8Z 1M5 Tel: 604-388-3811
Editor (Journal):	Dr. H.R. MacCarthy
Regional Director to ESC:	Dr. B.D. Frazer

Entomological Society of Alberta (to October 1983)

President:	Dr. B. Taylor
Vice-President:	Mrs. M. Steiner
Secretary-Treasurer:	Mr. Rick Butts Alberta Agriculture Box 7777 Fairview, Alberta T0M 1L0 Tel: 403-835-2291
Editor (Proceedings):	Dr. W.A. Charnetski
Regional Director to ESC:	Mr. J.A. Shemanchuk

Entomological Society of Saskatchewan (to October 1983)

President:	Dr. C. Gillott
Vice-President:	Dr. O. Olfert
Secretary-Treasurer:	Dr. D.P. Peschken
	Research Station
	Agriculture Canada
	P.O. Box 440
	Regina, Saskatchewan S4P 3A2
	Tel: 306-585-0255
Editor (Proceedings):	Dr. W. Steck
Regional Director to ESC:	Dr. P.W. Riegert

Entomological Society of Manitoba (to November 1983)

President:	Dr. G.R.B. Webster
Vice-President:	Dr. G.K. Bracken
Secretary:	Dr. N.D.G. White
	Agriculture Canada Research Station
	195 Dafoe Road
	Winnipeg, Manitoba R3T 2M9
	Tel: 204-269-2100
Treasurer:	Mr. W.L. Askew
	Agriculture Canada Research Station
	195 Dafoe Road
	Winnipeg, Manitoba R3T 2M9
	Tel: 204-269-2100
Editor (Proceedings):	Dr. P.S. Barker
Assistant Editor (Proceedings):	Dr. R.E. Roughley
Regional Director to ESC:	Dr. T.D. Galloway

Société d'entomologie du Québec (jusqu' à Octobre 1983)

Président:	Dr. J.M. Perron
Vice-Président:	Dr. P.-P. Harper
Secrétaire:	Dr. G. Bonneau
	Laboratoire d'Entomologie forestière
	Complexe Scientifique du Québec
	2700 rue Einstein (ch C-0-1)
	Sainte-Foy, Qué. G1P 3W8
Tresorier:	Dr. C. Bouchard
	Service de la Recherche en défense des
	cultures
	Complexe Scientifique du Québec
	2700 rue Einstein (ch D-1-54)
	Sainte-Foy, Qué. G1P 3W8
Editeur (Revue d'Entomologie du Québec):	Dr. A. Maire
Représentant à la SEC:	Dr. P.-P. Harper

BIOLOGICAL SURVEY OF CANADA (TERRESTRIAL ARTHROPODS)

Meeting of the Scientific Committee

The Scientific Committee for the Biological Survey met in Ottawa on October 21-22, 1982. The following account of the meeting is abbreviated as requested by the Bulletin Editor, and a fuller account appears in the Spring 1983 *Newsletter of the Biological Survey of Canada (Terrestrial Arthropods)*.

Reports

1. National Museum of Natural Sciences

Mr. C.G. Gruchy reported that arrangements were in progress to place Dr. H.V. Danks in the Museum on staff, rather than on contract as at present. This would help to provide stability to the Survey.

2. Parks Canada

Mr. B. Briscoe explained to the Committee the draft of Parks Canada's revised guidelines for research in Parks. The guidelines would allow more flexibility to researchers than hitherto.

3. Entomological Society of Canada

Dr. G.B. Wiggins stated that the Society was very pleased with the work of the Biological Survey, and the news that the Secretariat was being brought on to the staff of the Museum. He added that the Society Executive recognizes a unique and successful enterprise, which has introduced a new dimension in biological thinking in the country, whereby professional societies contribute to a science policy for Canada.

4. Association of Systematics Collections

Dr. G.G.E. Scudder noted that at the May 1982 meeting of the Association of Systematics Collections (Honolulu, Hawaii), a resolution supporting Biological Surveys and related activities had been carried. [The text of this resolution appears in the *Newsletter of the Biological Survey of Canada (Terrestrial Arthropods)* 1(2):20.]

Scientific priorities

The scientific projects of the Survey were discussed; some recent developments are indicated below.

1. Illustrated keys to the families of insects in Canada

The possibility of an additional separate section of illustrated keys, introducing the arthropods and treating the myriapods, is being investigated.

2. Insect fauna of the Yukon

Useful collections continue to be made. Activities based at the University of British Columbia, the Royal Ontario Museum, and the Biosystematics Research Institute in 1982 and 1983 were discussed. The Royal Ontario Museum party in 1982 also visited Alaska. In some groups interesting new finds continue; in others (e.g. caddisflies: Dr. Wiggins) little that is new has been discovered in recent collections, suggesting that the fauna is becoming fairly well known.

3. Arthropod fauna of Canadian grasslands

A format into which more detailed background information on "representative native grassland" sites can be assembled is being prepared for use next field season. A newsletter about the project will be mailed out during 1983.

4. Aquatic insects of freshwater wetlands

It was decided that a workshop to focus interest in wetland insects is feasible. Plans for formal proceedings in 1984 are being developed, and will soon be announced.

5. Arthropod fauna of freshwater springs

The Committee discussed a draft statement introducing the project on springs. This was brought to final form for publication in the *Bulletin*.

6. Review of insect dormancy

Support for this project had been sought through an Unsolicited Proposal to Supply and Services Canada (see *Bull. ent. Soc. Can.* 14(2): 38). However, now that Dr. Danks is a full-time employee of the National Museum of Natural Sciences, such a proposal was not feasible. The Committee therefore recommended to the Entomological Society of Canada that the proposal be withdrawn, but urged that work on the review nevertheless be continued by Dr. Danks.

7. Arthropod fauna of soil

The brief on soil arthropods (*Bull. ent. Soc. Can.* 14(1), insert) was being circulated to a variety of biologists, and would also be discussed at the E.S.C./E.S.A. annual meeting. Several soil scientists have been contacted, and some possibilities for further liaison are currently being explored.

8. Queen Charlotte Islands

In 1984 a multidisciplinary 3-day symposium about the Queen Charlotte Islands (organized by Drs. Taylor, Lindsay and Scudder) is being arranged at the University of British Columbia (August 22-24, 1984; registration on 21st). This symposium will synthesize available information, through invited papers, and will be followed by a 10-day field trip to the

islands by chartered boat (Aug. 24 (evening)-Sept. 3, 1984). Several parties will visit the Queen Charlotte Islands in 1983. The Biological Survey hopes in due course to sponsor a publication on the arthropods of the islands; knowledge is too scattered at present to do this.

General Activities of the Secretariat

The second issue of the *Newsletter of the Biological Survey of Canada (Terrestrial Arthropods)* was distributed during September 1982.

A series of visits to western Canada was completed in October, during which various seminars and informal talks took place; eastern centres would be visited during November.

Some discussions had also been held with biologists interested in developing biological surveys for groups other than insects.

Survey participation in E.S.C./E.S.A. Annual Meeting

Plans for activities at the joint annual meeting were discussed. The Biological Survey sponsored Symposium "Origins of the North American insect fauna" treated a diversity of subjects; approval in principle had been received to publish the proceedings in a single issue of the *Canadian Entomologist*. A display for the meeting introduced the Biological Survey of Canada and its scientific projects. Dr. Danks was invited as keynote speaker to a Formal Conference on "Utilization and development of the insect and mite systematics resources in North America".

Amateur liaison

The Committee appointed a subcommittee (J.M. Campbell, Chairman), to consider the possibilities of liaison with amateur entomologists.

Other items

Among other items discussed by the Committee were: work on insect subfossils in the Gaspé; funding for northern research station; initiatives by the Société entomologique du Québec on private insect collections, and on literature about Quebec insects in the French language; preservation of a collection of arthropods from western streams.

H.V. Danks
National Museum of Natural Sciences
Ottawa, Ontario K1A 0M8

BIOLOGICAL SURVEY OF CANADA (TERRESTRIAL ARTHROPODS)

National Survey of Freshwater Springs

Introduction:

As part of an ongoing project on Arthropod Communities of Special Habitats in Canada, The Biological Survey of Canada, under the auspices of the National Museum of Natural Sciences and the Entomological Society of Canada, is encouraging research on freshwater springs, nationwide.

Odum (1971) stated that springs "hold a position of importance as study areas that is out of proportion to their size and number" compared with other types of environments. They are, he adds, "the aquatic ecologists' natural constant temperature laboratory because of the relative constance of the chemical composition, velocity of water and temperature".

The Goals:

Long-term plans are to complete a survey of the arthropods of cold and warm spring habitats in Canada, to further the systematics, zoogeography and ecology of these organisms. At the same time, it is hoped that to initiate a number of intensive studies of regionally characteristic springs with the aim of unravelling community dynamics, trophic bases, life cycles, dispersal mechanisms, effects of past environmental changes and other features unique to these habitats and their faunas.

Present Status of Research on Canadian Springs:

Basic information is woefully lacking on the flora, fauna and environmental characteristics of these habitats, particularly with regard to the importance of arthropods, many of which appear to be endemic to these areas. Similarly, no experimental work on spring arthropod communities exists in Canada.

Background information on Springs in Canada:

Although spring habitats provide very uniform conditions in regions which may be subject to considerable seasonal change, their precise characteristics vary considerably across the country. Accordingly, a survey of this sort should attempt to define regions where such variation will occur and where sampling should be emphasized.

As springs are the sites of emergence of groundwater flowing along an impervious rock stratum (Ruttner 1953) chemically they reflect the surrounding geology; finding and sampling of springs in key physiographic areas of the country is therefore important. Similarly, as spring water temperature generally reflects the mean annual air temperature of the region (Hynes 1970), and discharge may be related to precipitation, sampling in specific climatic regions should be considered also. Finally, as surrounding vegetation may affect the environmental features of a spring and its constituent fauna through allochthonous food input, sites in various forest regions of the country should be examined. Figure 1 superimposes three classical mappings of Canadian regional physiography, climate and vegetation types (taken from Danks 1979). From this, I have identified 22 major regions each differing in its combination of geology, climate and characteristic vegetation and each of which may reasonably be expected to exhibit spring habitats of characteristic, if not distinctly different, nature. Although yet another zonal scheme is perhaps undesirable, existing Faunal Province delimitations (e.g. that of Hagmeier 1966) do not seem appropriate—particularly as the scheme described here is being proposed for predictive and surveying purposes of a distinct, small-scale (though continent-wide in occurrence) habitat type and its fauna. These zones are:

- (1) Cordilleran coastal zone
- (2) Cordilleran subalpine zone
- (3) Cordilleran montane zone
- (4) Cordilleran columbian zone
- (5) Cordilleran boreal forest
- (6) Cordilleran tundra and grassland
- (7) Interior plains grassland
- (8) Interior plains boreal forest and grassland
- (9) Interior plains boreal forest
- (10) Interior plains boreal forest and barren land
- (11) Arctic lowlands tundra and grassland
- (12) Arctic coastal plains tundra and grassland
- (13) Innuitian tundra and grassland
- (14) Arctic shield tundra and grassland
- (15) Canadian shield boreal forest and barren land
- (16) Canadian shield boreal forest
- (17) Hudson platform boreal forest and barren land
- (18) Canadian shield Great Lakes—St. Lawrence zone
- (19) St. Lawrence lowlands—Great Lakes zone
- (20) Appalachian—Acadian zone
- (21) Appalachian boreal forest
- (22) Appalachian boreal forest and barren land

With any of these zones, springs may vary depending on their emergence characteristics. Thus, limnologically, we might expect to find one or more of the following types (Bornhauser 1913):

Rheocrenes are springs which result when water passes along a horizontal channel and emerges suddenly forming a small waterfall, or at least a rapid stream of steep gradient, which does not permit the settling of fine particles, leaving a clear, stony or sandy basin.

Limnocrenes occur where water wells up vertically into a basin lined with mud and fine debris, which usually becomes overgrown with aquatic plants.

Helocrenes occur where water issues gently up through a thick layer of soft earth and forms a marsh or pool.

Rheocrenes, therefore, would typically be most common in mountainous areas, while *helocrenes* would be more characteristic in areas of little relief.

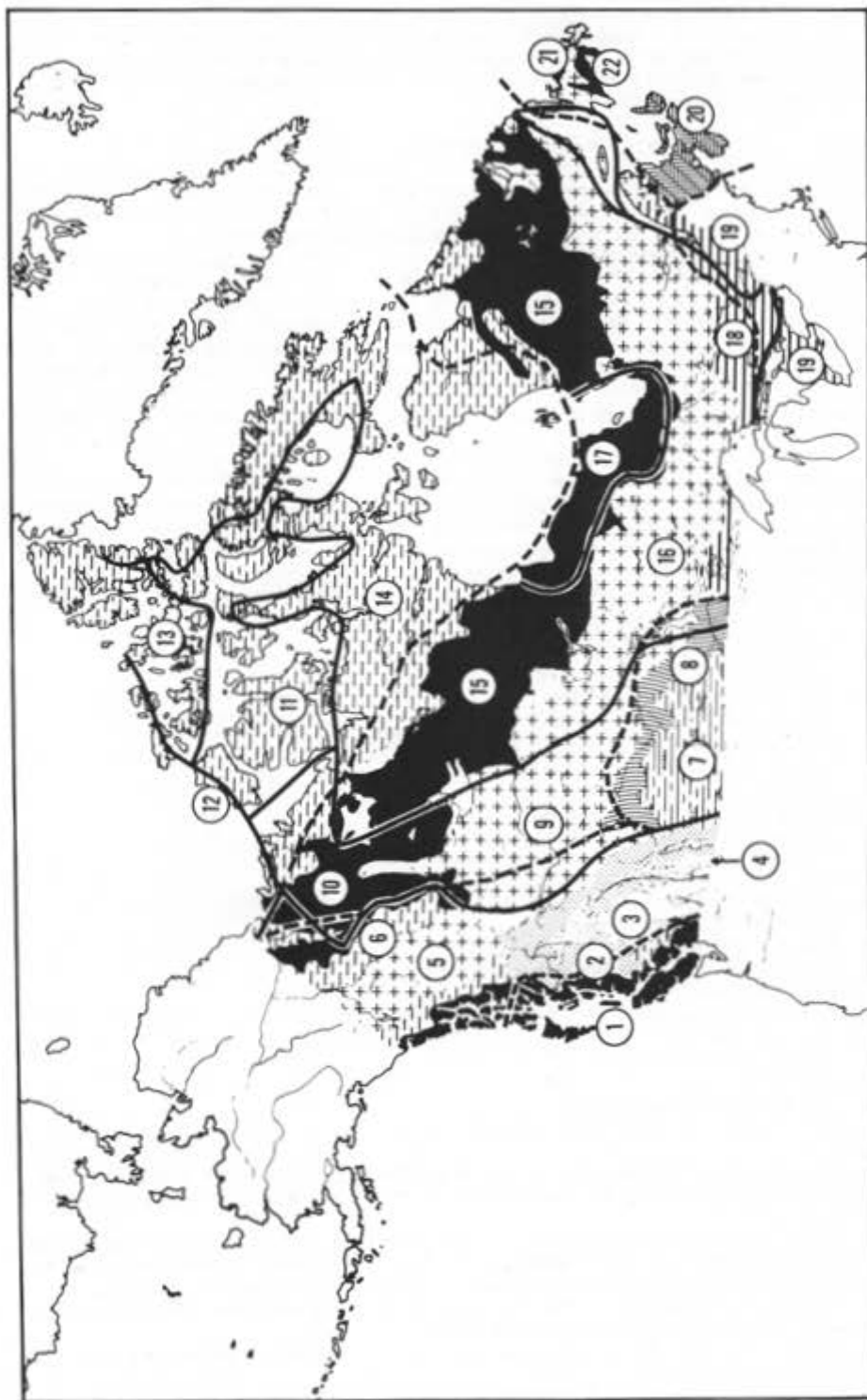


Figure 1. Predictive zonation map of spring habitats in Canada. (Solid lines indicate physiographic boundaries, broken lines indicate climatic boundaries. Both are superimposed on a vegetation map)

Size of springs, again, will vary between and within zones, with some of the largest in areas of limestone bedrock (Fetter 1980). Hot springs are usually associated with volcanic activity and, in Canada, are to be found, for example, in the Sulphur Mountain region near Banff, Alberta, in the Radium and Fairmont areas of B.C. and in various parts of the Yukon and N.W.T. (Crandall and Sadler-Brown 1976).

One point perhaps worth stressing is that not all springs exhibit the very constant conditions of temperature and discharge for which springs are generally noted. In areas of sporadic groundwater recharge, for example, source aquifers may become exhausted at certain times of the year leading to reduction or even stoppage of flow, which may allow changes in water temperature. These spring types should be included in the survey, however, as biogeographically they may represent important transitional habitats for the spread of certain taxa from true springs to the environmentally more variable streams and rivers.

Arthropod fauna of springs:

Apart from some sulphur bacteria and Cyanophyta no organisms live in the boil zone of rheocrenes (Odum and Caldwell 1955). In the other two spring types, however, arthropods may occur right up to the point of emergence from the ground. Spring faunas are mostly stenothermal and, characteristically, are dominated by one or two species (Pennak 1953). Some pond species may be present in limnocrenes but the relatively constant low temperature limits their diversity.

The fauna in and around the boil often includes groundwater crustaceans which persist in sheltered places for a short distance downstream (Hynes 1970). Also present are animals normally found in soil water, such as certain oribatid mites, hydrophilid beetles, and tipulid dipterans (Thienemann 1912). A third element in the fauna consists of truly surface-water species such as stenothermal Coleoptera (e.g. some *Hydroporus*), Plecoptera (e.g. some *Leuctra*), and Trichoptera. Occasionally, stream dwelling insect species that live farther downstream may migrate up into the spring (Minckley 1963).

The chemical nature of the emerging groundwater can have a profound effect on the fauna. For example, in limestone areas calcium carbonate may be deposited around the boil. This often becomes covered with algae and attracts certain insect species such as the midge larva *Lithotanytarsus*, which makes calcareous tubes, and the psychodid *Pericoma* (Geijskes 1935).

Most records of insects from hot springs are from those with temperatures between 35° and 50° C. These insects include Chironomidae, Culicidae, Stratiomyidae, and Ephydriidae amongst the Diptera, Dytiscidae and Hydrophilidae (Coleoptera), Hemiptera, and Odonata (Pennak 1953; Wickstrom and Wiegert 1980).

Study of arthropods of Canadian springs towards the goals suggested in this statement will have many benefits. To give some specific examples: basic documentation of identities and distributions of species may, as in other parts of the world, reveal new species, genera and even high taxonomic groupings of a variety of arthropods (e.g. ostracods in Australia, De Deckker 1979). This may also unearth glacial relict species as was the case for the blind aquatic isopod *Salmasetellus steganothrix* in Alberta (Clifford and Bergstrom 1976). Correlations between occurrences of species and various physio-chemical characteristics of springs will provide information on factors controlling distributions and community composition. Related to this will be a better understanding of dispersal mechanisms used by arthropods endemic to springs which may indicate, in a paleoecological sense, the effects of past environmental changes on spring habitats in various regions of Canada. Field and laboratory studies of the physiology of spring species may reveal unique adaptations to these habitats, perhaps relating to endemism or dispersion—hibernation studies of hydrophilid beetles in Sweden, for example, have shown that springs provide very suitable overwintering sites in areas of extreme climate (Lundberg and Muller 1977). Finally, the simplified arthropod communities found in some spring types provide an ideal tool for functional analyses of aquatic ecosystems that may be impossible in more complex situations (e.g. Collins *et al.* 1976).

Means of Achieving the Goals: WHAT YOU CAN DO TO HELP

Three levels of involvement are suggested:

- (A) *Substantial Involvement:* At this level, interested people might be prepared to initiate comprehensive research projects on springs either themselves or through graduate student direction; careful direction of undergraduate honours student projects could also yield substantial useful information.
- (B) *Partial Involvement:* At this level, a person might wish to become involved with the programme in a small way. For example, he/she would be prepared to take one or two spot samples of fauna (plus minimal, easily-measured physical/chemical parameters of

the water) from local springs. In addition, people who plan field trips, in the next year or two, to remote parts of the country are particularly encouraged to contribute. Samples from the key geographical areas (indicated on Figure 1) or from major spring types could be obtained by these means. Taxonomists might indicate groups of arthropods from springs that they would be prepared to identify.

- (C) *Some Involvement:* Here, it is envisaged that a person could contribute at least reprints, unpublished data or specimens which they might have in their possession and which might be relevant to any aspects (e.g. from purely taxonomic studies to physical/chemical measurements) of springs in Canada. Names and addresses of others known to have an interest in springs might be supplied.

People interested in becoming involved with this project are asked to contact the undersigned, stating the nature and level of their proposed involvement. A summary of this information will be made available to those on a mailing list. Subsequent progress reports will be issued at intervals.

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APPROACHES TO CANADA'S NEEDS FOR ENTOMOLOGISTS

Entomologists in Agriculture Canada, the Role and the Need

by
A.A. Gultard*

Much of the information on which I have based my comments was obtained during early 1982 when I was developing scientist recruiting strategies for the Research Branch of Agriculture Canada. It is supplemented by information obtained from the Manpower Committee of the Agricultural Institute of Canada and by recent discussions with senior staff of the Research Branch. These discussions confirmed that, despite present financial restrictions, the commitment to existing programs continues and that earlier estimates of future need for scientists are still valid.

I will simplify my discussion of the need of Agriculture Canada for entomologists by assuming that all are employed by its Research Branch. This is not completely true since a few are employed by its Food Production and Inspection Branch. There is another assumption that is useful for those who wish to use the need for entomologist by Agriculture Canada to estimate the Canadian need. The assumption is that one-half of the working entomologists in Canada are employed by Agriculture Canada and that future need will be in this proportion.

Agriculture Canada has employed entomologists since its Experimental Farm Service was started in 1886. Employment of entomologists was intensified when part of the mandate for scientific investigation held by the Experimental Farm Service was transferred to a newly formed Science Service. This emphasis on entomology and pathology as the two disciplines essential to the development of strategies for crop and animal protection was maintained when the two Services were united to form the Research Branch. The emphasis is still apparent.

A recent count indicates that 300 of the 900 scientists employed by the Research Branch are involved with research in crop and animal protection. Slightly more than one-half of these are entomologists. They mostly work in groups at a few Research Stations and Institutes. There are some 35 at the Biosystematics Research Institute, from 20 to 30 at the Research Center at London and at each of the Research Stations at Lethbridge, Saskatoon, Vineland and Winnipeg and smaller groups at the Research Stations at Harrow, Kentville, Ottawa, Regina and Vancouver. The others work individually at Research Stations as members of crop and animal production groups.

The Research Branch has made the best possible estimate of the number of entomologists that will be required during the next five years to maintain the present level of research in crop and animal protection. The estimate is based on program priorities and on known and anticipated separations. The visible need is for 20 entomologists during the next five years recruited at a rate of from two to six per year.

The present research requires entomologists with specialization in taxonomy, pathology, toxicology, chemistry, population dynamics and related specialties. There will be some change in emphasis but generally it can be assumed that replacement needs will be mostly in areas of present activity. There will be changes but I believe that they will be slow and predictable.

It is my personal opinion that 20 years from now many of the entomologists employed by Agriculture Canada, provinces, universities and industry will be involved with research and development activities that now receive only minor consideration. Economic necessity will dictate a shift in emphasis to very strong support of intensified crop production. In this support particular emphasis will be on the biological control component of integrated management systems for maintaining populations of insects, diseases and weeds at levels of intensity that are both environmentally and economically acceptable. In this activity entomologists will work as part of wide-based, multidisciplinary teams. To be most effective they will require education and experience that provides them with broad general training in entomology and a highly developed specialty.

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Enrolments in Graduate Programs in Agriculture in Canada

by
B.D. Kay*

The supply of graduate students with Ph.D degrees in agriculture, based on current levels of enrolment in Canada, is conservatively estimated to meet only from 46 to 84% of the demand for personnel between 1980 and 1986. Attrition due to retirements accounts for a significant component of this demand. The retirements are not uniformly distributed across fields of study or areas of emphasis within fields of study. Additional information is required before projections can be made beyond 1986.

The inadequate supply of graduates suggests a need to increase enrolments in Ph.D. programs in agriculture. However, in order to attract greater numbers of students into Ph.D. programs, it is essential to understand the basis on which a student makes the decision whether or not to pursue graduate work. In order to provide this information, a survey of the attitudes and perceptions towards graduate work which are held by students, was conducted. Graduates from Bachelors programs who met the minimum academic requirements for admission to graduate programs and students enrolled in Masters programs were included in the survey.

An analysis of the attitudes and perceptions that students had of graduate work and agricultural research, reveals that many students are not well-informed about graduate work. Students who were not planning on further graduate work were more pessimistic about the "value" of graduate work than those who were continuing. A higher proportion of the students who were not going on thought that agricultural research conducted within graduate programs is neither exciting nor challenging; that research conducted in graduate programs will not be important in helping find solutions to problems facing society; and that job satisfaction would not be enhanced with an additional graduate degree.

Responses from both Bachelor graduates and Masters students showed that the people who were most influential when a decision was made regarding graduate work included: family, professors, other students, personal friends (not included in previous categories) and employers. From 38 to 52% of the respondents rated one of parents or relatives, students, or personal friends as the most influential. About 20% of the respondents who were planning on continuing graduate work (both Bachelor and Masters) listed professors as the most influential. It is significant that university professors did not appear to be the major source of information, guidance, etc., for a large number of students at either the Bachelor or Masters degree level when graduate work was being considered.

Reasons which respondents listed as being the most important for not continuing graduate work included the desire for a break from academic pursuits, and a range of economic factors. Such economic factors included the level of financial support during graduate study; loss of income during graduate study; a belief that an additional degree would not adequately enhance income potential; a belief that an additional graduate degree would not enhance employment opportunities; a good job offer; and a desire to pay off accumulated loans. About 1/3 of both the Bachelors graduates and Masters students who were not planning on continuing graduate work listed one of these economic factors as the most important reason for not continuing graduate work. An assessment of stipend levels, the differential in starting salaries between personnel holding B.Sc. (Agr.) degrees and Ph.D. degrees and the absolute salary levels for personnel in agriculture as compared to other disciplines, confirm the significance of economic reasons for not continuing graduate work.

Students who are continuing graduate studies in spite of the lack of economic incentives make up only a small proportion of the best qualified students. It is estimated that 1/6 of the students who obtain B+, A- or A+ in the final two years of their undergraduate program will enrol in Ph.D. programs. These students cited a number of reasons for pursuing graduate work. A belief that further studies would lead to the sort of job which would give greater personal satisfaction was cited most frequently. Other factors which were cited slightly less frequently included: a desire to gain a greater depth of understanding in a specific field; a personal commitment to help find solutions to problems facing society (in developed and/or developing parts of the world) and the necessity of a graduate degree for the type of employment being sought.

An analysis of data on the level of financial support provided to graduate students in some of the Faculties of Agriculture showed that in 1978 and in 1979, the average level of support was about 15% lower than the maximum which could be paid from operating grants obtained from the Natural Sciences and Engineering Research Council (NSERC). About 45%

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of the average annual academic income received by graduate students in these faculties of agriculture originated from scholarship sources. About 33% originated from research assistantships. The remainder (22%) originated from teaching assistantships and other forms of financial support.

The significant imbalance which exists between current enrolments and projected demand indicates that there is an urgent need to develop programs to increase enrolments in Ph.D. programs in agriculture. Once such programs are developed, there will be an on-going need to monitor estimates of personnel requirements. A series of recommendations which constitute the basis of a program to increase enrolments are presented. Improved public relations; better informed prospective graduate students; a more extensive development of work-study programs; and improved economic incentives for pursuing graduate studies are the objectives of such a program. In addition, it is recommended that the Association of Faculties of Agriculture in Canada and the Agricultural Institute of Canada become more actively involved in developing and monitoring projected personnel requirements.

Applying for Entomologist Positions with the Federal Public Service

by
G. Maffett*

The Canadian Federal Public Service employs entomologists in a variety of programs in a number of departments at locations across the country. The recruitment of candidates and the filling of entomologist positions is a continuous process.

Almost all entomologists are employed in two types of positions: biologists and research scientists. The minimum educational requirement for research scientist positions is a doctorate; the minimum educational requirement for biologist positions is a bachelor's degree. Many positions also require specific work experience in a particular specialty.

Applicant Inventories

While certain difficult to fill vacancies may be advertised in scientific journals or newspapers, the majority of positions are staffed through applicant inventories. It is imperative, therefore, that those interested in joining the Federal Public Service register with the appropriate applicant inventory.

For biologist positions, applicant inventories are maintained in each of the Regional Offices of the Public Service Commission. Prospective biologists should register with the Public Service Commission in the region or regions where they wish to work. The address of these offices are listed at the end of this article.

For Research Scientist positions, a general applicant inventory is maintained by the National Capital Region Staffing Office of the Public Service Commission. An applicant inventory specifically for prospective research scientists with agriculture-related specialties is maintained by Agriculture Canada and is used to fill positions in this Department.

Because entomologists are employed as research scientists by such departments as Environment Canada and Fisheries and Oceans as well as Agriculture Canada, it is advisable for candidates to register with both the Public Service Commission and Agriculture Canada.

The Application Process

Candidates interested in registering in applicant inventories should submit either a completed Public Service Canada Application for Employment form (available at post offices) or a detailed curriculum vitae to the appropriate office. Any geographic restrictions or preferences should be indicated.

When an application is received by the Public Service Commission or Agriculture Canada, the qualifications of the applicant are assessed against minimum educational requirements. If the requirements are met the application is placed in the appropriate inventory. An application may remain on the inventory for up to one year, after which, unless the office maintaining the inventory is notified of continued interest, it is removed.

As vacancies occur, applications are reviewed in relation to the specific requirements of each position to be filled. Applicants meeting the basic requirements—education, experience, and language—are canvassed as to interest in the position. Those interested are referred to departmental managers for further assessment according to merit, usually

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through an interview process. All referred candidates are notified of results of competitions. It should be noted that departments may confine their final selection of qualified candidates to Canadian citizens.

When completing application forms and when writing a curriculum vitae it is advisable to include full details regarding experience and education. Only those candidates whose applications demonstrate that they meet the specific experience and education requirements of a position are referred for full assessment.

Where to Apply

For research scientist positions, send application to:

Research Scientist Inventory
National Capital Region Staffing Office
Public Service Commission
16th Floor, West Tower
L'Esplanade Laurier
300 Laurier Avenue West
Ottawa, Ontario
K1A 0M7

Research Scientist Inventory
Staffing & Development Division
Agriculture Canada
Room 1072B
Sir John Carling Building
930 Carling Avenue
Ottawa, Ontario
K1A 0C5

For biologist positions, send applications to the Staffing Office of the Public Service Commission in the regions where you wish to work at these addresses:

2nd Floor
Government of Canada Building West
354 Water Street
St. John's, Newfoundland
A1C 1C4

Suite 1100
180 Dundas Street West
Toronto, Ontario
M5G 2A8

Confederation Court Mall
134 Kent Street, 3rd floor
Charlottetown, Prince Edward Island
C1A 8R8

Credit Foncier Building
Room 500
286 Smith Street
Winnipeg, Manitoba
R3C 0K6

4th Floor, Royal Bank Building
5161 George Street
Halifax, Nova Scotia
B3J 1M8

Canadian Imperial Bank of Commerce Bldg.
Room 1010
1867 Hamilton Street
Regina, Saskatchewan
S4P 2C2

Central and Eastern Trust Building
Suite 603, 860 Main Street
Moncton, New Brunswick
E1C 8M1

2nd Floor
Capital Place
9707-110th Street
Edmonton, Alberta
T5K 2L9

Place Sillery, Room 205
1126 chemin St-Louis
Sillery, Quebec
G1S 1E5

9th Floor, Precambrian Bldg.
4922-52nd Street
P.O. Box 2730
Yellowknife, Northwest Territories
X1A 2R1

685 Cathcart Street
Room 300
Montreal, Quebec
H3B 2R1

8th Floor
700 West Georgia Street
P.O. Box 10282
Vancouver, British Columbia
V7Y 1E8

16th Floor, West Tower
L'Esplanade Laurier
300 Laurier Avenue West
Ottawa, Ontario
K1A 0M7

Suite 302, Yukon Centre
4114-4th Avenue
Whitehorse, Yukon
Y1A 4N7

RETIREMENT

Douglas Miller

Doug Miller retired January 24, 1983 from Environment Canada after serving 35 years with the Federal Civil Service. Doug received his B.S.A. degree from the University of Guelph (O.A.C.) in 1948 at which time he began his civil service career as an employee at the Biological Control Substation of Agriculture Canada which was located on the campus of the University of British Columbia, Vancouver, British Columbia. He initiated graduate studies at U.B.C. and completed his M.S.A. degree in 1951. He immediately transferred to the Biosystematics Research Institute, Ottawa, where he spent 16 years, working on the taxonomy of ants, wasps and parasitic insects. His last two years at BRI he managed to complete a Ph.D. degree at McGill University (MacDonald College), graduating from there in 1967. He was promoted to the position of Section Head Entomology at the Agriculture Canada Research Station, Harrow, Ontario in 1968 and spent the next five years conducting and managing pest management research at that station. He was promoted again in 1973 to Research Coordinator (Biosystematics) and returned to Ottawa where he coordinated research in Biosystematics, Apiculture and Vertebrate Pests for Canada. Doug remained in Ottawa until 1978 when he applied for and won his present position as Research Program Manager (Protection) at the Pacific Forest Research Centre, Canadian Forestry Service, Environment Canada, Victoria, B.C.



Doug contributed significantly to the scientific community through his published works on the classification of several insect groups especially ants, wasps and parasitic insects. He inspired many of his scientific associates both as a researcher and a research manager. He is particularly interested in the development of participatory management systems in research establishments and devoted his time in management to practising this philosophy.

Doug and his wife Ruth plan to spend their retirement years in Victoria fishing for salmon and exploring the Gulf Islands and Puget Sound areas of the Pacific West Coast in their new boat.

We wish Doug and Ruth Miller a long and happy retirement.

L. Safranyik
Environment Canada
Pacific Forest Research Centre
Victoria, British Columbia

PERSONALIA

Robert P. Bodnaryk of the Agriculture Canada Research Station in Winnipeg returned recently from Japan, where he spent eight months at Tottori University. While there, he studied the physical and chemical properties of a calcium binding protein from insect fat body.

Arthur Guitard, special assistant to the assistant deputy minister in charge of research at Agriculture Canada, assumed the presidency of the Agricultural Institute of Canada at its annual conference held at the University of British Columbia. He replaces outgoing president Clay Gilson.

Mark Winston of the Department of Biological Sciences, Simon Fraser University, has undertaken to teach a non-credit television course on "An Introduction to Bees and Beekeeping". Mark believes that changing values in nutrition and lifestyle have made beekeeping a rapidly developing hobby across Canada as well as a \$50 million business annually. British Columbia alone has over 5,000 apiarists, and such a course should prove popular.

Certain members of ESC, who are also members of the Entomological Society of America, have been appointed to Standing Committees, and as Chairmen of Sections, of the ESA. B. Pass and E. C. Becker are on the Special Committee of the Governing Board on Awards, while M. J. Tauber is on the Special Committee on Public Responsibilities. D. L. Dahlsen is now Chairman of Section C, and S. B. McIver is Chairman of Section D.

NEWS OF ORGANIZATIONS

The International Commission on Zoological Nomenclature

Twenty-six eminent zoologists and palaeontologists from seventeen countries form the Commission. The Secretary is responsible for the technical and administrative operations under the supervision of a Council of six, elected by the Commissioners from their own number. The Commission reports to the Division of Zoology of the International Union of Biological Sciences at its triennial General Assemblies.

Since the foundation of the Commission in 1895, scientific activity and publication have grown exponentially; so too has the complexity of systematic theory and taxonomic practice. In the Animal Kingdom, about 300,000 genera and 1,100,000 species of animals have been described. At least 2,000 new genera and 15,000 new species are named every year. With numbers so large, confusion and duplication are inevitable: some species have been given as many as ten or even twenty different names; some names have been used many times for different genera; in many cases, current deeply rooted practice is founded on an original mistake in identification or in the use of a name. The problem of regulating nomenclature in zoology is thus inevitably greater than in other biological disciplines: there are more species of beetles (order Coleoptera) alone—about 300,000—than of flowering plants.

It was largely to deal with these causes of confusion that the Commission was set up. Its first task was to draft an international code of rules, and this was published in French in 1905. That Code was superseded by the first edition of the present Code in 1961 and a third edition is expected in 1982. The Code lays down rules and gives guidance on what should be done when a new species is named. The Commission seeks continually to modernise the Code in harmony with developments in zoological theory and technique. The third edition, which takes account of comments from many zoologists around the world, will mark a major step forward in this direction.

When a species is seen to be new, the zoologist first searches the literature to make sure that his discovery has not already been made. Once satisfied that he has something new before him, he describes it and names it, paying heed to the provisions of the Code. If he finds confusions and misunderstandings in the literature—and, given the number of names involved, these are numerous—he will in most cases need help beyond the capacity and flexibility of any Code of rules to clarify them. The Commission has plenary powers to suspend the Code and to give a ruling on what names are to be used in particular cases. Any zoologist can appeal to the Commission for help with his problems in zoological nomenclature and the Commission's services are freely given. The Secretariat receives formal applications and deals with enquiries by post, telephone or personal visit. Applications, comments on them, and the Commission's rulings are published in the *Bulletin of Zoological Nomenclature*, of which 38 volumes have been issued since it was founded in 1943.

The technical work of the Commission demands a high level of professional expertise and much bibliographic research. It often involves lengthy correspondence with the authors of applications and with commentators and Commissioners.

Among the Commission's 1,198 published Opinions, a significant number give rulings on problems of medical, veterinary, agricultural and social importance. It is in such fields as these, where scientific names are used in applied work by large numbers of workers, who know little about taxonomic principles or rules of nomenclature, that the Commission's role is particularly important. The Commission alone has the authority to prevent legalistic considerations from upsetting established practice in subjects where names are used, for example, reports that may contribute to decisions of great financial and social importance.

The rulings listed below exemplify the three commonest ways in which the Commission intervenes to preserve or establish uniformity in nomenclature. These are:

- (1) To prevent the strict application of the Code from displacing a well-known name by an unknown earlier synonym;
- (2) To prevent a well-known name being switched, in conformity with some provision of the Code, from a genus or species to which it is applied to some other taxon;

- (3) To remove confusion arising from the misuse of a name (for example, when a name has been used for a species other than the one described by the original author of the name).

Two genera of insects whose larvae eat aphids, and are therefore potential agents for the biological control of these pests, are *Hemerobius* and *Chrysopa*. Unfortunately, the species to which the name *Hemerobius* was first fixed is the same as that for which *Chrysopa* was first established, although this fact had long been overlooked. Meanwhile, *Hemerobius* had been used for quite a different species and its relatives. The Commission had to intervene to ensure, first, that both generic names could continue in their accustomed uses, and, secondly, that *Hemerobius* could no longer displace *Chrysopa* on a priority basis.

The three main malarias of humans *Plasmodium falciparum*, the organism that causes malignant tertian malaria and which recurs every third day after infection, *Plasmodium vivax* and *Plasmodium malariae*, the organisms that cause benign tertian and quartan malaria respectively, were at one time in such a state of nomenclatural confusion that developments in medical science were hindered. Malignant tertian malaria was known under six generic and five specific names (which were not always correctly applied); two names of bird malarias and six technical terms that were not names at all were also used for it. The Commission alone had the authority to sort out the prevailing confusion and prescribe which name was to be used for each of the three parasites.

Among many weevils of economic importance, the grain weevil, which eats stored grain, was known as *Calandra granaria* by European workers and as *Sitophilus granarius* in North America, while another, which attacks the roots of growing cereals, was known as *Sphenophorus abbreviatus* in Europe and as *Calendra abbreviata* in North America. The disagreement over the spelling of *Calandra/Calendra* and over the species for which it should be used was so deep-rooted that neither side would yield to the other. The Commission therefore suppressed *Calandra/Calendra*. *Sitophilus* and *Sphenophorus* are now universally used for the two species in question and there is no longer any confusion.

One of the most dangerous tick species is the vector of Rocky Mountain Spotted Fever and a number of other serious diseases of humans, horses and cattle. This species was known by two names, *Demacentor venustus* and *D. andersoni*. The latter, although the more recent name, was more widely used than the former, and the Commission ruled that it must be used.

The bee that is the main pollinator of alfalfa (lucerne), the world's largest fodder crop, has been known for 150 years as *Megachile rotundata*. Reference to the original specimens shows that the name was originally proposed for a different species. In view of the large literature on this species and on the control of its parasites, predators and diseases, the Commission ruled that it must continue to be used in its accustomed way.

Many more examples could be quoted of rulings given by the Commission, and of cases at present under consideration, to show how essential it is to have some international authority capable of intervening in situations such as those described above.

ITZN 59

8 December, 1982

The following Opinions have been published by the International Commission on Zoological Nomenclature in the *Bulletin of Zoological Nomenclature*, volume 39, part 4, on 7 December, 1982:

Opinion No.

- 1227 (p. 233) *Tinea bjerckandrella* Thunbert, 1784 and *Phalaena (Noctua) cardui* Hubner, 1790 (Insecta, Lepidoptera): conserved.
1231 (P. 243) *Blatta germanica* Linnaeus, 1767 (Insecta, Dictyoptera): conserved and designated as type species of *Blattella* Caudell, 1903.
1238 (p. 262) *Mycteromyia* Philippa, 1865 (Insecta, Diptera): designation of type species.

ITZN 11/4

(A.N.(S.) 124)

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in the *Bulletin of Zoological Nomenclature*, volume 39, part 4, on 7 December, 1982, and would welcome comments and advice on them from interested zoologists. Correspondence should be addressed to the Secretary at the above address, if possible within six months of the date of publication of this notice.

Case No.

- 1591 *Holocentropus* McLachlan, 1878 (Insecta, Trichoptera, Polycentropodidae): proposed conservation.
2402 *Galeopsomyia* Girault, 1916 (Insecta, Hymenoptera): proposed conservation.
R.V. Melville (Secretary)

MEETING ANNOUNCEMENTS

Joint Meeting Entomological Society of Canada and Entomological Society of Saskatchewan, at the Sheraton Centre, Regina, on 3-5 October, 1983 (see first Notice and Call for Papers, Bulletin of the ESC, this issue).

CONTACT: P.W. Riegert, Department of Biology, University of Regina, Regina, Saskatchewan S4S 0A2. Telephone (306) 584-4224.

Joint Meeting Entomological Society of Canada and Acadian Entomological Society, at the Algonquin Hotel, St. Andrews, New Brunswick, on 30 September-4 October, 1984.

CONTACT: G. Boiteau, Agriculture Canada Research Station, P.O. Box 20280, Fredericton, New Brunswick E3B 4Z7.

Canadian Federation of Biological Societies Annual Meeting, at the University of Ottawa, on 13-27 June, 1983.

CONTACT: G.R.F. Davies, CFBS P.O. Box, Sub. 6, Saskatoon, Saskatchewan S7N 0W0. Telephone (306) 343-7384.

Canadian Pest Management Society Annual Meeting, in Truro, Nova Scotia, on 11-13 July, 1983.

CONTACT: R.J. Whitman, Nova Scotia Agriculture and Marketing Research Station, Kentville, Nova Scotia B4N 1J5.

Entomological Society of America Annual Meeting, in Detroit, Michigan, on 9-13 December, 1983.

CONTACT: W. Darryl Hansen, Entomological Society of America, 4603 Calvert Road, College Park, MD 20740, U.S.A.

Society for Invertebrate Pathology Annual Meeting at Ithaca, N.Y., on 7-11 August, 1983.

CONTACT: Donald W. Roberts, Insect Pathology Research Centre, Boyce Thompson Institute, Tower Road, Cornell University, Ithaca, NY 14853, U.S.A. Telephone (607) 257-2030.

Joint Meeting American Phytopathological Society, Society of Nematologists, Mycological Society of America, at Iowa State University, on 26-30 June, 1983.

CONTACT: APS Headquarters, 3340 Pilot Knob Road, St. Paul, MN 55121, U.S.A. Telephone (612) 454-7250.

CANUSA Program's Forest Defoliator-Host Interaction Workshop, in early April, 1983.

CONTACT: Robert L. Talerico, Northeastern Forest Experiment Station, CANUSA (E), 370 Reed Road, Broomall, PA 19008, U.S.A. Telephone (215) 461-3015.

IV International Symposium on Trichoptera, at Clemson University South Carolina, on 11-16 July, 1983.

CONTACT: J.C. Morse, Department of Entomology, Fisheries and Wildlife, Clemson University, SC 29631, U.S.A.

VIII Beltsville Symposium in Agriculture Research, Agriculture Chemicals of the Future, at Beltsville, Maryland on 16-19 May, 1983.

CONTACT: Beltsville, Symposium VIII Office, Room 233, Building 001, BARC-West, USDA, Beltsville, MD 20705. Telephone (301) 334-3029.

VII International Symposium of Odonatology, in Calgary, Alberta on 14-21 August, 1983.

CONTACT: Dr. Gordon Pritchard, Department of Biology, University of Calgary, Calgary, Alberta T2N 1N4.

III European Ecological Symposium, Plant-Animal Interactions, at University of Lund, Sweden, on 22-26 August, 1983.

CONTACT: III European Ecological Symposium, Ecology Building, S-223 62 Lund, Sweden.

International Conference on Insect Neurochemistry and Neurophysiology, at College Park, Maryland, on 1-3 August, 1983.

CONTACT: ICINN, Insect Reproduction Laboratory, Agricultural Research Centre, USDA, Building, 306, Beltsville, MD 20705, U.S.A.

XVII International Congress of Entomology, in Hamburg, West Germany, on 20-26 August, 1984.

CONTACT: Dr. Thomas Tischler, Zoologisches Institut der Universität, Abt. Angewandte Ökologie Küstenforschung, Biologiezentrum, Olshansenstr. 40/60, D-2300 Kiel 1, West Germany.

III International Mycological Congress, in Tokyo, on 28 August-3 September, 1983.

CONTACT: Professor K. Tubaki, Secretary-General, c/o International Congress Service Inc., Chidusen Building SF, 2-7-4 Nikombashi, Chuo-ku, Tokyo, Japan.

IV International Congress of Plant Pathology, in Melbourne, on 17-24 August, 1983.

CONTACT: Dr. G. Weste, Department of Botany, University of Melbourne, Parkville, Victoria 3052, Australia.

X International Congress of Plant Protection, in Brighton, Sussex, U.K., on 20-25 November, 1983.

CONTACT: Mrs. R.A. Bishop, Frank Bishop (Conference Planners Ltd.), 144/150 London Road, Croydon, Surrey CRO 2TD, U.K.

XI International Congress for Tropical Medicine and Malaria, in Calgary, Alberta, on 16-22 September, 1984.

CONTACT: Secretariat XI ICTMM, University of Calgary, Calgary, Alberta T2N 1N4.

PUBLICATIONS

Publications Committee and Editorial Board Meeting

A meeting of some members of the Editorial Board and Publications Committee was held in Toronto in November 1982. It was suggested that it would be desirable if references to "in litt." or "pers. comm." should be supported by copies of the relevant parts of letters or letters of permission. This is a requirement of some journals and is meant to help prevent misquotations, which can become very embarrassing. We do not yet ask for such documentation in our "Instructions to Authors" but strongly advise authors to do so.

Abbreviations are a constant problem because the use of unconventional ones is almost a fad—perhaps a by-product of the computer age. We avoid unconventional abbreviations whenever possible, but admit they are sometimes convenient.

In text, for example, DFTM for Douglas-fir tussock moth and SPW for spruce budworm are not acceptable because a shortened name (after it is clear which moth or budworm is referred to), the name of a stage, or a pronoun will do nicely.

Because nobody to our knowledge, including the Council of Biological Editors, has suggested a standard abbreviation for the oft-used expression "degree-days", we have adopted °D, where the degrees are Celsius and the x represents the base temperature. Thus 10°D₉ means ten degree-days above nine degrees Celsius.

D.C. Eidt
Scientific Editor
The Canadian Entomologist

Book Review

Crowson, R.A. *The Biology of the Coleoptera*. Academic Press, London, XII & 802 pp. U.S.\$143.60.

This is the most comprehensive book yet written on the variety of biological adaptations of the largest order of living organisms. Estimates of the number of species of Coleoptera vary, but most authors agree that more than one million different species exist (of which 250,000 have probably been named). Obviously, it is impossible for one person to summarize all the diversity of biological information known to occur throughout the order. Crowson has not attempted an exhaustive literature survey, which would clearly be impossible because of

its magnitude, but rather has selected a broad cross section of references chosen to provide examples of the kinds of adaptations found throughout the order.

Except for minor criticisms, he has done an excellent job of achieving his goal.

Crowson begins the book with an introductory chapter briefly outlining the history of the study of Coleoptera, a discussion of their economic importance, a brief discussion of the phylogenetic position of the order within the Endopterygota, and the various methods of preparation and preservation of larvae and adults for study.

Chapters 2 through 4 are devoted to relatively generalized discussions of the external anatomy of larvae, pupae, and adults including examples of the types of specializations found in various structures. These chapters will be extremely useful as an introduction to beetle morphology diversity for students and non-specialists, but will be of limited use to morphologists and taxonomists. Chapters 5 through 8 discuss the basic physiological systems of Coleoptera including the digestive, circulatory, excretory, respiratory, and various sensory systems and also includes an excellent discussion of the varieties of locomotor systems. Chapter 9 discusses the cuticle and external adaptations to the environment including color, mimetic and cryptic appearances, and light production. Chapters 10 and 11 outline the variety of behaviour displayed by larvae and adults and the differing types of life-cycles and developmental patterns found throughout the order. Cytology and genetics are discussed in chapter 12.

The special physiological and morphological adaptations that have evolved in Coleoptera that account for their remarkable diversity and ability to live in such a wide range of habitats, and to feed on such a wide variety of food sources, are discussed in chapters 13 through 18. These include beetles living in aquatic and other "special" habitats such as caves, deserts, in soils, nests, etc. and discussions of adaptations to defense mechanisms, symbiotic and parasitic relationships, and feeding strategies such as predation and phytophagy. One of these chapters (17) is devoted to the variety of special interactions between beetles, trees, and fungi. Chapter 19 discusses the geographical factors affecting beetle distribution and the types of distributional patterns found in the order. In chapter 20 we find an expansion of Crowson's previous well-known work with beetle evolution and classification. Here he discusses the evolutionary origin of the order and the evolution of the major taxa within the order based primarily on the fossil record.

Of particular interest to most taxonomists is an updated version of his 1955 family classification published in "The Natural Classification of the Families of Coleoptera".

One could be critical of a general work such as this because most chapters could easily have been expanded to full-sized books. Because of Crowson's constant attempts to give only a few examples of each phenomenon rather than a more complete survey of each type of variation, many readers will find that their favorite references or areas of special interest have either been omitted or reduced to only a few lines. However, I believe that Crowson has met the objective stated in his preface "that such specialists, once they have overcome their initial dissatisfaction, may gain from this book by coming to see their particular research interests in wider contexts, and perhaps even by picking up ideas which might suggest new and fruitful directions for their investigations".

Certainly any Coleopterist, no matter what his interests, will profit from reading the book and should then be able to examine his own research in a broader and different perspective. Many Coleopterists, trying to find answers to their particular problems, will find that instead of answering their questions, different approaches are often presented which result in even more unanswered questions.

The book is clearly written but suffers from some redundancy between chapters. This perhaps is to be expected by works of this magnitude. The overall usefulness of the work would have been improved by the use of some type of chapter subheadings.

Taxonomists wishing to read the book to find out what is known of the morphology or biology of their particular group will find the book frustrating or, perhaps, impossible to use. Crowson has not attempted to discuss the biology of specific taxa, but rather, has used examples from throughout the Coleoptera to illustrate the greatest variety of biological diversity possible. All family level taxa are coded by letter and number in the outline to the Classification of Coleoptera on pages 694-698. These codes are used throughout the text for all taxa from species to family level. I found these codes to be confusing and difficult to use, requiring the reader to refer often to the classification table, but undoubtedly their use considerably reduced the volume of the text.

The book contains 319 line drawings and 9 plates of 51 photographs. It is more sparingly illustrated than might have been expected, but the illustrations are well chosen though not in all cases well-reproduced. The book has a large number of typographical errors, but most of these are obvious and do not appreciably detract from the text. Of a more serious nature, however, are many errors in captions of illustrations. For example, the caption of Fig. 53, showing drawings of *Acrocis longimanus* (A) and *Euchirus* sp. (B), and of Fig. 60 showing a

transverse section of the abdomen with a simple type (A) of lateral sclerites and with pleural sclerites (B), are both reversed. Plate 1D, p. 134 is incorrectly referred to as Plate 1A on p. 120. The frequency of errors of this nature make it necessary for readers to check all captions carefully to insure that they refer to the proper illustration.

The book contains an extensive bibliography of 47 pages and both a taxonomic and subject index. The taxonomic index is difficult to use for those wishing to extract data for all information pertaining to a specific family as the user would have to look under all generic, tribal, subfamilial, and family level taxa mentioned in the work. The subject index, though far from complete, is well-organized and easy to use. The references are well chosen, and carefully selected from all areas of the world.

In spite of the relatively minor criticisms mentioned above, this book will become the standard reference to the biology of Coleoptera and will not be replaced, as such, for years to come. It will be invaluable to all Coleopterists wishing to expand their knowledge of the order or to gain additional knowledge about specific phenomena. By using the references, readers will be put in touch with information well beyond the scope of the book. All Coleopterists should have a copy of this book at their disposal. Unfortunately, the cost of the work will make it unavailable to many who are unwilling or unable to pay \$143.60. Hopefully, copies will at least be placed in all libraries frequented by Coleopterists.

J.M. Campbell
Biosystematics Research Institute
Ottawa

Book Notice

McPherson, John Edwin. 1982. *The Pentatomoidea (Hemiptera) of northeastern North America with emphasis on the fauna of Illinois*. Southern Illinois University Press, Carbondale and Edwardsville. XII + 240 pp. \$U.S.30.00.

This book treats adults of all taxa of the superfamily Pentatomoidea in "northeastern North America." Included families are the Scutelleridae (shieldbacked bugs), Corimelaenidae (negro bugs), and Acanthosomatidae. Altogether, a fauna of about 120 species and subspecies is reported from the region, which extends from eastern Manitoba to Labrador, south to western Missouri and Virginia.

Prof. McPherson provides keys, diagnostic characters, summaries of biology, ranges, a checklist of species, prey observations, drawings of key characters, and, for each species, Illinois collection locality maps. His data base consists of about a dozen State or University collections of pentatomoids, as well as published information in more than 800 papers or books. The index is excellent, but there is no glossary. The book evidently had the benefit of an excellent proofreading.

Canadian workers will wonder why a large part of this country is covered by the work yet no notice is taken of the substantial collection of these insects at Ottawa. The book is, however, an excellent starting point for workers dealing with the pentatomoids of any region in North America.

C. Dondale
Biosystematics Research Institute
Ottawa

New Books and Publications

Annotated Bibliography of Trialeurodes vaporariorum and Encarsia formosa (1973-1978). Prepared by the Commonwealth Institute of Entomology, 56 Queen's Gate, London SW7 5JR, U.K. \$U.S.8.10.

Anopheline Nemes: Their Derivations and Histories. J.B. Kitzmiller. Thomas Say Foundation Publication Series, Vol. VIII, 1982. 639 pp. Available from the Entomological Society of America, Box 4104, Hyattsville, MD 20781, U.S.A. \$U.S. 26.50 (\$16.50, ESA members).

Use of Biological Agents in the Management of Insect Pests of Apple in Ontario. E.A.C. Hagley. Agriculture Canada Publication, 1982. 37 pp. Available from Research Station, Agriculture Canada, Vineland Station, Ontario LOR 2E0.

POSITIONS AVAILABLE

Entomologist (2 positions). Assist senior research scientists with mode of action studies, physiological research, and laboratory, greenhouse and field investigations of insecticide efficacy. Qualifications: BS in entomology with course work in insect physiology and biochemistry. Experience with laboratory and field entomology, insect rearing and computer science preferred. Send resume and 3 references to either R.J. Little or W.K. Whitney, Insecticide Discovery, P.O. Box 400, Princeton, NJ 08540, U.S.A. Both positions are with American Cyanamid Company.

Senior Research Entomologist. Screen potential insecticides and acaricides in the field/-laboratory. Describe biological properties of new compounds; find new uses for existing products; maintain insect colonies; establish contacts. Qualifications: Ph.D. or M.S. with several years experience. Salary is competitive. Available immediately. Contact Dr. Volker Fischer, Manager, Dinuba Research Farm, BASF Agricultural Research Farm, 10181 Avenue 416, POB 758, Dinuba, CA 93618, U.S.A.

Forest Entomologist. Responsible for planning and conducting independent scientific research programs, primarily on cone and seed insects of the major softwood species of forest trees, and other insects. Assess species density and distribution of these pests, determine basic biology, design and derive sampling methods, and develop control methods. Qualifications: M.S. preferably Ph.D. in forest entomology or economic entomology with forestry background. Salary commensurate with training and experience. A completed Public Service Commission form (PSC 367) should be mailed to the Regional Director, Newfoundland Forest Research Centre, Canadian Forestry Service, POB 6028, St. John's, Newfoundland A1C 5X8. Please quote position no. DOE 220-00193.

Applied Entomologist. Full-time, 11-month tenure-track appointment at assistant professor level, beginning 1 July, 1983 or as soon thereafter as possible. Research to emphasize biology, ecology and integrated control of arthropod pests of orchard crops. Teaching involves annual undergraduate and graduate courses in agricultural entomology and pest management. Qualifications include a Ph.D. degree and evidence of outstanding potential for teaching and research in orchard pest management. Applications should include: (i) curriculum vitae, academic transcripts, and evidence of teaching skills and experience, (ii) bibliography and reprints of significant publications or manuscripts, (iii) a statement outlining research areas and approaches used, and (iv) names and addresses of at least three people who can provide recommendations. All materials should be submitted by 30 April, 1983 to: E.S. Sylvester, Chair, Department of Entomological Sciences, 201 Wellman Hall, University of California, Berkeley, CA 94720, U.S.A.