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GUEST EDITORIAL

"Medaling" in Entomology

by

R. G. H. Downer*

Few Canadians are unaware that the Olympic Games were held in Los Angeles during the summer. Media coverage was extensive and the successes of our national team were widely acclaimed. Canadians can now face the world with heads held higher because, on a particular day in Los Angeles, a Canadian was one of the best among those present at running or swimming or jumping or throwing or shooting a small-bore rifle from a prone position.

Immediately following the Olympic Games, another international event was held at which Canadians also performed with distinction and reaffirmed our position as one of the outstanding nations in a different activity. As in the Olympics, our representatives and many colleagues who were unable to attend the event, have achieved an internationally-acclaimed pinnacle of excellence through many years of dedicated effort. Canadians should regale in the multifarious accomplishments of this group, however our representatives returned unheralded from the International Congress of Entomology and the general public remains unaware of our proud record in entomological research.

The reasons for the apparent lack of public interest in science are complex and varied; however, public education and awareness must receive prominence in any such discussion. A Canadian poll indicated that about 30% of newspaper readers would be interested in reading about science and about the same percentage expressed an interest in reading about sports. However, sports is a multi-billion dollar industry with armies of press officers providing sports writers with information and statistics about players and events. As a result, public interest is generated and the sports section occupies a large portion of our newspapers. By contrast, scientists are reticent about providing information to the media and the small core of science writers are required to dig through dreary, impersonal scientific literature in order to extract minimal information for a weekly column.

Many aspects of entomological research are eminently marketable, surely more so than rifle shooting from a prone position, and it is appropriate that Canadian Entomology should lead the scientific establishment into a campaign of greater public awareness. There are many excellent writers within the ranks of ESC and they should be encouraged to report the successes of entomological research and to capture the excitement that is generated by the resolution of scientific truths and their eventual application. In 1988 the next Entomological Olympics will be held in Vancouver and planning should begin now to ensure that effective liaison is established with the various media and that extensive coverage is provided of the 1988 Congress.

One consequence of the successes enjoyed by the Canadian Olympic Team is that governments and industry are currently competing to provide funds for the support of future teams. By contrast, entomological research is underfunded and the employment prospects for the next generation of entomologists are discouraging. Now is the time to capitalise upon our past successes and, thereby, pave the way for future triumphs.

THE PRESIDENT'S REPORT

34th Annual Meeting of the Entomological Society of Canada St. Andrews, N.B., October 1984

It is my pleasure to report to you on behalf of the Governing Board on the 34th year of operation of the Entomological Society of Canada. It has been an interesting and active year for the Society; one in which we have faced a number of problems; and also a year in which, I feel, we have made substantial progress. In the limited time available, I do not propose to go

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into detail since important actions of the Board will be reported in the March Bulletin [17(1)] and accomplishments of the various committees are in the December Bulletin [16(4)].

The Letters Patent of Incorporation of the Entomological Society of Canada state that the object of the Society "shall be to study, advance, and promote entomology". In earlier years, it was a relatively simple task for the Society to meet this objective. The importance of scientific advances to the well-being of society in general was quite obvious and research received the support of both policy-makers and the general public. Scientists as individuals were able to influence science policy. In those circumstances our Society was able to meet its objective primarily by serving as a fraternity for entomologists and by providing facilities for communicating results of their research. In other words, they provided their own vehicle for what today we call "Technological Transfer". However, during the past decade important changes have occurred in the way in which a Canadian science policy has been developed. These changes are now being supervised by an ever-expanding bureaucracy and the era in which individuals could influence science policy is over. Scientists can now only make themselves heard through organizations, logically through their own scientific societies, and through umbrella organizations like the BCC and hopefully the AASC.

Under these circumstances, it is evident that we must turn for leadership more and more to our own Society. Among members of the ESC we have unique expertise in many fields of entomology. The Society must utilize this expertise in forming working groups. These must not only develop farsighted policies but in the most appropriate manner translate these policies into action. The classical success in this regard is the Biological Survey of the Arthropods of Canada, initiated in the mid-seventies. Other ESC achievements were outlined in Dr. Ball's enlightening address of last year. With such initiatives, the Society has demonstrated its determination to act in a responsible manner by obtaining and publishing useful information about entomology and entomologists. Some projects have been funded by contract with outside agencies, while other studies were financed by the Society itself. The Science Policy Committee has usually acted as a catalyst for such endeavours and should continue to be aggressive. However, I must add a word of caution here. When undertaking such activities the Society must be fully prepared, and fully determined, to see these projects successfully concluded. Also, reports of projects should be published and distributed to appropriate federal and provincial government departments and agencies. Where comments are not forthcoming from such agencies, they should be solicited.

As President of your Society during the past year and being frequently confronted with this bureaucratic changing Canadian science policy, I must reiterate Dr. Glen Wiggins' proposal of 1982 when he said, and I quote, "The real issue for Entomology in Canada is how best to compete for those funds that must be alloted to Science, and more particularly for those that are allocated for the development of renewable natural resources". This is basically the viewpoint that has been expressed by previous Governing Boards. As Dr. George Ball emphasized in his Presidential Address at Regina last year, we must continue to proceed in this competition on two levels: one, oriented toward the political arena (in the broad sense, including Public Relations); and two, oriented toward the scientific level. The first by supporting our umbrella organizations in their efforts to establish a good climate for science, and secondly by working at our science to influence government managers such as Assistant Deputy Ministers and Deputy Ministers in Departments with which we share direct common interests.

Problems Addressed by the Society

In early November, the Executive Council established a Steering Committee consisting of: Drs. G. G. E. Scudder (Chairperson); G. E. Ball; S. R. Loschiavo; K. G. Davey; I. M. Smith and J. N. McNeil, to prepare a formal invitation to the Council for International Congresses of Entomology to hold its XVIII ICE in Canada in 1988. Our formal invitation was accepted by Council at the XVII ICE, held at Hamburg, Federal Republic of Germany, 20-26 August 1984, and the XVIII Congress will be held at U.B.C., Vancouver, B.C., 3-9 July 1988.

Funding for the Society's proposed study "The Economics of Insect Control in Wheat, Canola and Corn in Canada" was refused by Supply and Services Canada, on the grounds that the proposed work was not a new project but a continuation of the previous economic insect control review (Phase I). Following this setback the Executive Council successfully negotiated financing from the Research Branch, Agriculture Canada. However, funding will not be available until April 1985 and will be over a period of three years, instead of eighteen months as suggested in the ESC proposal. Contractual agreements between the Research Branch, Agriculture Canada and ESC will, hopefully, be completed and signed in October 1984, and work on the project will start immediately thereafter. Interim financing provided by the ESC will be recovered through retroactive payments from the Research Branch, Agriculture Canada. The three year contract is valued at approximately $140,000.

The Manpower Committee, consisting of Drs. F. L. McEwen, C. R. Harris, H. J. Herbert, D. J. Madder, G. B. Kinoshita, S. M. Smith and R. S. MacDonald, completed a study entitled *A Manpower Study of Entomologists in Canada - 1983*. A condensed version of the report entitled *Human Resources in Entomology in Canada, Current Status (1983) and Future Projections* was published as an insert in the ESC June Bulletin, 1984.

The year 1985 will be unique in ESC history as the Society will be deeply involved in the organization of two major Entomological Meetings. Firstly, the Annual ESC Meeting will be held at the Skyline Hotel, Ottawa, 23-25 September 1985. The theme for the meeting is "Entomology on the Northern Horizon." Dr. Don Bright is the General Chairperson. The Program Committee Chairperson is Dr. A. Hudson and the Local Arrangements Chairperson is Dr. P. Dang. There will be three symposia, a heritage lecture, a student competition, Gold Medal Address, poster session, submitted papers and meetings of special interest groups.

Secondly, the ESC will participate in the BCC sponsored Congress of Canadian Biological Societies at London, Ontario, 23-28 June 1985. Dr. G. B. Wiggins is the ESC representative on the Congress Steering Committee and Chairman of the committee developing the ESC program. At the BCC Congress, there will be ten interdisciplinary symposia:

1) Strategies of parasitism
2) Predation
3) Mechanisms of disease resistance
4) Developmental and molecular biology
5) Soil biology
6) Ageing
7) Ecology of Communities
8) Forestry
9) Bio-technology
10) Life in a cold climate, A-Animals, B-Plants.

Dr. W. G. Friend is responsible for the ESC Scientific Program. There will be two ESC symposia:

1) The Biological Survey of Canada (Terrestrial Arthropods)
2) Pheromones: Their Role in Insect Behaviour and Control.

There will also be sessions for submitted papers and poster sessions. Dr. A. D. Tomlin is responsible for ESC local arrangements. A buffet dinner and social evening will be held on Tuesday, 25 June. ESC will have a meeting and publicity room at the Congress as a focal point for the Society and its activities.

The Executive Council suggests that following the ESC Annual Meeting in 1985 the Governing Board evaluate the success of having two major Entomological meetings in the same year. It is quite probable that BCC Congresses will be held at 5-year intervals (the second in 1990), so consideration should be given to procedures to be followed, more particularly now that ESC will host the XVIII International Congress of Entomology at Vancouver, 3-9 July 1988.

First Vice-President, Dr. S. B. McIver, our representative to the Biological Council of Canada, advises that the BCC continues its activities in areas of great concern to biologists. BCC achievements during the year include:

1) *A Statement on Hiring Policy for Scientists in the Federal Government* by G. B. Wiggins
2) Support for the establishment within NSERC of an Advisory Committee on the Life Sciences is an ongoing campaign of BCC. Such an appointment was supported through correspondence by ESC
3) The appointment of Professor John Phillips, Department of Zoology, U.B.C., as a second biologist, to the Council of NSERC was recognized as a major breakthrough. ESC expressed its appreciation to Hon. Donald Johnston, Minister of MOSST
4) Following publication of *Canada's Threatened Forests* by the Science Council of Canada, BCC appointed a Committee to investigate the situation with a view to further BCC involvement. Dr. Taylor Steeves, University of Saskatchewan, was asked to Chair the Committee which is composed of one representative from each constituent society of BCC. Dr. D. C. Eidt is the ESC representative
5) Through the combined efforts of the Science Council, BCC, CCUBC and Consultant G. P. Bell, a Directory of Canadian Field Research Stations, 1983, was published
6) The 1984 BCC Gold Medal is awarded to Dr. R. H. Haynes of York University
7) Plans for the Canadian Congress of Biology with Dr. David Walden, Department of Plant Science, University of Western Ontario, London, as Chairperson are progressing satisfactorily.

The Biological Survey of Canada (Terrestrial Arthropods), with Secretariat H. V. Danks and a Scientific Committee by ESC, continues to attract international attention and recognition. Progress was reported on a wide variety of survey projects, including: preparation of

keys to families of terrestrial arthropods and faunistic studies of the Yukon, Newfoundland, glacial refugia, wetlands, grasslands, springs and soils. Other items addressed at meetings included: expansion of the survey through additional modules; establishment of a trust fund for publications; appraisals of environmental disturbances; long-term climatic changes; survey workshops and ESC rules for the Scientific Committee.

Internal

The Governing Board and its Committees dealt with a variety of items best described as internal matters. Here are a few of them, in general terms. Details may be found in Committee Reports published in the December Bulletin.

Drs. S. M. Smith and R. G. H. Downer, Department of Biology, University of Waterloo, succeeded Dr. D. C. Eidt and Mr. C. A. Miller, Maritimes Forest Research Centre, Fredericton, as Scientific Editor and Assistant Editor, respectively, November 1984.

Mr. J. A. Shemanchuk, Research Station, Agriculture Canada, Lethbridge, Alberta, will succeed Dr. W. G. Wylie as Secretary of the ESC, January 1985.

On 22 June 1984, Miss Margaret McBride advised she wished to relinquish her position as Managing Editor as soon as a qualified alternate could be found. An *ad hoc* Search Committee was formed to seek a replacement. This committee is chaired by Dr. J. M. Campbell, and is currently engaged in its task. If you are interested in this position, or know someone who might be, please advise the Committee.

The Finance Committee continues to do its good work. The following items were considered and resolved, or are in the process of being resolved:

1) Financial control in emergencies, e.g. incapacitation of the Treasurer
2) Direct printing of word process manuscripts for the Journal
3) Acquisition of a microcomputer for the ESC Office - Apple IIe
4) Reviewed the ESC Budget for 1985, and recommends acceptance
5) Expressed concern for high cost of publishing the Bulletin, e.g. $14,000. FC will ascertain if the Bulletin can be made more attractive or less costly
6) Considered and made recommendations with regards "bridge funding" to allow the *Destructive Insects - Corn, Wheat & Canola* Contract to be carried out as originally planned
7) Capital and current accounts would not be separated but interest earned on capital funds would be clearly identified in audit statements
8) Allowable expenses for persons attending governing board meetings should be actual expenses up to a maximum of the prevailing "government rate."

The Society continued its program of recognizing outstanding contributions in entomology. The 1984 Gold Medal was awarded to Dr. K. G. Davey, Dean of Science, York University. Unfortunately, there was no candidate selected for the C. Gordon Hewitt Award, for outstanding contributions by an entomologist under 40. This is the second year this has happened, and members are urged to nominate colleagues whom they know to be deserving candidates for this prestigious award.

The Publications Committee placed their illustrated advertisement "Let us take you on an Arctic Expedition" in several issues of the ESA and ESC Bulletins to try and increase sales of *Arctic Arthropods* and *Bibliography of Arctic Arthropods*, two publications produced by the Biological Survey of Canada (Terrestrial Arthropods). Samples of both books and order forms were also displayed at the XVII International Congress of International Entomology, Hamburg, Federal Republic of Germany, 20-26 August 1984. The impact of these advertisements has not been determined to date.

The Insect Common Names and Cultures Committee redrafted their 1983 provisional list of English Common Names of Insects after comments and corrections were solicited and received. The new list was prepared in a scientific name - English name/English name-scientific format. Discussions with Quebec Society for the Protection of Plants with regard to the possibility of a joint publication of the newly revised French list and the new English list of insect common names are continuing.

The Biological Control Review Committee and Microbial Insecticides Study Committee continue to make progress. Final reports are expected from each Committee in 1985.

The Bulletin, which is the principal means of within-Society communications, continues to serve the Society well. Editor Dr. H. J. Liu, and Associate Editor, Dr. B. K. Mitchell, have undertaken some excellent and imaginative initiatives. Guest editorials and Vignettes of Entomology have recently been introduced. Such initiatives are to be encouraged, so if you have any ideas for improving the Bulletin, please communicate them to the Editor, Dr. Helen Liu.

Concluding Remarks

As I come to the end of this address, I am also approaching the end of my term as President. I must acknowledge those who have served with me on the Executive Council, and Board, and those who have served on Board Committees. All have worked hard and well on behalf of the Society. I must express my appreciation to Dr. S. M. Smith, who gracefully accepted the highly demanding office of Scientific Editor, and to Dr. R. G. H. Downer who accepted the office of Assistant Scientific Editor. I am sure they will both serve our Society wisely and well in these very important posts.

I express personal gratitude to Secretary, Dr. W. G. Wylie, who has completed his third and final year in this position. Also, thanks to Mr. J. A. Shemanchuk who has kindly accepted the Secretarial position and will assume these duties as of January 1985. A very special thanks and congratulations to Dr. E. C. Becker who has completed his twenty-fourth year as Treasurer of our Society and who, on frequent occasions, performs the duties of an Executive Secretary. On behalf of the Governing Board and members of the Society, I express my sincerest thanks to our Managing Editor, Miss Margaret McBride, who will retire from this exacting post as soon as a suitable replacement is found. She has served the Entomological Society of Canada, both wisely and well, during the past eighteen years. We wish Miss McBride many happy years of a well deserved retirement. On a more personal note, I must also express my thanks to Miss Margaret Hannaford, St. John's Research Station, for willingly providing secretarial assistance throughout the year.

Ray F. Morris,
President

GOLD MEDALLIST'S ADDRESS

Research and Teaching: Generosity in the Laboratory

by

K. G. Davey*

Let me first of all thank you for the honour that you have done me in selecting me as the Gold Medallist for 1984. An honour conferred by one's colleagues and peers is an honour worth having. You will not take it amiss, I hope, when I express the view that such honours probably do not matter very much, in the sense that it is not for the recognition that I, at least, do science. This is not to say that the honour is not appreciated—I can assure you that it is a very nice feeling indeed to be recognised in this way. Even the prospect of preparing a brief address does not mar the glow. The guidelines issued to recipients are not particularly helpful, apart from a perfectly understandable, if faintly churlish admonition to be brief. Previous recipients, I know, have tended to concentrate on policy in entomological endeavours, and, given my own interest in these matters, it would be easy enough to follow in the footsteps of these distinguished colleagues.

But, may I suggest that this occasion ought not to be one which deals with science policy, which, important though it may be, is often crushingly dull, particularly for those sensible people who simply wish to get on with their science. In my view, this occasion ought to be a celebration of entomology, in recognition of our shared and consuming interest in those astonishing creatures which have commanded my interest for 35 years. It would be entirely appropriate, therefore, if I were to launch into a discussion of my most recent notions on the functioning of the endocrine system in the female insect. You may or may not be relieved to hear that I lack the courage to go quite that far, but I will certainly take you part of the distance. Nor will I entirely abandon the precedent set by my wise predecessors.

I mentioned a moment ago that it was not the prospect of recognition that drives most scientists in their work. But if it is not that which drives us, then what does? What are the forces which cause people like me to become obsessed, for that is the only term to describe what occurs, with the examination of the minutiae of the functioning of those fascinating creatures? It is simply dishonest to claim that it is the economic importance of the insects which matter to us, although I do not by that statement belittle the acknowledged enormous

**Dean of Science, York University, Downsview, Ontario*

economic importance of the group. Nor is it particularly useful to remark that insects are interesting, that they present opportunities to examine phenomena of general importance in biology.

In order to explain what drives me to ignore my family, my students, my responsibilities as dean, and virtually everything else, I will have to deal with my early life as an entomologist.

I began my professional life, as many others did, working as a summer student assistant for Agriculture Canada. At the now defunct Entomological Laboratory in Chatham, I had the privilege of an entirely informal, but nevertheless very high quality education in entomology while still a schoolboy. Under the tutelage of David Arnott, Charles Fox, Harry Wressel, George Manson and others, I not only discovered some of the fascination of insects, but learned a great deal about the importance of careful observation and the necessity for, and the rewards to be reaped from, long hours of hard work. Later as an undergraduate and graduate student I sat at the feet of Tony Brown, Leon Wolfe, Dick O'Brien and Bill Chefurka, learning not only in a formal way the elements of insect science, but also continuing the informal absorption of the principles of observation, analysis and rational thought.

But all of this work, even that which some would describe as experimental, was primarily descriptive. It was not, however, until I began my doctoral studies that I discovered what science was really about. I can best describe what I mean by telling you something of my work at that time. I was interested in the transfer of spermatozoa from the male to the female in insects, and among the specific problems that I encountered was the apparent migration of the spermatozoa within the female. In the insect on which I worked, *Rhodnius prolixus*, the spermatozoa were deposited in the capacious cavity, and then made their way up the common oviduct and into the tiny spermathecae or sperm storage organs. Conventional wisdom at that time held that for all such migrations, whether in insects or cows, it was the male gamete which played the active role by swimming in a directed fashion from one point to another. There was not a shred of evidence on which to base this assumption, apart from the fact that spermatozoa wiggled. Male chauvinism was at least as rampant then as it is now, although it was largely unrecognised. In any case, my own observations combined with my natural determination never to follow conventional wisdom led me to formulate a different notion: that the spermatozoa, motile though they were, did not swim anywhere in a directed way, but were transported up the common oviduct by contractions of the muscles of that structure.

Now the having of ideas, particularly original ideas, is important in science, but it is the formulation of those ideas as testable hypotheses which really matters. The testable hypothesis in this case made two critical and simple predictions. On the one hand, if it could be arranged that the muscles of the female were paralysed without interfering with the motility of the spermatozoa, then the hypothesis predicts that the spermatozoa would not be transported. On the other hand, if the spermatozoa could be paralysed without interfering with the contractions of the muscles of the female, then the spermatozoa would still be transported to the spermathecae. The experiments were technically difficult, although not, as it turned out, impossible. In short, the experiments, once done, worked, and worked very neatly indeed. Since then, as some of you may know, an almost identical mechanism has been discovered in dogfish and in higher vertebrates, and it was the work on insects which pointed the way. Gratifying as this may be, it is no match for the intense gratification that comes from designing a series of experiments and having them work. From that day in Cambridge when I experienced the extraordinary and very intense elation from having the experiment work, I became a sort of junkie, hooked on the pretty experiment. It became important to me to have my regular fix of designing and executing experiments; indeed, it is probably not an exaggeration to say that I am only really happy when I am in the laboratory doing experiments. All of the other activities that I engage in: teaching, deaning, and that myriad of activities which academics tend to lump together as service, but which my graduate students long ago designated as "biostitution," all of these are merely interesting, and success at any one of them can never hope to produce the rush of gratification that comes from doing an original experiment and having it work.

Like all addicts, however, we scientists demand that everything be just so in order to experience the maximum satisfaction. It does not matter very much if the experiment is important in the sense of being generally applicable, although most scientists would prefer to work on something which is important. It is essential that the experiment be "pretty," by which I mean that it should be technically a little difficult, but at the same time clean and sharply defined in the sense that any result is susceptible of only one interpretation. In other words, the so-called "critical" experiments are much more fun, and produce a greater rush than run of the mill, exploratory experiments.

I have not, you will note, said very much thus far about ideas. Conceptualisation in science is, of course, of extraordinary importance. There can be no science worthy of the

name without imagination—that is clear even to the non-scientist. The imagination must, however, be disciplined within the framework of thought which we recognise as science, and, in particular, ideas must be translated into testable hypotheses. The having of ideas, or more properly, disciplined insights, is thus an absolute prerequisite for the doing of good science. But it is not the blinding insight that produces the fun, excitement and elation in my science; the notion of Archimedes leaping from his bath to run through the streets shouting "Eureka" and proclaiming his newly developed insight has always seemed to me to be silly, and certainly misleading to the general public. The fun comes from turning the blinding insights, the ideas, into hypotheses directly testable by critical experiments or direct observation. The notion that one's mind is going where none other has been is certainly pleasurable, but the pleasure is increased immeasurably if experiment reveals that the path is correct, or at least internally consistent.

Thus, my insect science is, I suspect, like yours, done to please myself. For most of us the pursuit of science, whether it involves insects, plants, planets or molecules, is an intensely selfish activity in the best sense of the word selfish. I hasten to add that I do not intend any implication of meanness or, indeed, even vanity. I use the word selfish only in the sense of serving one's own interests first. Thus, while recognition by one's colleagues, or the sense that one is serving national goals are both sources of great satisfaction, it is not the expectation of these rewards that brings me cheerfully into the laboratory every day. The drive is entirely an inner one, and the gratification is highly personal, if not private.

Obviously, I have oversimplified the situation to some degree, but I believe that it is important to recognise that research is pretty much a selfish, in the non-pejorative sense of that word, activity. Although it is not my main point, the failure to recognise, accept, and take account of that reality is the major failure of our research managers.

Let me now turn to the obverse of this intensely selfish activity. While I am first an entomologist who gets his jollies in the laboratory, I am also a professor whose job, I suppose, involves professing insect science. An important part of professing involves teaching. Professorial-type teaching is not much in evidence at the undergraduate level, but it continues to flourish in the research laboratory where we establish our graduate students as apprentices or junior colleagues, guiding them in their first attempts at insect science.

Now if research is a selfish act, then teaching at the graduate level in the research laboratory must surely be an act of very considerable generosity. It is not so much that the researcher is asked to share his ideas, for I have already noted that ideas, in the ordinary sense of that work, are fairly easy to come by in any case for anyone who hopes to be a scientist. It is rather that the professor has to share the planning, development, and doing of some of the experiments. The act of making the pretty or critical experiment work has to be at best shared, and, as matters proceed, many of the experiments in a busy laboratory are likely to be designed and executed by students or post-docs. Thus, recent work in my laboratory has shown for the first time that ecdysterone from the ovary can have a direct effect on the brain, bringing about the release of neurosecretory hormones. This was an important discovery, and the basic idea was one which I had written about a couple of years earlier. The idea, as they say, was current. Also important in this case was the fact that we had an almost unique system which I had first described some 15 years earlier. The basic experimental approach was simple, and the design of the experiments fairly straightforward. The experiments were very pretty indeed, and technically rather challenging. More important, they worked, and worked beautifully. Alas, however, I had no direct hand in the execution of these experiments, and could not share fully in the excitement which they generated.

Thus, the professorial scientist too often has to content himself with a vicarious thrill, which is no substitute for the real thing. Such a situation, I believe, is likely to produce real tensions between the selfishness of the act of doing research and the generosity which teaching requires. These tensions, recognised and contained, are probably healthy and productive, but they require understanding by both partners. Unrecognised and unacknowledged, such tensions more often than we care to admit have been damaging, leading to bitter and even poisoned experiences for both professor and student. All too often the inexperienced researcher yearns for graduate students in order that he can prosecute his own plan of research, viewing, without realising it, his students as simply another pair of hands. That, of course, is simply wrong, and, moreover, the professor is doomed to disappointment, for he must give up more than he realises, if he really lives science. This conflict between the selfishness of the researcher and the generosity of the teacher is, in the vast majority of cases, I suspect, worked out in an entirely productive way. Certainly the chances of a real clash will be very much reduced if the entomologist-professor reserves some part of the research program for himself, so that he can continue to experience at first hand the gratification that he so clearly longs for.

That is not to say that supervising graduate students is not rewarding. Watching a

graduate student gain confidence as she begins to think like a scientist, and even more so, as she realises that she has begun to think like a scientist, is very rewarding indeed. But it can never, for me at least, replace the excitement and exhilaration of the pretty experiment that I have made to work.

ESC Gold Medal Recipient, 1984. Kenneth G. Davey (left) receives Gold Medal from ESC President Ray F. Morris, 2 October 1984, St. Andrews, N.B.

THEME PRESENTATION

34th Annual Meeting of the Entomological Society of Canada

The Atlantic Provinces: A History Shaped by Resources?

by

D. M. Young*

I still believe in gremlins. As a technician in World War II I observed how those little creatures find their way into the most perfect pieces of machinery and make it behave in unusual ways. Since planning committees are expecially susceptible to their pranks, it should not have surprised me when the preliminary draft of the programme for this conference appeared, to discover that my topic was to be 'The Atlantic Provinces a History Shaped by Resources.' Nevertheless, it did come as a shock, for two years ago I had been asked whether I would be willing to speak on the history of New Brunswick. That seemed reasonable. It was a long way in the future, and I do teach a course on the development of administration in this province. My own special field of interest and, I like to think, of competence, however, is the history of administration in the British Empire, with a secondary field in the history of Africa.

Over the last two decades there has been, if not a revolution, certainly a major revision in the interpretation of the history of these Atlantic Provinces. A great variety of specialists, from lexicographers to human geneticists have been looking into aspects of our past.

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Of course, there are still gaps in our knowledge. When I teach African history, I spend a considerable amount of time describing how the *Simulium damnosum*, *Anopheles gambiae* and *Glossina palpalis* have influenced human affairs on that continent. I call them blackflies, mosquitoes and tsetse flies.

But where does on send undergraduates for easily accessible information on entomological factors in 18th and 19th Century New Brunswick? What one finds in the general literature are casual references to certain problems in raising wheat, vague suggestions of a possible connection between the spruce budworm and the Miramichi fire, and little bits on insecticides for potato beetles and other garden and orchard pests. There is of course no difficulty in finding information on the years after World War II, for the arrival of DDT in New Brunswick had consequences which have been widely discussed both in the newspapers and in scientific journals.

Maybe I am unduly suspicious but I think that the gremlin who framed the topic, *The Atlantic Provinces; a History Shaped by Resources*, was implying that the historical profession in Atlantic Canada is not yet sufficiently versed in the knowledge and wisdom of the scientific community. With that I would agree. But I do disagree with what seems to be the gremlin's own philosophy of history, that humans play no part in choosing their own destinies.

At the University of New Brunswick after the war, I had the good fortune to attend the classes of Professor Alfred Goldsworthy Bailey. Dr. Bailey devoted a great deal of time to exploring the question of how it happens that at certain times and under certain circumstances, there are outbursts of creativity and inventiveness in human communtities. How it comes about that at times society undergoes great changes, whereas at other times there is little evidence of genius at work.

In exploring the avenues of historical causation, he sent freshmen students to study the idea of geographic determinism as put forward by the nineteenth century theorist Ellsworth P. Huntingdon. Honours students were sent to read Arnold Toynbee's *Study of History* in the original multivolume edition then being published. Toynbee argued that human societies became creative through meeting and overcoming successive challenges. If they are not challenged sufficiently, people become lazy and self-satisfied. If the challenge is too great, people use up their energies in surviving and have nothing left over for creative endeavours. In between the two extremes, Toynbee thought, there was a golden mean, where the challenge was just right and where people responded by becoming vigorous and creative. Of eastern North America, he wrote that the optimum challenge had been presented in Massachusetts. This had led to the creation of the rich heritage of New England. To the southward in New York, Pennsylvania and Virginia the challenge was too gentle to bring out the best in the settlers. To the northward of Massachusetts the challenge was too great, so that Maine had developed slowly and not to a very high level.

> "the contrast between Maine and Massachusetts comes out much more clearly" he wrote, "if we extend our survey farther northwards to the rest of the English-speaking communities along the Atlantic seaboard of North America. New Brunswick and Nova Scotia, are the least prosperous or progressive provinces of the Dominion of Canada with the exception of their north-eastern neighbour, Prince Edward Island. On the northern side of Cabot Strait, the Island of Newfoundland is the least reputable of all the self-governing communities of the British Commonwealth of Nations. And," Professor Toynbee, added "on the northern side of the Strait of Belle Isle, the English-speaking fisher-folk along the bleak and barren north-east coast of Labrador are fighting, at this day, the same tragic losing battles against over-whelming physical odds that was once fought out to the death, on the opposite side of Davis Strait, along the south-west coast of Greenland, by those forlorn Scandinavian pioneers whose last survivors perished some five centuries ago."

Toynbee's assessment of these Atlantic provinces echoed in the reports of economists of the Rowell-Sirois Commission in 1940 and of those bureaucrats who planned the transition to peacetime—which they called 'reconstruction'—at the end of World War II. The picture of 'chronic depression' presented in some reports made Arnold Toynbee look like an optimist.

In 1946 Dr. Bailey wrote:

> "Although Mr. Arnold Toynbee does not write hopefully of this eastern region, students of his great work will be familiar with the fact that time and again throughout history men have successfully responded to the challenges of hard ground and penalization by redirecting their creative energies into possible channels leading to fruitful ends."

Dr. Bailey's fear was that Canadian scholars were paying so much attention to the interaction between people and their physical environment that they were losing perspective and tending to forget that people also live their lives in a web of cultural patterns. When Arthur Lower wrote that it was 'curious' that it was 'the sterile soil of New Brunswick' that had produced two of the most distinguished and most distinctively Canadian writers to emerge in the post-Confederation era, Dr. Bailey countered with a brilliant essay drawing attention to the existence in the nineteenth century Maritimes of a literary culture whose writers and readers kept in touch with the wider world.

Arthur Lower was a pioneer member of the school of historians who, about half a century ago, began to reinterpret the history of Canada. They treated British North America as an "open" community or series of communities, 'open in the sense that its economic life has been dominated by a continuous inward and outward flow of people, enterprise, commodities and capital.' The Atlantic Provinces were pictured as being like a yo-yo on a string, utterly dependent on economic forces in Western Europe until the mid-nineteenth century, when they came to be completely at the mercy of economic forces emanating from other parts of North America.

This interpretation of the historical process was based, especially in its earlier years, on a series of concepts borrowed from economics, known as 'staples theory'. It explained how Canada had been shaped along an East-West axis in response to international demand for our great trading staples, furs, lumber and wheat, the St. Lawrence River being the highway through which exports and imports flowed.

The man who led Canadian scholars in applying this theory was Professor Harold Adams Innis, probably the greatest figure that Canada has produced in the field of the social sciences. After writing a great work on the fur trade, Innis turned his attention to the cod fishery. With his usual thoroughness he made himself familiar with the geography and with the people of the Atlantic region. At a public dinner in St. John's he remarked to the mayor that it was unfortunate that they did not know where John Cabot had landed on his voyage of 1497. The mayor, an old traditional politician, replied: "We knows! Of course we knows! He landed right in this here 'arbour'."

It is said that in the tentative arrangements for the recent papal visit, the schedule called for his Holiness to land first in Newfoundland. The Newfoundland committee was upset when these plans were changed. They resented the impression that the man responsible for planting the cross on this coast was Jacques Cartier, a "Johnny-Come-Lately" who arrived thirty-seven years after Cabot's voyage.

I do not have any intention of getting involved in that debate. In terms of staples theory, the vital point for Europeans was that they had discovered one of the greatest protein factories on the face of the earth. Fleets of tiny ships set out from the ports of western Europe every spring and returned in the autumn with fish and whale oil. By the seventeenth century the English were outfitting up to two hundred or more vessels each year to take cod in Newfoundland waters and there were fisheries, mostly French and British, extending from the Strait of Belle Isle in the north to Massachusetts in the south and from Gaspé and the mouth of the St. Lawrence in the west to the eastern tip of the Grand Banks in the east.

When plantation agriculture developed in the West Indies, the lower grades of fish became a vital part of the diet of the West Indies slaves. In turn, rum and molasses from the West Indies became staples in the everyday lives of people from Massachusetts to Newfoundland. Fifty years ago rum puncheons and molasses hogsheads, those 18th century substitutes for plastic containers, still served a variety of uses on Maritime farms.

In his studies of the fur trade and the fishery, Harold Innis drew attention to how ready access to the sea affected the historical development of the Atlantic coast. Put simply, competition prevailed because it was impossible for any central authority to regulate the comings and goings of trading vessels in the many coves and harbours. On the other hand, the company or country that controlled the lower reaches of the St. Lawrence River was in a position to regulate the shipping entering and leaving the river, and by extension to manage the fur trade of the hinterland as a virtual monopoly. Whereas Montreal's location made it possible for that city to grow into a dominating metropolis, the Atlantic provinces had a number of competing communities, but no strong centre.

Fish was such an important item in Atlantic trade that Edmund Burke declared in 1766 that the most important trade the British had in the whole world was that with Newfoundland. The French government spent a fortune in building a naval base at Louisburg to defend its share of the trade—and the Canadian government another fortune in rebuilding it as a museum. Even in defeat France continued to share in the fishery from its base in St. Pierre and held rights on the western shore of Newfoundland until 1904.

When I went to Newfoundland to teach at the Memorial University in 1954, I came to appreciate how eighteenth century people looked at the relationship between the sea and the

land and what it is like to stand on rocks looking out at the ocean without having a road at one's back. Outport students had a 'wonderful' appreciation of the world of saltwater. 'Wonderful' was the universal adjective for anything unusual. Things could be 'wonderful good' or 'wonderful bad'—in some of the students, the 'wonderful good' feel for the sea was balanced by a 'wonderful bad' ignorance of the basic principles of continental geography.

Among the nations pursuing the fishery the men of the British Isles were, in the words of a poetic geographer 'the seabirds that most often rested on the shore'. The transformation of a summer base into a resident fishery took place in the 18th century. That the settlements were mainly British rather than French was undoubtedly important in determining their shape. If they had been French, it seems likely that an effort would have been made to concentrate the population. Under the British it spread into every available nook and cranny along the coastline.

Poverty and isolation are great preservers of old ways of thinking and behaving. The fishermen were self reliant but not independent. Their lives were full of uncertainties arising both from the vagaries of nature and the pattern of world trade. A good deal of food had to be imported, for there was very little agricultural land near the settlements. The fishermen produced for customers who were far away and they did not adopt readily to changing tastes or changes in technology and marketing.

The transportation revolution of the late nineteenth century also worked to Newfoundland's disadvantage in its relations with the outside world. In the eighteenth century the outports were on the world's great highway, the sea. By the twentieth century they were out at the end of a very long road of a continental system of transportation.

For generations Newfoundlanders have been asking the question. How does it happen that people producing vast quantities of an essential and valuable commodity suffer so severely from poverty and deprivation? The answer that has echoed for a century or more through historical and political writing is that a few wealthy fish merchants established and maintained a system of credit slavery and political manipulation through which they exploited the honest and hard-working fishermen.

The theme of tension between resident servants and distant masters echoes through the pages of Newfoundland political writing. When the Pope stood on the beach at Flat Rock and appealed to the fishing companies to pay more attention to the needs of the fishermen and their families and less to the profit margin, he struck a responsive chord in the Protestant majority as well as in those of his own faith.

By far the most influential of the historians who have helped Newfoundlanders to shape their understanding of themselves was Old Judge Prowse whose *History* was first published in 1895. A Newfoundland nationalist and patriot, crusty, opinionated, partisan, and often wrong-headed, he was seldom dull. His emphasis, says a recent writer, "was on the unromantic codfish, on salt and fishing gear and boots and rum." Years as a magistrate pursuing lawbreakers on the south coast had made him appreciate the spirit of the outports.

People there looked upon the cargoes of wrecked ships as legitimate prizes in the lottery of life. Prowse told of an old Irishwoman who had her own version of what shapes history. Speaking of one 'wrack', she said:

> "I don't know what God Almighty is thinking about, sending us a terrible bad fishery, and then an old Norwegian brig full of nothing but rocks."

Could the people of Newfoundland have created a more efficient fishing industry and thus brought greater prosperity to the province? The late Professor David Alexander of Memorial University believed that they could have. He wrote:

> "The fact that Iceland, a staggeringly impoverished and exploited country in the 19th century with no significant commercial fishery before 1890 and with fewer alternative resources than Newfoundland, was nonetheless able to extablish itself as an independent and prosperous country on the basis of the North Atlantic fishery invites a fresh examination of the opportunities that existed in Newfoundland."

His research led him to the conclusion that Newfoundlanders themselves were only partly to blame, for the banking and business world outside the province was too hasty on a number of occasions in dismissing opportunities for investment.

In contrast to the vastness of the fishing frontier, the agricultural frontier in the Atlantic Provinces was initially very small. Professor Andrew Hill Clark and his students and disciples in the field of historical geography have examined it in great detail, beginning with the early success of the settlers at Port Royal in the Annapolis Valley c. 1650. By applying a technique for draining salt marshes, rich pastures were created on the tidal flats on the southern and

western shores of the Bay of Fundy. Fruit orchards were planted on the higher ground. With the healthful climate and excellent food supplies, the population grew to over ten thousand by 1750. These were the French-speaking Acadians, whom Longfellow in his poem *Evangeline* represented as the incarnation of gentleness and piety in a land of peace and plenty. There is something comforting and reassuring about farming and our culture is rich in images associating agriculture with contentment and prosperity.

The new generation of Acadian historians have shown us that early Acadian life was never so isolated or so bucolic as that represented by Longfellow. The Acadians were a farming people but they also engaged in shipping and in trade. The removal of the Acadians from their Bay of Fundy homes in 1755 is the best known event in the history of the Atlantic Provinces. Their dispersal by the English of old England and New England, which historians call *le grand dérangement*, is the stuff of literature, of myths and legends as well as of social, political, diplomatic, military, demographic and psychological history. Out of their exile the Acadians emerged with a sense of identity as a distinctive people. The story of their return and their setting up of new homes, in many cases in areas where they combined fishing with farming, has not received the attention it deserves. Of all Maritimers, apart from the Indians, the Acadian communities have relied most completely on local resources. Some became prosperous, but there was also desperate poverty, notably in northern New Brunswick in the 1930's. I can never forget meeting a young Acadian in a lumber camp in 1941. When he heard that I was a schoolteacher, he started to cry, dropped down on his knees and begged me to teach him to read and write.

In 1884 the Acadians adopted a distinctive flag. It was a symbol of their reemergence into public and political life in these provinces. This year they have been celebrating the hundredth anniversary of that event. It has been a much more joyous occasion than it promised to be fifty years ago.

On land at Grand Pré from which the Acadians were driven in 1755 stands the Evangeline monument that commemorates the tragedy of the expulsion. Nearby is Acadia University, in origin a Baptist institution founded by the descendants of settlers, mainly from New England, who moved into the Bay of Fundy farmlands in the 1760's. Together, the monument and the University symbolize the demographic revolution in the cradle of Maritime agriculture in the mid 18th century. This change in population and culture was not accompanied by any major change in the method of exploiting the great natural resource of the marshlands.

The other side of Nova Scotia along with Prince Edward Island and Cape Breton was settled by Scots who began to arrive about a decade after the New England Yankees. They came with a ready-made tool kit of ideas and institutions from a nation that wrestled with an environment not too far different from the one into which they moved. They even brought their own quarrels.

It was a Presbyterian minister on Cape Breton Island who gave thanks in his prayers for 'the Gut of Canso! God's body of water that shields us from the corruption and baneful desolation that prevails on the far shore.' The people on the far shore were Scottish Roman Catholics. He looked upon them as feckless. They were guided by a different vision and created a different pattern of community life. The Catholic educational centre came to be St. Francis University at Antigonish — The Presbyterians received their enlightenment at Pictou Academy where the emphasis was on vigorous application and study, and on finding ways to individual material and intellectual enrichment.

That corner of Nova Scotia became the most diverse economically and one of the most creative in the Maritimes, with a mixed economy based on farming, forestry, fishing, mining and manufacturing.

Between World War I and World War II, St. Francis Xavier provided leadership and inspiration for an attempt to create institutions that would give people more control over their own lives. This became known as the Antigonish Movement. It put forth a co-operative and credit union philosophy on a non-denominational basis. Co-operatives became particularly important in the fishing communities, including the Acadian areas. Earlier and quite independently William Coaker had organised a union of Newfoundland fishermen based on a self-help philosophy. It became a political force in that province.

There are historians who argue that the Antigonish movement arose out of a corporatist rather than a democratic socialist philosophy. It may have, but I remember hearing David Lewis tell of his first visit to St. Francis Xavier back around 1940. He was then a very young national secretary of the CCF and Roman Catholic Church authorities had still not pronounced the CCF to be an acceptable political movement. His own background in Poland and in the Jewish community in Montreal had led David Lewis to look upon Roman Catholic priests as arch reactionaries and yet, he said, for the first time in Canada he was hearing socialism being discussed intelligently in a university common room. His eyes could not believe what his ears were telling him. St. Francis Xavier is, of course, Brian Mulroney's *alma mater*.

At the political centre of the diverse Nova Scotian communities was Halifax, founded in 1749, with British taxpayer's money, as a base for the defence of British interests against the French at Louisburg. At the very beginning of their history the people of Halifax discovered that there is no natural resource to compare with the treasury of a modern centralised state. Their local natural resource was and is the location of their excellent harbour on the North Atlantic shipping lanes. I think that there will be few to dispute that Halifax throughout its history has made remarkably efficient use of its resources.

The pleasant landscape of Prince Edward Island tells its own story. Farming and fishing provided the base for a subsistence economy. To supplement it, there was a commercial economy based on shipbuilding and on the export of food. Markets were near at hand in the lumber camps of New Brunswick and, later, in the manufacturing centres of the adjoining provinces. Once the best land was occupied, the population remained stable for decades. This meant that the natural increase was taken care of by emigration — but Prince Edward Island was not subjected to the dramatic fluctuations that afflicted its neighbours.

When, two hundred years ago, the leading Loyalists were planning their future in New Brunswick, they too dreamed of a society based on agriculture and commerce, with an ordered hierarchy. It was to be, in Edward Winslow's phrase, 'the most gentlemanlike on earth.' But the province's wealth lay in its forests and when Napoleon forced Britain to turn to the North American colonies for wood, New Brunswick responded more quickly and more thoroughly than any other province. Scots credit and managerial talent, Yankee experience and Irish muscle created a robust and rather anarchic community. By the time of Confederation the Irish and their descendants were more numerous in New Brunswick's population than the descendants of the Loyalists, but Fredericton and St. Andrews survive to show us that the Loyalist dream of gentility did not die.

There were really two New Brunswicks. The south-west, which was settled first, was made up of the coastline of the Bay of Fundy and the rivers flowing into it. Ships sailing between St. Andrews and Chatham in the northeast had to navigate all the way around Nova Scotia. Merchants in the northeast dealt directly with Liverpool and Glasgow. So did the merchants in the south-west. But they had very little contact with one another, except when they met in the legislature.

The farms and the forests and streams provided an important part of the subsistence of the pioneers but it was trade that really supported the growing population. There are five distinct phases in the exploitation of the forest, each with its own characteristics in the type of business organization that it required and in the style of living that it encouraged.

These were:

(1) the fur trade
(2) the provision of ships' masts for the Royal Navy during the American War of Independence
(3) the timber trade; beginning on a large scale around 1809, this involved the production and shipping of large quantities of ton timber squared by hand using broad axes
(4) the lumber trade, based on the production of machine sawn planks and deals; the lumber trade used mostly second growth trees
(5) the pulp and paper industry; after a slow beginning it gained a dominant position about the end of World War I.

At each successive stage after the second, the trees became smaller and the organizing companies larger. New Brunswickers regularly expressed concern over the ability of the forest to continue to sustain the extraction of so much wood. James Robb, who came to King's College Fredericton in 1837 and was one of the pioneers of scientific education in Canada, saw the future in terms of scientific agriculture and greater economic self-sufficiency, rather than in continued dependence on the forests. Sustained scientific attention to the problems of the New Brunswick forest came only in the 20th century, with the establishment of a course in scientific forestry at the University of New Brunswick in 1908.

Between 1815 and 1850 the timber ships operated like a great pump, carrying wood to England and returning with cargoes and with passengers, many of whom moved on to other places. Professor Graham Wynn of the University of Victoria has analyzed the historical geography of that era in his book *Timber Colony*.

As lumbering advanced so did agriculture but the farmers were never able to keep up with the needs of the large labour force employed in the woods, in the sawmills and in the seaports. Even in the 1850's a great deal of food was being imported. At every downturn in the economy, numbers of people left the province. Those who remained turned their attention to their other resources. When there was little money around they brought more land into cultivation and

agricultural production increased. The acreage of cleared land reached its greatest extent around 1900. Trees are now growing again on many of those fields.

In the forthcoming book Professor William Acheson analyzes the economic, political and cultural factors that went into the shaping of the city of Saint John. He is particularly interested in the businessmen. At one point Saint John was the fourth busiest seaport in the world. The exports and imports of the Saint John Valley passed through its harbour and it was the supply and technical centre for the shipbuilding industry of the Bay of Fundy. In assessing the contribution of shipbuilding to the economy and its role in society he has been able to draw upon the records and the scholarship of the Maritime History Programme at the Memorial University of Newfoundland. That University has about half a mile of shelving filled with detailed records of British registered ships, which of course includes the many large ocean going ships that were built in these provinces and those that sailed in their shipping fleets.

In joining Confederation the Maritime colonies turned their backs on the sea and became part of a continental economy. This political reorientation occurred at about the same time as the great technological revolution which at sea saw the steamship displace the sailing ship, and which on land saw the building of transcontinental railways.

There is a popular version of Canadian history which intimates that Maritimers took one look at the mess that they had got themselves into, turned their backs on the future and went into a steady and permanent decline — like a balloon which collapses from a slow leak. That's the romantic version, and the impression one might gain from the NFB film *Empty Harbors, Empty Dreams*. It's not true. The economy didn't decline slowly. It declined rapidly and the transition was painful. During the great world depression that set in just after Confederation, tens of thousands of people left for New England and the west. Those who departed included many of the young, the educated and the better off. The English-speaking population of New Brunswick went down significantly despite a high rate of natural increase. This, plus some immigration from Quebec, brought about a dramatic shift in the demographic balance, the proportion of French in the population increasing from 15.7 per cent in 1871 to 24.2 per cent in 1901.

But there is another side to the story and it brings us to the effects of the new technology, the railway, and to our remaining resource frontier, mining. Under the national policy adopted by Canada in 1879, American coal became more expensive in Montreal than Nova Scotia coal, and it became economic to manufacture steel in the Maritimes. The national policy also provided protection for the manufacture of sugar, cotton goods and some other commodities. Local entrepreneurs in Yarmouth, St. Stephen, Marysville, Saint John, Moncton and other centres took advantage of the opportunity to introduce new industries into their communities.

In the 1880's Nova Scotia's per capita growth in manufacturing was the highest in Canada and the growth of manufacturing in Saint John, New Brunswick exceeded that of Hamilton, Ontario. Nova Scotia pig iron production multiplied seventeen times between 1900 and 1917. Capital investment in manufacturing increased over 400 per cent in Nova Scotia and 500 per cent in New Brunswick between 1900 and 1920.

Since we are in St. Andrews I must also mention the tourist industry. This community was reborn at the beginning of the railroad age to serve the wealthy folks from Ontario, Quebec and the United States who arrived each summer to spend leisurely months breathing sea air and observing the local natives. It was the beginning of an industry in which both our professions are involved, for while natural scientists watch over beaches, nature parks, whales and Atlantic salmon, historians look to the preservation and display of historical resources.

Local pride is strong in these parts and there used to be a special pride in provincial sons and daughters who left home and made a success of their lives in the great world. When a Burpee from the St. John Valley founded a firm that developed a burpless cucumber, it reflected glory on all the cousins back home. When in the late 19th century a dozen or more of the university presidents in Canada and the north-eastern United States were graduates of Pictou Academy, the whole region basked in the fame of our educational excellence.

In my generation schoolteachers led us to believe that coming from the Maritimes we would be immediately recognized and welcomed in far places. If not as future prime ministers, or as writers or scientists, at least as good workers. I do not suppose any group had that illusion so quickly dispelled as a detachment that arrived at the R.C.A.F. Manning Depot at Lachine, Quebec in January 1942. At the barracks, a great big fellow came to meet us. He worked his way down the row of bunks like a politician, giving a jovial greeting to a draft of fresh-faced young men from Windsor, Ontario, then shaking hands very politely, even deferentially, with some hardrock miners from Flin Flon, Timmins and Sudbury. When he reached our small contingent and asked where we came from, he paused:

"So you're from New Brunswick! Am I ever glad to meet you! I didn't know there were any men in New Brunswick! Only women! Every prostitute in Montreal says that she comes from New Brunswick!"

The collapse of the Maritime economy came at the end of World War I, half a century after Confederation. Professor Forbes in his book on the *Maritime Rights Movement* presents convincing arguments that Maritime difficulties came about at least in part, as a result of changes in transportation, tariff and other policies of the Canadian government.

Between 1919 and 1926 tens of thousands of people left the Maritimes. Among them were a very large number of skilled people. At one engineering plant in Amherst 350 of the 400 highly trained employees were laid off, with most of them moving to the United States.

In the 1920's the older generation still knew the techniques for living off the land. There was fuel from the forests and the mines. There was land that could be brought into cultivation. There were horses and cows and there was hay to feed them. When the 1930's brought the tragic depression throughout the rest of Canada, there was even a wry satisfaction in seeing the exiles returning to a countryside that was able to provide the basic essentials of food and shelter. But it was a world where there were pockets of desperate poverty.

The Maritimes of the depression years produced that most compassionate of our writers, Alden Nowlan, who won a governor-general's award for poetry in 1967. He grew up in an area where the soil was too poor for farming, where there was 'A great feeling of insecurity all the time.' Of his father he said 'he's always wanted to work, but he's never had a permanent job.'

There is a grandeur in the human spirit that enables some individuals to respond creatively to challenges. The remarkable paintings of Jack Humphries and Miller Brittain from the 1930's are a reminder of this.

In the 1880's Newfoundland, like Canada, had its national dream. Premier Whiteway looked into the future and saw: 'trains laden with minerals, timber and agricultural produce, passing from the smiling field and gardens of the West, on their way to the market in the metropolis' of St. John's. It was not to be. The resources were not there, though new technology did bring advances in the form of hydro-electric power and the pulp and paper industry in the early 20th century. A dramatic new resource was unveiled in 1940 when Newfoundland became a forward base for the exercise of American power in the northwest Atlantic. American and Canadian military establishments made an enormous impact. In addition, the Big Dipper Lounge at Gander Airport was for several years after the war the crossroads of Trans-Atlantic air travel. It was all to be temporary, for the development of efficient long range airplanes brought an end both to the American garrisons and the prosperity of Gander.

Perhaps I have said enough to indicate that while resources have been vital, no single factor, not even the presence or absence of resources can be said to have determined the history of Atlantic Canada. Local institutions and the ideas and attitudes of the local people have been important, and international politics, Canadian federal politics, the banking fraternity and the institutions and practices of the wider commercial and industrial world have all played significant roles in the shaping of our history.

I do not subscribe entirely to the Sir Walter Raleigh's dictum that the historian who follows too closely on the heels of his subject is likely to get kicked in the teeth, but I do not propose to deal with the period after World War II. There have been major developments in mining in both New Brunswick and Newfoundland. In the years immediately after the war, rural life was transformed in all provinces by the extension of electrification. Mixed farming was dealt a deathblow by the legalization of the sale of margarine. Attitudes to birth control changed and made a dramatic demographic impact. By the 1960's, however, the engine driving our economy was the government of Canada, not the exploitation of our natural resources.

There has been a dawning realization that the resources of the sea are as finite and their renewal as precarious as those of the forests and the land. There has been a serious effort to make maximum use of certain advantages of location, but our recent history has been shaped in large part by highly funded social experimentation and by the provision of educational, health and social services and research facilities not dreamed of by past generations.

No doubt the gremlins will let us know in due time whether we shall have to pay the bill.

THE HERITAGE LECTURE

Entomology — In Days of Yore (Atlantic Canada)

by

Ray F. Morris*

A knowledge of the past helps us in charting our course for the future. Last year, Dr. Paul Riegert delivered the first of our Heritage Lectures when he spoke on Thomas Nathaniel Willing, Pioneer Prairie Naturalist. Today, I am honored to have been invited to deliver the second lecture.

This year I hope to share with you the life histories of some of the prominent early entomologists who established our discipline in Atlantic Canada. Some were the pioneers of economic entomology — hence this lecture is especially appropriate to our symposium theme "Entomological Perspectives on Resource Management". It is a tall order, but I hope I can meet the challenge.

In the short time available to me I have to consider early entomological development in four provinces: Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island. Fortunately, entomological development had a similar pattern in all provinces. This is not unexpected as all provinces having a somewhat similar climate and vegetation have common insect problems which are rather distinct from those of other parts of Canada.

Entomology in Newfoundland

Let us look at Newfoundland first, it is the oldest and, for obvious reasons, I know it best. The first study of Newfoundland insects was made by the wealthy young British naturalist, Joseph Banks, in the 18th century. Banks is best known for accompanying Captain Cook on his voyage around the world from 1768 to 1771, but, few people realize that he had made an earlier voyage of 4 1/2 months to Newfoundland and Labrador in 1766 collecting plants, animals, birds and insects. His collections were recorded in 1971 by Dr. A. M. Lysaght in a book entitled *Joseph Banks in Newfoundland and Labrador 1766, his diary, manuscripts and collections*. Many of the specimens now in the Banksian cabinets in the Entomology Department of the British Museum lack locality labels and it is possible that some of these could be from Newfoundland, but confirmation of this awaits the inspection of the specimens by someone with experience of the Newfoundland fauna.

Another early pioneer in Newfoundland entomology was the famous British naturalist Philip Henry Gosse, who observed butterflies on Carbonear Island between 1832 and 1835. In 1882, Gosse wrote to William Saunders, Editor of the Canadian Entomologist, informing him how he had studied the insects of Carbonear very intensively for three years. He had made careful drawings of nearly every species he found and these had been bound in a book called *Entomologia Terrae Novae*. He felt that American and Canadian entomologists might be interested in the Newfoundland insect fauna and he offered to send Saunders the book.

The records of the butterflies from Carbonear Island were published in the Canadian Entomologist in 1883. Unfortunately, Saunders was not interested in the other groups and they were not recorded. However, in 1930, Dr. F. A. Bruton of Somerset, England, published a paper entitled *Philip Henry Gosse's Entomology of Newfoundland*. Bruton describes Gosse's Book *Entomologia Terrae Novae* as a small book of 60 to 70 pages containing nearly 250 beautiful hand-painted illustrations of insects, larvae and pupae. Bruton had the insects identified and classified by the British Museum of Natural History and they are listed according to order in his paper.

Entomologia Terrae Novae is now in the National Museum, Ottawa. None of Gosse's specimens are known to exist today — they are believed to have been lost during Gosse's visit to Mississippi in 1835. For me it was thrilling to look through Gosse's book at Ottawa in 1975 and to select one of his paintings, the short-tailed swallowtail, *Papilio brevicauda* Saunders, as a frontispiece for my book *Butterflies and Moths of Newfoundland and Labrador — The Macrolepidoptera*. It was hard to believe that such colorful and accurate illustrations were nearly 150 years old.

Shortly after Gosse's visit to Newfoundland, Norwegian naturalist, Peter Stuwitz, was sent to Newfoundland in 1839 by the Swedish-Norwegian Government and he stayed at St. John's until his death in 1842. Although his main task was to investigate the fishing industry, he found time to collect insects as he travelled around the island. These insects were sent

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Philip H. Gosse, while working as a clerk with a mercantile firm at Carbonear, Newfoundland, from 1827-1834, collected insects and published his Entomologia Terrae Novae *in 1835.*

back to Norway and are still preserved at the Zoological Museum in Oslo. They are labelled "Newfoundland, P. Stuwitz", but unfortunately the localities are not included.

The North American literature on Newfoundland insects is very limited. Early partial lists were recorded by Bates in 1875 and Edwards in 1883 and early collecting records for Labrador were given by Møschler in 1860, Packard in 1868, 1888 and 1891 and Scudder in 1875 and 1895. Most of these entomological works in the earlier days were in the collecting and classification of insects.

The first native born Newfoundland entomologist was H.A. Butler. Graduating from Macdonald College in 1921, Butler was Deputy Minister of Agriculture for Newfoundland from 1931 to 1934, and then from 1937 to 1949, when Newfoundland was governed by a Commission, he was "Insect Control Officer". It was during this latter period that "H.A." developed his great interest in entomology. While seeking advice on methods and materials to control vegetable, household and forest insect pests, he made many contacts with officials of the Entomology Division of CDA in Ottawa.

In 1949, when Newfoundland became Canada's tenth province, "H.A." organized the Field Crop Insect Laboratory at St. John's and was appointed Officer-in-Charge, a position he held until he retired in 1957.

Although "H.A." published very few scientific papers during his wide and varied career, he made a major contribution in entomological extension throughout the province. In addition, he obtained and distributed throughout Newfoundland several millions of parasites to

combat such important forest pests as the European spruce sawfly, the spruce budworm, the larch sawfly, and the satin moth. He also introduced a bacterial disease that helped to combat a serious infestation of the hemlock looper.

I started working with "H.A." in 1950 and remember him best for his theories on the probability that insect larvae become airborne in southern areas, then carried aloft by wind storms, and literally fall out over Newfoundland. He has reported larval fall-outs on several occasions and has even found larvae in fishing boats anchored off-shore. When I offered a possible explanation or an alternative solution, he would retaliate and say "but how do you explain that one time, as I walked along Water Street in St. John's, the larvae actually fell from the sky and landed on my hat."

A silvicultural forest research unit at St. John's was established by the Federal Government in 1949 with a summer field station for forest insect and disease research being established at Georges Lake, Western Newfoundland in 1950 and 1951. During this period research on insects and diseases was initiated by Joe Carrol and Bill Parrot, and in 1953

First Canadian Forestry summer field station established at Georges Lake, western Newfoundland, 1950-1951.

they assumed responsibility for the Insect and Disease Survey. In 1952, the field station became a year-round operation, with permanent forest entomology and pathology units being established at Corner Brook. Accommodations at Corner Brook were provided by Bowaters until a new laboratory was constructed in 1956. In 1966, the two federal forestry research units in Newfoundland was amalgamated to form the Forest Research Centre at St. John's, and the Corner Brook laboratory was closed.

Early Entomology in Nova Scotia

The rather slow beginnings of entomology in both Nova Scotia and New Brunswick had their origins in taxonomic interests of non-professionals. Though Taxonomy is fundamental to applied entomology, the science of taxonomy in the Maritimes has never received federal government support.

The early history of entomology in Nova Scotia has been well described by Pickett and Payne (1939). Prior to 1882, little attention had been paid to the study of insects in Nova Scotia except by a number of private individuals. An early collection of Nova Scotia insects made in 1830 by Lieutenant Redman were mostly Diptera, and these insects are now housed in the British Museum. Collections of Lepidoptera, Coleoptera and Homoptera were made during the next 50 years by a number of individuals—Belt, Jones, Bethune, Silver and Downes. In

1896, H. Piers reported on the Orthoptera of Nova Scotia, and recorded an outbreak of the migratory grasshopper, *Melanoplus sanguinipes* (Fabricus), on Sable Island that caused a shortage of food for the native horses. As a result, shipments of hay had to be sent to the Island—this is one of the earliest records of the economic damage that can be caused to forage crops in the Atlantic Regions by insects.

Lord, F.T (1983) records three important insect collections in Nova Scotia:

(1) The collection of Professor H.W. Smith, started at Truro after 1886, was intended for student use. This collection continued to grow, particularly after the Agricultural College was founded in 1905. It was a fine, well-referenced collection under the direction of H.G. Payne, but unfortunately was lost in the tragic fire of 1946.

(2) The second important collection of N.S. species was also built up over many years at the Annapolis Royal Entomological Laboratory. Owing to the interests of G.E. Sanders, the collection contained some 3,000 specimens by 1919, and since then it has been greatly expanded by F.C. Gilliot and H.T. Schultz. The collection was moved to the new Science Service Laboratory at Kentville in 1951 and now contains approximately 10,000 specimens.

(3) The largest and best known collection in Nova Scotia is maintained in the Nova Scotia Museum of Science in Halifax. It was begun shortly after 1899 when Harry Piers, an orthopterist of note, became curator of the museum. In 1918, the museum collection consisted of 2,000 fully described specimens. The collection of Lucy C. Eaton and A.H.C. Richards had been purchased in 1906 and 1909. During the period 1934-1946, J.H. McDunnough, Chief of the Division of Systematic Entomology in Ottawa, collected Lepidoptera in Nova Scotia. From 1946 to 1965 the museum collection was further expanded by D.C. Ferguson. Barry Wright assumed responsibility for the collection in 1965 and added his large private collection of Paleoarctic and Nearctic Coleophoridae. By 1981, the museum collection had expanded to 325,000 specimens.

Economic Entomology in Nova Scotia

In 1865, the Provincial Government of Nova Scotia initiated the Nova Scotia Journal of Agriculture which continued publication until 1885. This provided a vehicle for dissemination of agricultural information to farmers, and some interest in insect control was promoted. The remedies contained in the N.S. Journal of Agriculture are perhaps more interesting as a record of control concepts than of successful remedies. As an example, here is a portion of an article concerning the turnip fly, *Delia floralis* (Pallen).

> "This insect attacks the infant plant as soon as it expands its cotyledons and sometimes destroys whole fields. Various remedies have been proposed, such as: burning the stubble; application of odorous manure distasteful to the fly; mixing seeds with sulphur; excessively thick sowing in the drill to provide for the insect and have a crop left; steeping the seeds in water to promote rapid germination; sowing hot lime over the young plants; watering every other day—five or six times if necessary; catching flies in tarred cloth; fumigation by burning rubbish to the windward of the field; drawing freshly painted boards over the field; an application of worm-wood; powdered sulphur strewn over the seed bed; snuff; and heavy rolling."

Although the practical value of these suggestions would not have been great, they do provide an excellent picture of the interesting remedies offered to farmers. However, the article contains one of the earliest known references to the use of sulphur as an insecticide in Nova Scotia.

The discovery in 1881 that the Colorado potato beetle had gained entry into Nova Scotia was a startling development for farmers and it prompted government authorities in Nova Scotia to take an active part in organizing the control of this very important pest.

The following excerpt is taken from the reports of the Central Board of Agriculture to the Provincial Secretary in 1882, p. 34.

> "During last year the so-called Colorado or Potato Beetle, which has been so destructive to the potato crop in other parts of America, has begun to show itself in Nova Scotia. The Board has collected information as to the best means of destroying it, which will be diffused among farmers at the proper season. Persons in whose neighbourhood the insect may appear are invited to apply to members of the Board for circulars or advice."

This and a further reference to the Colorado Potato beetle the following year appear to be

the only references to insects in the annual reports during the 21 years of the Board's existence (from 1864 to 1885). Since the Board reported on all matters dealing with agriculture, it is apparent that no severe outbreaks of insects occurred during this period. Losses from insects in those earlier years must simply have been accepted as unavoidable and natural.

The first instruction in Entomology was given in 1885, when Professor H. W. Smith was appointed lecturer in Agriculture at the Provincial Normal School in Truro. In 1888, a farm to be operated in connection with the school of Agriculture was purchased at the site where the NSAC is now located. In a report of the activities of the school for that year, Professor Smith specifically mentions entomology as one of the courses being taught, "Entomology is taught without any apparatus whatever to use: This is an important branch in this Province. A little assistance here would be a great help." In that year, twelve students were registered at the school.

In his 1892 report, Professor Smith made the following recommendations:

> "There is need for a good entomologist for the province, who would devote his time and energy to the fruit growers and farmers of the province. If employed as Prof. of Entomology in the Provincial School, he could visit local schools, conduct experiments and show farmers how to combat their numerous insect enemies."

However, it is worthy of mention that this recommendation was not acted on till 20 years later.

Smith reported on the prevalence and life histories of the cabbage maggot, wheat midge and wireworms in 1892, and two years later the Nova Scotia Secretary for Agriculture reported on the finding of scale insects attacking plums, peaches and gooseberries.

A course in economic entomology constituted part of the prescribed studies in the N.S. School of Horticulture, established at Wolfville in 1893. The Wolfville School of Horticulture, operated by a Board appointed by the N.S. Fruit Growers Association, was discontinued in 1904 and the work transferred to the College of Agriculture, Truro.

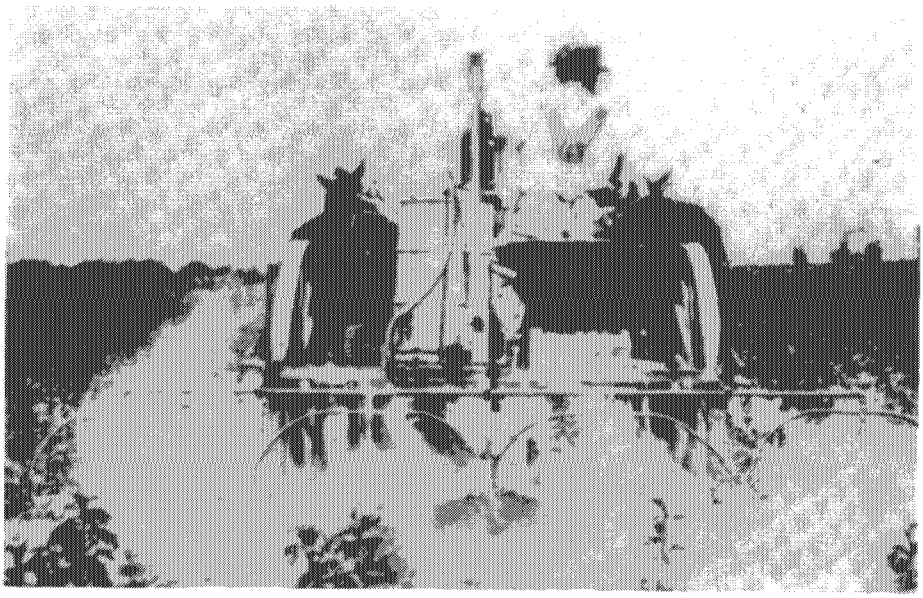
This was not the only activity of the Nova Scotia Fruit Growers Association. Organized in 1883, the Association provided a main source for distribution of information on insect control to growers. A trained entomologist was invited to speak to the fruit growers and in 1886 the address was given by Dr. James Fletcher, who was then Dominion Entomologist. This proved to be the beginning of a mutual liaison between farmers' experience and the research of plant pathologists, entomologists and chemists. Fletcher emphasized to growers *firstly*, the importance of using measures based on knowledge of the life history and habits of pests; *secondly*, knowing how to recognize them; *thirdly*, being aware of the best spray materials; *fourthly*, selecting sprays on the basis of feeding habits; *fifthly*, finding ways to make the poisons safe to use; and *sixthly*, having some idea of the role of parasitism, etc. We could not improve on this advice today.

Fletcher as Dominion Entomologist from 1884 to 1908 laid the foundation for entomology in Canada. He organized the Insect Intelligence Service, with 400 observers across Canada who reported periodically on noxious insects and remedies for their control. Thomas Nathanial Willing, the subject of Dr. Riegert's Heritage Lecture last year, was one such observer. Fletcher had many observers in the Maritime Provinces.

The report of the Director of the School of Horticulture for 1900 includes the results of experiments on the control of the forest ten caterpillar on apples by the use of Paris green. The report of the Principal of the School of Agriculture, Truro, for the same year announced the erection of a new building with special laboratories for the study of science subjects, including entomology.

The threat posed by the brown-tail moth, *Nygmia phaerrohoea* Don., led to increased activity in economic entomology during the early part of this century. Although the first brown-tail adult moth had been taken at Digby in 1905, this find was not noted at the time and it was not until April 1907 that the presence of this insect was first called to the attention of the authorities. For the decade following the brown-tail moth's appearance, extensive reports were given each year on this pest. Initially, control work was undertaken by provincial authorities, but they were soon joined by officers of the Dominion Entomological and Fruit Branches and the work of eradication was carried out on a co-operative basis. At first a bounty was paid for the winter nests but this was later substituted by spraying in infested areas and the gathering of winter nests by government officers. It may be of interest to note that although as many as 24,156 nests were taken in the winter of 1913-14, the numbers gradually decreased until the winter of 1926-27, which was the last year in which winter nests were taken.

In 1911 the *Injurious Insect Pest and Plant Disease Act* was passed by the N.S. Provincial Legislature and in July of the same year Regulations declared the following insects subject to the Act: San Jose scale, brown tail moth, gypsy moth and woolly aphids. In his report the same



Spraying potatoes for Colorado beetle control with one of the earliest potato sprayers, about 1919.

year, the Secretary of Agriculture urged the establishment of a laboratory by the Dominion Department of Agriculture in the Annapolis Valley for the study of the brown tail moth and other insects.

In October 1912, Dr. Robert Matheson was appointed Provincial Entomologist and Professor of Zoology at NSAC, Truro. It is believed this was the first provincial entomologist to be appointed in any province of Canada. Matheson resigned as provincial entomologist in October 1913 and was succeeded by W. H. Brittain who was to remain in Nova Scotia till 1929. Two important discoveries were made in 1912 and 1913, the San Jose scale being discovered in Nursery Stock in 1912, followed by the first official record of the apple maggot in 1913. Under the energetic direction of W.H. Brittain, investigations on the control of these and many important insect pests, including apple sucker and the green apple bug, were undertaken. Brittain became internationally famous for his pioneer studies on the cabbage maggot and on apple pollination.

There was little change in the manner in which the entomological work was carried on until 1926. In that year, Dr. Brittain severed his connection with the College of Agriculture and became Professor of Entomology at Macdonald College, McGill University. However, he continued to hold the position of Provincial Entomologist for a further three years, spending the summers in a study of fruit insects of the Annapolis Valley.

Another leading entomologist in Nova Scotia was Arthur Kelsall, who for many years was the dominant spirit behind the control of orchard insects in the Annapolis Valley.

In 1939, Kelsall became Superintendent of the Kentville Experimental Station and A. D. Pickett went to Annapolis Royal.

Another well known Entomologist was Allan Gordon Dustan. Born at Halifax, 1892, Dustan was educated at NSAC, OAC and Macdonald College. He was to serve for ten years in both Nova Scotia and New Brunswick before transferring to Ottawa in 1925 in charge of truck crop insect investigations. In 1915, he began his 37 years with the Entomology Division of CDA, then the Entomological Branch. He was appointed Assistant Field Officer at the Annapolis Royal Laboratory, under Mr. G.E. Sanders, and worked on orchard insects, particularly fruitworms and bud moths.

In 1928, Mr. A. D. Pickett was appointed Assistant Provincial Entomologist, and in 1929 he was appointed Provincial Entomologist following Dr. Brittain's resignation from that position. During the following decade, entomological work concerned itself with the establishment of a comprehensive spray service involving practically the whole of the fruit growing areas of the Annapolis Valley. In 1938, there were over one thousand fruit growers taking advantage of this service.

Entomology in New Brunswick

The Natural History Society of New Brunswick was organized in 1862, but most members were geologists and ornithologists. It was not until about 1884 that the first collection of insects was presented to the Society by Mr. H. E. Goold, who can be considered the pioneer entomologist of New Brunswick. A few years later, a Mrs. C. E. Houstis made a collection of insects near St. John and presented it to the Museum. About 1895 Wm. McIntosh began making a general collection of insects of New Brunswick and by 1918 it numbered about 19,500 specimens. The University of New Brunswick at Fredericton purchased the Preston collection which consisted of ten trays containing Coleoptera, Lepidoptera and Odonata, both native and exotic. The Dominion Entomology Laboratory at Fredericton, established in 1912, had a collection of Diptera in which the New Brunswick forms were well represented.

Many of the early leaders in Entomology in Nova Scotia and New Brunswick came from the Motherland and among these was John D. Tothill. He was born in London in 1888 and came to Canada as a young man to study at the Ontario Agricultural College where he specialized in entomology and botany.

Although Tothill's researches laid the foundation for biological control of insects and plant pests in Canada and also led to the establishment of the Forest Biology Laboratory in Fredericton, he was in the Atlantic Region for only 10 years, from 1912 to 1922. In 1911, he had been selected by the Dominion Entomologist, Dr. C. Gordon Hewitt, to direct the introduction of parasites of the gypsy and brown-tail moths into Canada, and was appointed a field officer of the Division of Entomology with headquarters at Fredericton, New Brunswick.

J. D. Tothill organized and directed the brown-tail moth survey and eradication program in New Brunswick, which was taken over by Dr. L. S. McLaine in the fall of 1913. In the spring of 1912, Tothill set up the first entomological laboratory in New Brunswick, on the campus of the University in a two-room wooden structure 6 × 15 ft.; this served as the centre for Natural Control Investigations, of which he was head, until a larger permanent brick laboratory was constructed under his direction in 1915-16.

J. D. Tothill was an exceedingly keen researcher and most inspiring and helpful to the staff under his direction. His work was always well organized and he was meticulous in making observations and recording data, a habit for which he gave credit to the Comstocks and Needhams, under whom he had studied at Cornell.

During the ten year period 1912-22, he organized and directed intensive research on natural control of the fall webworm, tent caterpillars, the spruce budworm and several other insect pests. He published a complete account of his work on the natural control of the fall webworm in Canada, but much of the wealth of information obtained during this ten year period remains in notes and unpublished reports. Throughout this period he continued research in taxonomy of Diptera and described a number of new species of parasites.

First entomology laboratory, a two room structure measuring 6 × 15 ft., established on the campus of the University of New Brunswick, Fredericton, by Dr. J. D. Tothill, 1912.

His studies on the spruce budworm, of which only reviews were published, and knowledge gained from an extensive survey of the damage caused to New Brunswick forests led to his efforts to develop official and public interest in planned management of the forests with biological control of pest insects as an integral part. This interest in biological control had been stimulated by his earlier researches on dipterous parasites of the Gypsy Moth and was to lead to the publication of his classic *The Coca Nut Moth in Fiji*, which followed from his secondment to Fiji in 1924 from Ottawa. From 1926 he was to work ouside Canada, mostly in Africa before retiring to Scotland in 1953.

Another outstanding New Brunswick entomologist was Raymond Paddock Gorham. A born naturalist from Gorham's Bluff, near Kingston, N.B., in 1885, Gorham received his B.Sc. at Macdonald College, McGill University, in 1911. During employment with the New Brunswick Department of Agriculture, in 1911-12, he co-operated with the Federal Entomology Service on the campaign to eradicate the brown-tail moth. During 1913-18, he was horticulturist at the Dominion Experimental Station, Fredericton, and assisted in planting the first arboretum there, (remnants of which still exist). After a short period at the University of Maine as a horticulturist, and as a Natural Science Teacher at the Provincial Normal School, Fredericton, N.B. he joined the Entomology Branch in 1919 to work on the spruce budworm study team at Nictau, N.B. Interestingly enough, his notes of that time comment on the hazards of *"unbalance associated with chemical control of forest pests."* Leaving N.B. in 1921, he joined the staff at Annapolis Royal, N.S. where he participated in the brown-tail moth work and fruit insect and insecticide studies for the next three years. Returning to N.B. as Officer-in-Charge of the field crop and garden insect section of the Dominion Entomological Laboratory at Fredericton in 1925, he remained there until his sudden death in 1946. He initiated agricultural entomology in New Brunswick, beginning the potato insect investigations that laid the groundwork for later studies on virus vectors in N.B. He also served as an extension entomologist when there was none on the Provincial Staff.

Gorham had a very great variety of interests, ranging from a fascinating fund of knowledge of Maritime history, especially agriculture, to almost an encyclopedic appreciation of animal and plant life of N.B. in particular. He was a prolific writer and a list of his manuscripts, published and unpublished contains 281 titles. He was a collector of plants and animals (including insects), Indian relics, and early editions. His intense interest in such a wide range of subjects often led to feelings of frustration and depression. In his lighter moments, he was a fascinating companion and story teller. In his death, at age 61 years, Canada lost another of the rapidly vanishing race of observant naturalists.

Following the death of Gorham in 1946, Jean Adams headed up the Field Crop Entomology Laboratory with a team of researchers that included: Ellen MacGillivray, Pond, Bradley and Dione. Adams studied aphid transmission of mosaics and leaf roll of potatoes and their impact on potato breeding and seed production. At the same laboratory, Charlie Maxwell and George Wood made significant contributions to our knowledge of insects of the lowbush blueberry crop and tree fruits.

Alfred Briggs Baird, a pioneer entomologist and an earnest architect of biological control in Canada, was born at Lake Stream, N.B. on October 11, 1891. A graduate of NSAC, OAC and Cornell, A.B. Baird began his career in 1911 as a seasonal assistant to Mr. G. Sanders on the brown-tail moth survey and in the following year (1912) he worked under Dr. J.D. Tothill in the newly established entomology laboratory at Fredericton.

After graduation from OAC in 1916 he was appointed field officer at Fredericton, where he continued working with Dr. Tothill on parasite introduction and the natural control of native pest insects. In 1918 he was transferred to Agassiz, B.C., where he did extensive research on natural control of the spruce budworm, the fall webworm, tent caterpillars, and the oak looper, all under rather primitive conditions and often with harrowing experiences. On his first trip to the budworm-infested area at Lillooet, B.C., he was mistaken for a revenue officer and for protection had to spend a night hidden behind the counter of the general store.

In 1921, after attending Cornell University, Dr. Baird returned to Fredericton where he studied parasites of the larch sawfly and the larch case-bearer, preparatory to the introduction of natural enemies from England. Leaving Fredericton in 1929, Baird became Officer-in-Charge of the new permanent laboratory for biological control work at Belleville, Ontario, and in 1948 transferred to Ottawa as Head of Biological Control, where he remained until retirement in 1956.

As a pioneer, and as a leader for over 40 years in the biological method of insect control in Canada, Dr. Baird never lost sight of the applied interests of his profession and to this end he maintained and greatly extended the work started by Dr. Tothill.

Entomology in Prince Edward Island

Between 1911 and 1919, entomology laboratories had been established in all provinces except Prince Edward Island. For years, entomology work in P.E.I. was the responsibility of R. P. Gorham of the Fredericton Laboratory and A. Kelsall of the Annapolis Royal Laboratory. However, since they had a full roster of duties in their own provinces they were not able to spend a great deal of time in studying insect problems on Prince Edward Island.

The year 1937 was a key year on the national as well as the local level. In that year, the Federal Department of Agriculture underwent the first of many major reorganizations, and Prince Edward Island was deemed by the Department to be in serious need of an entomology research unit.

Fred M. Cannon, a Prince Edward Islander who was studying medicine at Dalhousie University, and had spent his summers working as a potato inspector for the Seed Inspection Unit, was asked by the Science Service to consider studying entomology at Macdonald College to prepare for a career with the proposed unit at Charlottetown. Cannon accepted this offer, completed his B.Sc. at Macdonald in 1937, and obtained his M.Sc., in entomology in 1939. He was enlisted to organize the P.E.I. Division of Entomology in 1937 and remained there until his retirement in 1970.

Cannon surveyed the province to determine which pests posed the most serious threat to island agriculture. He conducted research into the control of the strawberry weevil, a particularly active fruit pest at that time. Screening a number of chemicals to control the pest, he finally demonstrated cryolite dust was the most effective product available. Soon, the chemical came into wide usage for this purpose in P.E.I. and Nova Scotia. Cannon also investigated the barley jointworm, potato insects, and root maggots, among other insect problems. He was often called upon to advise farmers on insect control, and this was an especially important service because at that time there was no one in the province's Department of Agriculture to answer such questions. Unfortunately, the old Science Service Building, which housed the Staff of Entomology and Plant Pathology as well as the insect collection, burned to the ground and the valuable collection of insects was lost.

Other Major Contributors

Mention was made earlier of the first Dominion Entomologist, James Fletcher, who held this position from 1884 to 1908, and who had a considerable impact on entomology in the Atlantic Region. Much of the expansion of the economic entomology services took place during the tenure of Charles Gordon Hewitt who served as Dominion Entomologist from 1908 to 1920. In this short period he developed the Canadian entomological service from a small division, attached to the Experimental Farms Branch, to an important separate branch of the Department of Agriculture. Through his initiative, the divisions of Field Crop and Garden Insects, Forest Insects, Foreign Pests Suppression, and Systematic Entomology were formed. He also established field laboratories at Annapolis Royal, N.S., Fredericton,

The old entomology laboratory, established in 1915, at Annapolis Royal, Nova Scotia. One of the first centres of insect studies in Atlantic Canada.

N.B. and in all other provinces across Canada. Dr. Hewitt was well endowed with character, foresight, ability and drive. He was a lucid speaker and writer and his charming personality and thoughtfulness endeared him to his officers and friends.

Tribute should also be paid to two other notable contributors to entomology in Atlantic Canada, Drs. A. D. Pickett and R. A. Balch. Pickett, following Brittain in 1929 as Provincial Entomologist for Nova Scotia, was an outstanding extensionist, teacher, researcher, director of research, and above all an early promotor of modern pest management systems. Pickett organized a team approach to orchard pest problems with researchers Patterson, MacPhee, Herbert, Lord, Butler, MacLellan, Sanford, Specht, Neilson and Chisholm.

R. E. Balch not only administered the Forest Entomology and Pathology Laboratory at Fredericton, N.B., for thirty years (1930-60), but had a distinguished scientific career. The strength of this Research Centre must be credited to Dr. Balch's sound judgment in recruiting young scientists, and to his innate ability to start a research program at precisely the right time, e.g. the Green River project with such notables as Morris, Miller, Watt, Wellington, Holling, Stehr and O'Brien.

Maine State University

Working as our neighbour to the South, I must mention two scientists at the University of Maine, Edith M. Patch and G.W. Simpson, both leading aphidologists whose work impacted upon Maritime Agriculture. Edith Patch, who started work at the University of Maine in 1905, was a prolific writer with 80 scientific papers, 40 popular articles on science and entomology, 100 works for juveniles on nature and insects, and 15 books. G.W. Simpson, a distinguished teacher, researcher and administrator, worked on aphids and their relation to the field transmission of potato viruses in N.E. Maine.

Acadian Entomological Society

No lecture on entomology in Atlantic Canada would be complete without a mention, however brief, of the Acadian Entomological Society—our host for this year's meeting.

Sixty-nine years ago, on August 3, 1915, a meeting was held at 2:00 p.m. in the Assembly Hall of the Normal College at Truro, N.S., to organize a society to be known as the Nova Scotia Entomological Society. It would constitute a branch of the then Ontario Entomological Society. The aims and purposes of the society were set before those present by Dr. W.H. Brittain, and a number of papers were also presented. Before the meeting closed, an election of officers took place. In 1920, Arthur Kelsall, then Secretary-Treasurer of the Society, had visions of a rapidly expanding group. In 1921, the name of the Society was changed to the Acadian Entomological Society and the first meeting outside of Nova Scotia was held at St. John, New Brunswick. With the reorganization of the ESC in 1950, AES was expanded to include all persons interested in entomology in Atlantic Canada and the state of Maine. Early history and development of the AES is fully described by Jean B. Adams (1965) in an article entitled: "Golden Anniversary, Acadian Entomological Society."

So started what is today the Acadian Entomological Society. This year's meeting also forms part of the Province of New Brunswick's Bicentennial Celebrations of 1984. ESC is pleased to help New Brunswickers celebrate this historical event, with the theme for this meeting "Entomological Perspective in Resource Management." I welcome the opportunity that this heritage lecture has given me to reflect back on the birth of Atlantic entomology, to a time when our developing provinces faced the problems of introduced insects without the professional skills and the chemical resources we now have available.

Acknowledgements

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STUDENT COMPETITIONS

Joint Meeting Acadian Entomological Society — Entomological Society of Canada, St. Andrews By-the-Sea, N.B., 1984

The winner of the $200 prize for the best student paper was Wade W. Bowers, Department of Biological Sciences, Simon Fraser University. His paper was entitled "Bionomics and ecology of the four-eyed spruce bark beetle, *Polygraphus rufipennis* (Kirby) (Coleoptera: Scolytidae), in Newfoundland". Mr. Bowers, who comes from Newfoundland, found a close relationship between beetle attack and spruce budworm defoliation. The species overwinters as callow adults which produce two broods. An aggregation pheromone, produced by male beetles, was indicated.

Competition was very close, and it was a unanimous decision of the judges to award Honorable Mention to two other competitors, Connie J. Isaacs, University of New Hampshire, for her paper "Anti-mosquito behaviour in the white-footed mouse", and Kees van Frankenhuyzen, Simon Fraser University, for his paper "Freshwater acidification: effects of low pH on transformation of detrital energy by a shredding caddisfly".

Seven judges were selected by Competiton Coordinator Lucy J. Dyer (University of New Brunswick):

J. H. Kelleher, Agriculture Canada, Ottawa,
J. A. McLean, University of British Columbia,
A. G. Raske, Canadian Forestry Service, St. John's, Nfld.,
P. W. Riegert, University of Regina,
R. H. Storch, University of Maine, Orono,
R. Y. Zacharuk, University of Regina,
D.C. Eidt (Chief Judge), Canadian Forestry Service, Fredericton.

There were 20 papers in the competition. Papers by L. A. Gilkeson, D. Lee, and W. L. Fairchild and D. J. Lewis were withdrawn from the program, and papers by W. E. Ralley and T. D. Galloway, D. R. Miller, J. Roland, and H. Chaisson, not so indicated in the program, were entered. The judges found the quality of the students' papers high, decidedly higher on average than those of their seniors.

The original design of the competition was to value scientific content at 50 points broken down as follows:

20 - originality of hypothesis and thoroughness of research
10 - experimental procedure
10 - analysis of data
10 - validity of conclusions

Presentation was valued at 50 points broken down as follows:

20 - overall organization—explanation of problem, method and results, discussion, summary.
10 - verbal clarity
10 - quality of visual aids
10 - ability to answer questions

Future organizers of student competitions should be aware of the difficulties we had with these apparently straightforward criteria. The first paper heard was a descriptive review and it did not fit the criteria for scientific content. It had neither a working hypothesis nor conclusions, yet it was an excellent contribution to science. Some student papers in the competition had a second author which led us to wonder if the hypothesis, experimental procedure, analysis and interpretation were entirely those of the student. The judges simply had to ignore the problem because they could not ask each student; as it turned out, the three top papers were not coauthored. Finally, not all speakers were asked questions, therefore it was impossible to evaluate their responses and value was derived from the points awarded out of the other 90.

The initial plan was to establish points for each paper, then eliminate the highest and lowest marks and average the remaining five (or fewer if a judge or two should miss a paper). This scoring technique is used in competition diving and other sports to eliminate bias of chauvinistic or antagonistic judges. All went well until we found that the judges seemed to centre their marks around different places on the scale, and the spreads differed. To average such marks would give greater weight to some judges than to others. All judges had heard all papers, therefore we used a non-parametric system whereby each judge ranked the top seven papers. A table was drawn up and the person with the best total score

was declared the winner. Two others scored very close to the winner, hence the decision to award Honorable Mentions.

In future competitions, the organizers may profit from our experience. Entrants might be asked at the time of application for entry to declare the extent to which the hypothesis, techniques, analysis, and interpretation are their own. One cannot oblige people to ask questions, but points might be forfeited by competitors who do not allow time for one or two questions.

We enjoyed judging this competition because the papers were excellent. We felt a little silly at times when we herded from one lecture room to another. It was worth it, but don't ask us to do it again, at least not soon.

D. C. Eidt
Canadian Forestry Service
Fredericton, N.B.

REPORTS FROM OFFICERS, TRUSTEES, AND COMMITTEES

Annual Report of the Secretary for 1984

During the past year I have prepared agendas for and recorded minutes of the Annual General Meeting and the meetings of the Governing Board and Executive Council. I have prepared ballots for the election and notified nominees of the election results. In addition, I have maintained the Society's files; distributed minutes, reports, scholarship forms and other information as required; prepared notices of meetings and of Society affairs for the Bulletin; and provided liaison between the committees of the Society and the Governing Board, as well as between the Society and the Affiliate Societies.

I am grateful to the Executive Council, Directors and Trustees for their help and advice during the past year. Without this assistance and co-operation I could not have carried out the duties of the Secretary.

Since I will be stepping down as Secretary at the end of 1984, I take this opportunity to thank everyone who has helped me during the past three years. I have greatly enjoyed serving the Society.

H. G. Wylie

Report of the Finance Committe for 1984

Members of the Finance Committee (FC) are: D. Barnes, E. C. Becker, H. V. Danks, J. R. McLean, A. C. Schmidt, B. J. R. Philogène. The Committee met in Ottawa on March 8 and July 25, 1984. The following reports and recommendations were presented to the Executive and Governing Board.

(1) A microcomputer system was carefully selected and has been acquired for the ESC office. This system is able to maintain address lists, generate mailing labels, etc., and to keep the Society's accounts in a suitable format.

(2) The FC continues to monitor the potential benefits of direct use of discs by the printer for manuscripts prepared on word-processors.

Early tests of the procedure have experienced difficulties caused by particular typed characters, but a better evaluation will be possible when manuscripts stored on discs prepared by a different system are available in the near future.

(3) The FC recommended that ESC Bulletins should be mailed on arrival at the ESC office unless they can be sent with the *Canadian Entomologist* within a few days.

(4) The FC recommended that capital and current accounts should not be separated in an accounting sense, but interest earned on capital funds should be clearly identified in future audit statements.

(5) The FC recommended that expenses for persons attending Governing Board meetings should be actual expenses up to a maximum of the prevailing "Government Rate", and that the Secretary should urge members of the Board to make all possible savings when attending meetings.

(6) The FC recommended that Society members be notified on the annual dues notice, and via the Bulletin, of the possibility of donating journals received through subscription.

(7) The FC recommended that the Treasurer establish a file in the Society's office containing the information that would be required in an emergency by any individual authorized by the Executive to act as Treasurer in the event that the Treasurer was incapacitated for a period.

(8) The FC concluded that separation of subscription to the Canadian Entomologist and the membership dues/Bulletin is impossible on financial grounds.

(9) The budget for 1985 (reviewed by the FC and recommended to the Board) shows a small surplus. This is appropriate as an increase in fees only recently became effective after two years with a deficit. The FC noted the relatively high cost of the Bulletin, while recognizing its importance to the Society, and suggested further enquiries be made to ascertain if the Bulletin can be made more attractive or less costly. The FC also urged that the amounts of interest transferred to the Capital Fund continue to fully compensate for the decreasing buying power of fixed investments.

(10) The FC reviewed financial implications of the possibility that the Society could provide bridge-funding for a contract with Agriculture Canada on the economics of insect control in wheat, canola, and corn. This could be conducted for 18 months from late 1984, but funded only over a 3 year period commencing in April 1985. The FC recommended that this possibility be pursued, and they prepared detailed recommendations for the Board as to what sorts of arrangements for bridge funding should be acceptable.

They further recommended that reports from ESC contract work be more actively distributed or advertised.

(11) The FC recommended that support for the (retiring) Managing Editor to attend the Annual Meeting in St. Andrews be provided by the Society.

H.V. Danks (Chairman)

Report of the Scientific Editor for 1984

The scientific editorial duties for *The Canadian Entomologist* are now being run entirely from Waterloo. Doug Eidt sent me, in June, the last old but still-active files for which he had been responsible. The transition of editorial offices seems to me to have proceeded very smoothly, with only a few manuscripts and authors disturbed by the inevitable delays and confusion that accompanied the switch.

The status of manuscripts under my supervision (*not* including open files that were active under Eidt and for which I now have responsibility) is as follows (as of 8 August 1984):

Status of Manuscript	*Number*	*Proportion (%)*[1]
Accepted "as is"	1	3.2
Decision deferred, pending revision	3	2.4
Acceptable, with major revision	42	33.9
Acceptable, with minor revision	49	39.5
Rejected	26	21.0
SUBTOTAL	124	
In review	35	
TOTAL	159	

[1]Based on manuscripts for which a decision has been made.

Stephen M. Smith

Publications Committee Report for 1984

Members of the Publication Committee are: P. Benoit, C. Cloutier, C. Dondale, R. Downer, T. Galloway, M. MacKauar, R. Lamb.

Changes in Editorial Staff for the Canadian Entomologist

Following the resignation of D. Eidt and C. Miller after many years of service, S. Smith and R. Downer were appointed as Scientific Editor and Assistant Editor respectively. M. McBride has submitted her resignation after over 17 years as Managing Editor for the Society. The President has named a search committee consisting of M. Campbell, E. Becker and S.M. Smith to identify potential replacements.

Waiver of Page Charges for the Canadian Entomologist

Partial waivers of page charges were granted for three manuscripts consisting of a total of 13 pages. One application was rejected.

Book Reviews

Since the last report, 10 book reviews and 19 book notices were prepared for publication in the Bulletin.

Promotion of ESC Publications

T. Galloway arranged to have an advertisement for Arctic Arthropods placed in the Bulletin of the Entomological Society of America and is pursuing other advertising possibilities. The ad will be reprinted in the ESC Bulletin when space permits. Sales continue to be disappointing.

Society Address on Publications

On the request of the Executive Council, the Chairman confirmed with M. McBride that the Society's address and telephone number appear on all ESC publications.

Publication of Reviews and Letters in the Canadian Entomologist

At the request of the Scientific Editor, the Committee considered the advisability of publishing reviews and letters in the Canadian Entomologist. The Committee recommended that letters on matters arising be published in the Bulletin. One member opposed the publication of reviews but the other members were in favour providing the reviews are of very high quality.

R. J. Lamb (Chairman)

Report of the Bulletin Editor for 1984

Since the Annual Meeting in Regina last year, four issues of the Bulletin have been produced. Although many of the submissions received for them dealt with Society affairs such as meetings, appointments and awards, and were received from the President and Secretary, articles and notes of interest to entomologists were published also. These articles were either solicited by the Editor, viz. Guest Editorials, or else the initiative came from Committees and members of the Society themselves. As Editor, I am encouraged by the Membership's appreciation of the Bulletin's role in disseminating information, and welcome contributions of interest to entomologists.

Concern over late delivery of the Bulletin has been expressed. Over the past year, between 14 and 30 days have elapsed from the time that the Bulletin has left the printer for Ottawa, and has been delivered to a member of the Society in Alberta. In an effort to expedite delivery, the Finance Committee made the recommendation at the mid-term Executive Council meeting that the Bulletin not be held up for "more than a few days" on reaching Ottawa. All efforts to shorten delivery time will be appreciated.

The Editor welcomes all suggestions for improving the Bulletin.

H. J. Liu

Report of the Annual Meeting Committee for 1984

Preliminary information including a proposed theme, plenary session, and symposia about the meeting to be held in St. Andrews, N.B., was distributed at the 1983 meeting in Regina. The announcements of the meeting were made in the March and June issues of the Bulletin (16(1): 9 and (2): 42-45 and 47). The June announcement included a tentative program listing the symposia and workshops (short courses), a questionnaire, and a call for papers. These announcements and New Brunswick travel information was sent to all members early in the summer.

The number of submitted papers from professional entomologists was lower than expected. It is encouraging, however, that over 20 papers were submitted for the student competition.

Arrangements at the Algonquin Hotel were finalized. Members of the Local Arrangements Committee visited the hotel several times to become familiar with the physical set up and area. The Local Arrangements Committee had a meeting Friday, 28 September, to make certain that everything was ready.

The final financial situation will not be known until registration is completed. The committee feels that if the ESC wishes to have a wide range of quality symposia which would attract entomologists from the United States and other foreign countries, then the Society will have to give more support than is presently provided. It is suggested that the ESC Governing Board discuss this matter.

I thank Dr. Gilles Boiteau and Dr. I.W. Varty (Co-chairman) and the persons who have worked with them for arranging what I know will be an outstanding meeting.

Respectfully submitted,
R. H. Storch

Report of the Annual Meeting Committee for 1985

Planning for the 1985 Annual Meeting of the Entomological Society of Canada is progressing on schedule. Details of the meeting are as follows:

Meeting Place	— Skyline Hotel, Ottawa, Ontario
Dates	— September 23-25, 1985
Theme	— Entomology on the Northern Horizon

The program will include a Feature Symposium entitled "Entomology on the Northern Horizon" with emphasis on agriculture in the north and two additional symposia: "The status of research and the potential for use of microbial control in Canada" and "Biosystematic problems in northern entomology". Other features on the program will include a Heritage Lecture, President's Prize (Student Competition), submitted papers, meetings of special interest groups (if requested), poster session, and Gold Medal Address.

The Program Committee Chairperson is Dr. A. Hudson; the Local Arrangements Chairperson is Dr. P. Dang.

D.E. Bright
General Chairman

Science Policy Committee Report for 1984

The Science Policy Committee held its Annual Meeting at the Embassy West Motor Hotel, Ottawa, on April 23, 1984. Current projects and related activities were reviewed and contacts with other organizations were considered. In addition possible new initiatives were discussed.

To evaluate the impact of the report, *Entomological Education in Canadian Universities During the 1981-82 Academic Year* (June 1983 Bulletin), letters containing specific questions were sent to the Chairmen of all university departments who participated in the original study.

A decision was made not to distribute the report on the *Need for Continuing Support of Entomology in Renewable Natural Resources by the Federal Government*. The reasons that prompted the initiation of this study were considered to be no longer valid.

Owing to some overlap of interests and possibility of duplicating endeavors, contact was made with the Agricultural Institute of Canada exploring potential for its cooperation with the Science Policy Committee. It was decided that exchange of minutes of the annual SPC meeting and the Executive Meeting of AIC would achieve the desired level of information exchange. A. O. Terauds, General Manager, AIC, responded favorably to this idea.

A progress report was submitted by the sub-committee on *Microbial Insecticides: Their registration and use in agriculture, and public and animal health*. The first draft of the report is anticipated by October 1984.

Reports were received from Society representatives to BCC (D.E. Bright) and AASC (S.B. Hill). Stuart Hill spoke at the 1984 Annual General Meeting of ESC about the organization and objectives of AASC.

A letter was sent to Donald Johnston, Minister, MOSST thanking him for his detailed and informative letter to R.F. Morris about the increase of Gross Expenditures on R & D (GERD) to 1.5% GNP by 1985 and congratulating him on progress to date. Inquiry was made as to whether he was still as optimistic about reaching the 1.5% level by 1985 as he had been a year earlier.

A letter concerning contracting out of research by Canada Agriculture was sent to the Task Force to Review Federal Policies and Programs for Technology and Development that was established by Donald Johnston, Minister, MOSST, and chared by Douglas Wright, Presi-President, University of Waterloo. The letter was prepared subsequent to a personal visit to President Wright, discussed areas of concern and contained suggestions for improvement.

The *Dossier of Important Entomological Subjects in Need of Research in Canada* and *List of Neglected areas of Research in Entomology* were reviewed and updated. A request soliciting ideas from the membership was published in the June Bulletin. Progress to date on proposed subjects in the dossier was discussed as was the list of proposed titles of neglected areas of research. Additional subjects were requested from the members in order to keep the Board well informed which is crucial for it to be able to act effectively on behalf of entomology and entomologists in Canada.

A letter was sent to Stuart Smith, Chairman of Science Council, expressing support for his desire to establish a Centre for Science Policy at a Canadian university and to draw to his attention the activities and achievements of the SPC of ESC as well as the resource of experienced personnel within the Society.

New initiatives of the Science Policy Committee will be considered at the next annual meeting. Implementation of any new initiatives will depend on present ones having reached a satisfactory stage of completion.

Susan B. McIver (Chair)

AASC Annual Report for 1984

On 11 May 1984 at the first Annual General Meeting of the Association for the Advancement of Science in Canada, Dr. John Adair, out-going President of the Association, issued its first Annual Report and introduced the incoming President, Dr. N. Jack B. Wiggins, and the 12 new Councillors.

AASC's primary mission is to foster greater public awareness of the significance and social impacts of science and technology in Canada. It is a membership association and came into existence in November 1982 with the dissolution of SCITEC (Association of the Scientific and Technological Community of Canada).

AASC has doubled its individual membership during the first year (350 by May 1984) and aims to attract 1,000 members by the spring of 1985 and 5,000 by 1988. The plan is to achieve this by attracting scientists and non-scientists to local chapters within cities or regions throughout the country. The first one was established in the National Capital Region in May 1984, and it is hoped that others will soon be formed in Halifax, Montréal, Edmonton and Victoria. In addition to individual members, AASC also has 31 Society Members (referred to as Corporate Members).

During its first year of operation AASC has assembled a first-class secretariat with Dr. Jeffrey Crelinsten as Executive Director, Mr. Ted Thaler as Project Office and Mr. Azim Mohamed as reporter for AASC's bi-monthly publication, ACCESS. Aimed at scientists and non-scientists, each issue of ACCESS contains four or five articles addressing a specific theme, a feature interview with a prominent Canadian scientist, and a special report, in addition to its regular sections (Media Watch, AASC News, Research Report, Future, Conferences, COPSE, R & D Update, Academics, and Correspondence). In May 1984 it had a circulation of 800.

AASC recently received a grant of $55,000. from MOSST (Ministry of State for Science & Technology) under their Public Awareness Program. This, and the fact that they have relocated to rent free quarters in the National Museum of Science & Technology, will enable them to increase their efforts to attract members.

AASC administers CIDA funds in connection with their contribution to Interciencia, a Federation of Associations for the Advancement of Science in the Americas.

AASC also has executive responsibility for administering COPSE (the Committee of Parliamentarians, Scientists and Engineers), which is committed to building a bridge of understanding between these three communities. During the 1983-84 period it held four luncheons for Members of Parliament featuring speakers on the following topics:

- The impact of Science and Technology on Canadian Society (Dr. Fraser Mustard)
- Energy Future (Mr. Barry Welford)
- University/Industry Cooperation in Research (Dr. Douglas Wright)
- Agriculture and Science in Canada (Dr. Clay Switzer)

Transcripts of luncheon addresses appear subsequently in ACCESS, and reprints are available from AASC.

AASC is anxious to collaborate with Member Societies in organizing two types of events at Annual Meetings: a) public events aimed at bringing the social impacts of science and technology into public discussion, where specialists and the public can interact in a non-confrontational atmosphere, and b) sessions to sensitize professionals to issues related to their own field and to foster multidisciplinary approaches to specific problems. These are two areas where ESC might consider collaborating with AASC. Also, "the role of entomology in Canada's development" or some other entomological topic could be proposed as a feature article for a future issue of ACCESS.

Members of ESC are encouraged to join AASC as individual members ($25.00/yr or $10.00 for students) and to contact the secretariat to make suggestions or find out how they can help AASC achieve its mission, both nationally and in their particular region (write or phone AASC National Office, 2380 Lancaster Rd., Ottawa, Ontario. K1B 3W9 — Telephone 613-521-2556).

Respectfully submitted,
Stuart B. Hill,
ESC Observer to AASC.

Report of the Representative to the Biological Council of Canada for 1984

During the past year the BCC/CCB has been involved in a number of activities. Following is a summary of the highlights.

G.B. Wiggins prepared *A Statement on Hiring Policy for Scientists in the Federal Government*. The main thrust was that the best person for the job should be hired. This document has generated a good response, including a considerable correspondence.

Support for the establishment within NSERC of an Advisory Committee on the Life Sciences is an ongoing campaign of BCC. Ray Morris wrote a letter to Janet Halliwell, Director of Grants, NSERC, expressing support of the ESC.

John Phillips, Department of Zoology, University of British Columbia was appointed to the Council of NSERC. The Council is composed of about 25 members from universities, industry and the administration of NSERC. The appointment of Dr. Phillips is of special significance because he is only the second biologist. Ray Morris wrote to Donald Johnston, Minister of MOSST commending him on the appointment of Dr. Phillips.

The Science Council of Canada has recently published a review of the forestry situation in Canada (*Canada's Threatened Forests, A Statement by the Science Council*). The Executive of BCC recommended that a committee be formed to investigate the situation with a view to further BCC involvement. Taylor Steeves of the University of Saskatchewan was asked to Chair the committee which is composed of one representative from each constituent society of BCC. Doug Eidt is the representative for ESC.

Through the combined efforts of the Science Council, BCC, CCUBC and a private consultant, G.P. Bell, a *Directory of Canadian Field Research Stations 1983*, has been published. A BCC committee chaired by Brock Fenton of Carleton University has prepared a Field Station Policy Statement to aid in decisions concerning financial support of field stations.

The 1984 BCC Gold Medal is awarded to Dr. R.H. Haynes of York University.

Plans for the Canadian Congress of Biology to be held at the University of Western Ontario, June 23-28, 1985, are progressing well. Dr. David Walden, Department of Plant Sciences, UWO, is the Chairperson of the Steering Committee. Dr. G.B. Wiggins is the ESC representative to that committee.

The officers of BCC for 1983/1984 were as follows:
President: Dr. G.R. South, Department of Biology, Memorial University
Past President: Dr. K.G. Davey, Department of Biology, York University
Vice-Presidents: Dr. G.B. Wiggins, Department of Entomology, Royal Ontario Museum
Dr. J.R. Nursall, Department of Zoology, University of Alberta
Treasurer: Dr. L. Lapierre, Department of Biology, Université Moncton
Secretary: Dr. M.B. Fenton, Department of Biology, Carleton University
Members-at-Large: Dr. J. King, Department of Biology, University of Saskatchewan

Dr. D. B. Walden, Department of Plant Sciences, University of Western Ontario

Susan McIver
President, ESC,
ESC Representative to BCC

Report of the ESC Program Committee for the BCC Congress of Canadian Biology

Congress planning to date: The BCC Congress of Canadian Biology will be held at the University of Western Ontario on 23-28 June 1985. As the ESC representative on the Congress Steering Committee, G. B. Wiggins attended three planning meetings in London during the past year. Because the size and complexity of the meeting go far beyond voluntary services, all matters of Congress administration, announcements, registration, scheduling, etc. have been centralized and contracted to Congress Canada, a Toronto company experienced in handling large meetings. Accommodation and meals will be available on the University campus. The first announcement for the Congress was mailed to ESC members in September; the second announcement will be mailed in October to those responding, and the deadline for abstracts will be January 1985. Participating societies will be as follows: Canadian Society of Zoologists (annual meeting); Genetics Society of Canada (annual meeting); Canadian Phytopathological Society (annual meeting); Entomological Society of Canada; Canadian Council of University Biology Chairmen; Canadian Society of Microbiology.

All of the above except the Canadian Society of Microbiology are BCC constituents; the Canadian Society of Plant Physiologists, a BCC constituent, is not participating officially because of a prior commitment to meet jointly with their counterpart in the U.S. Total attendance is estimated to be 1200-1500 Canadians plus numbers of biologists from the United States.

Congress-level interdisciplinary symposia are as follows: Strategies of Parasitism, Predation, Mechanisms of disease resistance, Developmental and molecular biology, Soil biology, Ageing, Ecology of communities, Forestry, Biotechnology, Life in a cold climate, A-Animals B-Plants.

Several Congress-level lectures will be held, dealing with current biological subjects, but the topics and lecturers have not yet been selected. Plenary sessions will be held on Monday and Wednesday mornings, organized by the BCC and focussing on resource management and science policy in Canada. Financial support for Congress-level symposia and lectures will be sought by the Steering Committee from NSERC and the federal government's Public Awareness Program for Science and Technology. A strong response from commercial organizations to rent exhibit space has been received.

ESC Program: W. G. Friend is responsible for the scientific program of the ESC; three concurrent session of submitted papers are planned and poster sessions will also be arranged. The ESC will sponsor two symposia. A symposium on the Biological Survey of Canada organized by G. B. Wiggins is designed to meet the widespread interest in the Canadian biological community about this successful ESC initiative, summarizing achievements and setting out the procedures for other disciplines to follow. A symposium on insect pheromones organized by W. G. Friend will offer an important and currently active area of research for the interest of entomologists, and also for the wider biological community which has little opportunity to hear and meet workers active in this exciting new field of research. Support for the society-level symposia will be the responsibility of each Society, and it is proposed that ESC apply for an NSERC Conference Grant to defray expenses of participating speakers who cannot cover their own costs.

A. D. Tomlin is responsible for ESC local arrangements. A buffet dinner and social evening for ESC members will be held on Tuesday, June 25; and for the enjoyment of all Congress participants a slide showing of outstanding insect photographs with narration will be offered on Thursday evening, June 27. The Society will be allocated space for a business desk, the Congress focal point for the ESC and its activities; since the space is likely to be in a central area, the Board could consider materials concerning the Society that would be suitable for display, e.g. Society publications, sale of *Arctic Arthropods*, etc., and arrangements to staff such a booth. Since this is one of the very few occasions in which the sister biological societies of Canada will have encountered the ESC in action, the Program Committee believes that the Board may wish to consider carefully how it wishes entomology in

Canada to be seen professionally, particularly since the Board decided that most of the activities associated with an annual meeting will not take place at this Congress. Within that constraint, the Program Committee is extending its best effort to demonstrate that entomology under the ESC aegis is alive and doing quite well.

Future prospects: There is every reason to believe that the BCC Congress will be a successful event, and moreover one of unusual significance in bringing together for the first time a large part of the biological community in Canada. In many ways, that is the unique role played by the BCC for biology in this country. For this reason, the BCC is planning to make the Congress a regular feature of its program at 5-year intervals—the next one anticipated for 1990. Understandably, there is a problem of cash flow to meet necessary expenses at the beginning of the administrative process, and the BCC President has asked constituent societies for a loan to bridge this initial gap. Absolute guarantees are not possible, but if Congress is as successful as the organizers think it can be, the net return when all expenses are met will enable subsequent Congresses to meet the initial cash flow, and these events should become financially self sustaining.

ESC Program Committee for the BCC Congress
A. D. Tomlin
W. G. Friend
G. B. Wiggins, chairman

Report of the Representative to the Canadian National Committee, International Association on Water Pollution Research and Control (CNC/IAWPRC) for 1984

The Annual General Meeting of the CNC/IAWPRC on February 24, 1984 was the first AGM held since the newly constituted Committee was formally established by amalgamation of the former CNC/IAWPRC and the Joint Editorial Board of the Water Pollution Research Journal of Canada (WPRJC). A new concept and wider scope of the Journal was instituted, with Dr. R. J. Allan, National Water Research Institute, Burlington, as new editor-in-chief, 6 regional editors and 25 editorial board members. While the Journal in its previous form was often perceived as being wastewater technology and engineering oriented, the new editorial policy is designed to lead to a much stronger representation of biological-ecological aspects. This trend was also reflected in the program of the CNC-sponsored 19th Canadian Symposium on Water Pollution Research, held on February 23 at the Canada Centre for Inland Waters, Burlington. A brochure outlining the new orientation of the Water Pollution Research Journal of Canada is in preparation and will be mailed to the Entomological Society of Canada and other biological societies. Also in preparation is a revised constitution of CNC/IAWPRC, incorporating this evolution toward a more biology-oriented association, and promoting individual membership among a wider cross-section of Canadian professionals concerned with environmental problems.

A first circular and call for papers for an IAWPRC-sponsored international conference on Arctic Water Pollution Research (Yellowknife, April 28 - May 1, 1985) has been distributed. The 20th CNC-sponsored Annual Symposium on Water Pollution Research will be held in early 1985 at the University of Toronto (further announcements and call for papers to follow in various periodicals).

E. Scherer

Report of the Representative to the Committee of Parliamentarians, Scientists and Engineers (COPSE) for 1984

During the 1983-84 session COPSE held an annual general meeting (preceded by a tour of the National Research Council laboratories and a luncheon), an unstructured inaugural reception, and four regular luncheon meetings. The luncheon meetings each featured an invited speaker, followed by a period of general discussion. Each was preceded by a brief informal gathering. These events were intended to support the role of COPSE in helping to

improve parliamentary awareness of science (and vice versa), and topics were selected on the basis of interests expressed by COPSE members.

Subjects dealt with were:

(1) Advanced research and technology in Canada: some problems, some solutions (Dr. Fraser Mustard, President, Canadian Institute for Advanced Research)
(2) Energy in Canada: problems or solutions (Dr. Berry Welford, Vice-President, Marketing and Business, Petromont Inc.)
(3) University/Industry cooperation in technology development (Dr. M. Douglas Wright, President, University of Waterloo; Chairman, Task Force on Federal Policies and Programmes for Technology)
(4) Agriculture: cornerstone of the Canadian economy (Dr. Clay Switzer, President, Agricultural Institute of Canada).

All of these presentations emphasized the complexity of processes related to the supply of resources such as energy or food, and the difficulties of predicting events, setting policy, or organizing sufficiently powerful research enterprises, to solve the resulting complex problems. Each speaker also emphasized—unduly for my taste in some cases—a particular vested interest, for example, his parent institution or its specific concerns within the field of discussion.

Attendance by parliamentarians at most of these function was disappointing, although scientists and engineers were well represented. Some of the questions raised by the parliamentarians (mostly the same interested individuals at each meeting) tended to reflect specific interests generated by membership on particular House committees, for example. But other questions showed that several parliamentarians clearly appreciated the complexity of the issues raised (on a societal if not a technical level) and recognized the challenge that this presented in formulating appropriate, especially long-term, policies. One concrete mechanism to support the task of arriving at such policies was suggested during the 1982-83 session; unfortunately, this mechanism of non-partisan joint House-Senate committee, with professional scientific help, has not gone forward. The government appears to have expressed the view that such a committe should be set up in the context of parliamentary committees as a whole, requiring a general review of the situation.

In summary, I have been somewhat disappointed with COPSE this year, but it is still relatively new, and the progress of any such concept, given normal social and political realities, is usually measured on a scale of several years. At least the fact that the organization continues with support from parliamentarians, scientific societies, and the AASC offers hope for a more informed consideration of science in the future.

H. V. Danks

Report of the Public Education Committee for 1984

During 1983-84, 3 affiliate societies (Acadian, Quebec and Manitoba) applied for and received funds from the ESC supporting projects publicizing entomology. The SEQ used its funds to assist in the publication of *Les punaises terrestres (Hemipteres: Geocorises) du Quebec* by A. Larochelle. The Acadian will use its funds as a prize for the best student paper at the joint meetings in St. Andrews, and the Manitoba society used its funds to assist in the purchase of collecting equipment for the Manitoba Society.

At the ESC Governing Board Meetings in 1983, an increase from $100 to $200 per year was granted. Additionally, affiliate societies may still "save" up to 3 consecutive years of grants with the ESC and then apply for the bulk amount (now up to a maximum of $600). Most societies are current to at least 1983, so the new Public Education Committee should anticipate a spate of requests over the next 1-2 years.

The Science Writer's Association of Canada has still not responded to the annotated directory of Canadian entomologists. Neither has it sent us a directory of Science Writers. I leave this topic for the new committee.

The Public Education Committee requests that $1400 (7 × 200) be budgeted to cover 1984-85 grant requests. In addition, up to $1100 remains as yet unrequested by the affiliated societies for the previous 2 years.

Alan D. Tomlin (Chairman)

Scientific Committee of the Biological Survey of Canada (Terrestrial Arthropods): Report for 1984

Details of the operations and activities of the Scientific Committee are contained in the 1984 Annual Report to the National Museum of Natural Sciences: brief summaries have appeared during the year in the Bulletin [15(3): 101 (1983); 16(1): 16-17 (1984)]. Some of the main items are as follows:

(1) The Committee met in Ottawa on October 13-14, 1983 and April 26-27, 1984.
(2) Drs. Campbell, Kevan, Matthews and Scudder were reappointed to the Committee for a further 3-year term. Dr. G. E. Ball joined the Committee as a replacement for Dr. J. R. Spence. Dr. G. W. Argus replaced Dr. D. McAllister as the NMNS Scientific Staff representative.
(3) Committee members were involved in the organization of an international conference on the *Faunal influences on soil structure* in Edmonton in June 1984. This was followed by a workshop on Collembola at Kananaskis.
(4) The Committee has organized a symposium on the aquatic insects of peat lands and marshes for the 1984 annual ESC meeting in St. Andrews.
(5) The Committee is planning the ESC symposium on the Biological Survey for the BCC Canadian Congress of Biology in 1985.
(6) A document was prepared for the National Museum of Natural Sciences on the "Expansion of the Biological Survey of Canada".
(7) A brief on *The potential role of National Parks as Biological Survey sites* was submitted to the Parks Canada - Canadian Assembly Project *Heritage for Tomorrow*.
(8) The Committee reviewed the NSERC Guidelines with respect to the Ownership of Specimens, and submitted a proposal for rewording to NSERC.
(9) The BCC draft document on Field Stations was reviewed.
(10) Briefs on environmental disturbance and environmental impact assessment were discussed.
(11) Initial discussions have started on long term study of climatic change.
(12) A taxonomic project on the Ephemeroptera of Canada has been initiated.
(13) Documents describing the activities of the BSC have been distributed to other similar international agencies. The Chairman met with a representative of the Australian Bureau of Flora and Fauna to discuss the Australian Biological Resources Study. The Survey has supported the initiatives of the ESA Committee on Systematic Resources. A joint paper with the latter on "Biological Surveys" was given at the XVII International Congress of Entomology in Hamburg.
(14) A paper on *Regional collections and the concept of regional centres* was published in Syllogeus [44: 151-160 (1983)].
(15) Additional numbers of the Newsletter were published.
(16) A second issue of the grasslands Newsletter appeared in 1984.

G. G. E. Scudder (Chairman)

Report of the By-Laws, Rules and Regulations Committee for 1984

The By-Laws, Rules and Regulations Committee has not met as a full committee in 1984. As a result of actions taken at the 1983 Governing Board Meeting in October, the Chairman of the Committee has assisted the Secretary in updating the Standing Rules. Rules and Regulations, and Committee Guidelines for the Scientific Committee of the Biological Survey of Canada (Terrestrial Arthropods) have been prepared and submitted to the President. A proposed amendment to Standing Rule VI, concerning the Treasurer, has been prepared.

D. M. Rosenberg
L. B. Smith
N. D. G. White (Chairman)

Report of the Membership Committee for 1984

A form to solicit new members was prepared for inclusion in the December Bulletin. No nominations were received for honorary membership in 1984. The first call for 1985 honorary members will be published in the December Bulletin.

The membership of the society increased during 1983 but preliminary figures indicate that there will be little change in membership for 1984.

	Student Members	Regular Members	Total Members
Dec. 1982	190	756	946
Dec. 1983	222	815	1,037

J. M. Campbell (Chairman)

Report of the Fellowship Selection Committee for 1984

The committee selected 5 new Fellows from 26 nominations. Only two of these nominations had been made in the current year, the remaining 24 being on file, as supplied to the 1983-84 Committee by Dr. R. A. Brust.

The ESC Board of governors approved the selection and the following entomologists will be honoured at the annual meeting of the Society in October 1984:

D. G. Harcourt, Ottawa, Ontario
P. Harris, Regina, Saskatchewan
E. E. Lindquist, Ottawa, Ontario
W. D. Seabrook, Fredericton, N.B.
I. W. Varty, Fredericton, N.B.

Several nominations have now been on file for more than two years and it is becoming difficult to assess the contributions of such ESC members from the information available. The next Fellowship Selection Committee will therefore have to make a special effort to seek nominations and to encourage renominations. As chairman of the committee I am prepared to speak on the matter at the 1984 Annual meeting.

Respectfully submitted,
B. J. R. Philogène (Chairman)

Report of the Nominating Committee for 1984

The Nominating Committee invited the individuals whose names appear below to stand for election in 1984, for the positions noted. In turn, these individuals have agreed to serve, and have so indicated in writing. A copy of this slate was sent to the Editor of the Bulletin on January 20, 1984, for publication in the March issue as notice to the members.

SLATE OF CANDIDATES

Second Vice-President:	Dr. B. J. R. Philogène Dr. G. G. E. Scudder
Director-at-Large:	Dr. C. Cloutier Dr. G. Pritchard Dr. D. M. Rosenberg
Fellowship Selection Committee:	Dr. S. R. Loschiavo Dr. J. E. McFarlane Dr. R. W. Stark

Submitted by:
P. W. Riegert
J. A. Shemanchuk
G. E. Ball (Chairman)

Report of the Elections Committee for 1984

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

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

Second Vice-President: G.G.E. Scudder
Directors-at-Large: C. Cloutier and G. Pritchard
Fellowship Selection Committee: S.R. Loschiavo and R.W. Stark

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

Glenn K. Morris (Chairman)

Report of the Achievement Awards Committee for 1984

The Achievement Awards Committee received 5 nominations for the 1984 Gold Medal and 2 for the C. Gordon Hewitt Award. After consideration of all nominees, the Committee recommended that Dr. Kenneth George Davey receive the Gold Medal and that the Hewitt Award not be given. This recommendation was approved by the Executive at their mid-term meeting in Ottawa, April 24-25, 1984.

A biographical sketch of Dr. Davey was prepared for the September Bulletin and for the brochure to be distributed at the Annual Meeting, St. Andrews, Oct. 1-4, 1984.

Press releases were prepared and sent to the editors of scientific publications, publicity offices of pertinent universities and to local news media.

A call for nominations for the 1985 Gold Medal and C. Gordon Hewitt Awards was placed in the June issue of the Bulletin along with an article calling attention to the lack of nominees for the Hewitt Award.

Respectfully submitted,
Harold F. Madsen (Chairman)

Report of the Scholarship Committee for 1984

Seven applications for scholarships were received, one of which was disqualified and another subsequently was withdrawn. All applications were outstanding and the decisions difficult.

The winners were Heather J. McAuslane of the University of Guelph, Supervisor—C. R. Ellis, and Louis Mills of Université Laval, supervisor—J. McNeil.

In 1982, the last year for which figures are available, $3400 was earned in interest and $1340 was received in donations. The capital fund reached $31,275.

R. Shepherd (Chairman)

Report of the Employment Committee for 1984

The Employment Committee has now completed compiling, publishing and distributing the 1984 edition of the Résumé Booklet. Résumé questionnaires were sent to all student members of the ESC. Approximately 200 questionnaires were distributed and 25 returned. Two hundred copies of the booklet were sent to all employers of entomologists in Canada. In addition, the booklet has been sent and will continue to be sent to those employers advertising job vacancies for entomologists throughout North America.

The 25 résumés returned this year are the smallest number received since 1979 (see Table below) and indicates a declining interest in participation in the résumé booklet. Personal communication with graduate students from several Canadian universities points to a need to demonstrate the effectiveness of the booklet in terms of jobs received. The declining use of the booklet by graduate students will ultimately lead to a declining use by employers of entomologists, by virtue of its being less representative of those students seeking employ-

ment (our cover letter accompanying the résumé booklet states, "the purpose of this publication to provide employers access to a *significant* number of entomologists in addition to those contacted by more conventional means"). Only when the résumé booklet becomes more complete and representative of the graduate students seeking employment will the booklet itself be utilized more fully.

The Employment Committee recommends that preparation for publication of next year's résumé booklet include the sending of letters to Professors and Department Heads encouraging them to have their graduate students submit résumés to help make the booklet more complete. In addition, we recommend that a questionnaire be sent to those employers of entomologists who have received the résumé booklet in the past. The questionnaire would ask if the participants in the booklet had been considered for any entomological position. This information could, in turn, be provided to graduate students at the time they are asked to submit their résumé—thereby providing some measure of the effectiveness of the booklet.

Number of graduate students participating in Résumé Booklet

	Ph.D.	M.Sc.	B.Sc.	Total
1979	33	34	5	72
1980	31	18	7	56
1981	30	16	0	46
1982	32	25	4	61
1983	18	15	6	39
1984	14	11	0	25

Brian D. Prystupa (Chairman)

Report of the Heritage Committee for 1984

The following items were assembled and sent to the Public Archives of Canada for inclusion in the collection of the Entomological Society of Canada:

(1) Program, brochures, notices, etc., Annual Meeting, Banff, 1981.
(2) Program, brochures, notices, etc., Annual Meeting, Regina, 1983.
(3) Program, Annual Meeting, Toronto, 1976.
(4) C. Gordon Hewitt Award Brochure (S. B. McIver), 1978.
(5) F. T. Lord: History of Entomology in Nova Scotia, 1983.

Work is continuing in the sorting, evaluation, and retention of the 15-year accumulation of Society documents transferred to the Committee two years ago from the files of the Secretary. Progress is being made, but it is slow. Some professional assistance may be obtained from University Library personnel to expedite the work. It is expected that the assessment and selection of this archival material will be completed in the year ahead.

Respectfully submitted,
P. W. Riegert (Chairman)

Report of the Committee on Common Names and Insect Cultures for 1984

Following the Annual Meeting, 1983, the provisional list of English Common Names of Insects was prepared for distribution on request. One hundred copies were prepared of which 25 were asked for. Comments and corrections were solicited. The responses received by June 30, 1984, demanded that there be a redrafting of the whole list into a scientific name-English name/English name-scientific name format. This redrafting is now nearly complete. The new format will be submitted to the Board for their consideration.

Preliminary contact has been made by the Society President with the Quebec Society for the Protection of Plants about the possibility of joint publication of the new revision of the French list and the English list. Further discussions with the Quebec Society are continuing.

A list of *Laboratory Cultures of Insects and Other Arthropods in Canada* is revised every two years. This was done in 1983. A copy of this list is available to anyone who requests it.

W. Y. Watson (Chairman)

COMMITTEES OF THE ENTOMOLOGICAL SOCIETY OF CANADA

Proposed Members for 1984-85

Nominating			
Ray F. Morris (Chairperson)		(709) 772-4763	St. John's West
I. W. Varty			Fredericton
W. G. Evans			Edmonton
Elections			
G. K. Morris (Chairperson)		(416) 828-5306	Mississauga
F. M. Barrett			Toronto
Dave Gibo			Mississauga
Fellowship			
J. A. Downes (Chairperson)	1985	(613) 996-1665	Ottawa
D. E. McE. Kevan	1985		Ste. Anne de Bellevue
J. H. Borden	1986		Burnaby
W. G. Friend	1986		Toronto
S. R. Loschiavo	1987		Winnipeg
R. W. Stark	1987		Portland
Achievement Awards			
G. G. E. Scudder (Chairperson)		(604) 228-3168	Vancouver
Annual Meeting			
1985			
D. E. Bright (Chairperson)		(613) 996-1665	Ottawa
A. Hudson (Co-Chairperson, Program)			Ottawa
P. T. Dang (Co-Chairperson, Local Arrangements)			Ottawa
1986			
N. Holliday (Chairperson)			Winnipeg
G. Gerber (Co-Chairperson, Program)			Winnipeg
J. Conroy (Co-Chairperson, Local Arrangements)			Winnipeg
T. D. Galloway (Regional Director E.S. Manitoba)			Winnipeg
By-laws, Rules and Regulations			
N. D. White (Chairperson)	1985	(204) 269-2100	Winnipeg
D. M. Rosenberg	1986		Winnipeg
L. B. Smith	1986		Winnipeg
Employment			
B. D. Prystupa (Chairperson)		(519) 824-4120 ext. 3937	Guelph
S. M. Smith			Toronto
R. Currie			Winnipeg

Finance

H.V. Danks (Chairperson)	1985	(613) 998-9262	Ottawa
D. Barnes	1985		Toronto
J.R. McLean	1985		Vancouver
A.C. Schmidt	1986		Ottawa
H.J. Teskey	1986		Ottawa
V. Behan-Pelletier	1987		Ottawa

Heritage

P.W. Riegert (Chairperson)		(306) 584-4224	Regina
A.M. Harper			Lethbridge
W.W. Judd			London
A.W. MacPhee			Kentville

Insect Common Names and Cultures

W.Y. Watson (Chairperson)		(519) 884-1970	Waterloo
E.M. Belton (ESBC)			Burnaby
P. Benoit (E.S. Que.)			Quebec
J.S. Kelleher			Ottawa
J.E.H. Martin			Ottawa
G.B. Neill (E.S. Sask.)			Indian Head
A.G. Robinson (E.S. Man.)			Winnipeg
J. Spence (E.S. Alta.)			Edmonton
P.D. Syme (ESO)			Sault Ste. Marie
L.S. Thompson (Acad. E.S.)			Charlottetown

Membership

J.M. Campbell (Chairperson)	1985	(613) 996-1665	Ottawa
J. Weintraub (E.S. Alta.)			Lethbridge
P.G. Mason (E.S. Sask.)			Saskatoon
R.E. Roughley (E.S. Man.)			Winnipeg
H.B. Specht (Acad. E.S.)			Kentville
B. Roitberg (ESBC)			Vancouver
G. Kinoshita (ESO)			Toronto
(pending) (E.S. Que.)			

Public Education

G. Pritchard (Chairperson)		(403) 284-5261	Calgary
J.D. Shorthouse			Sudbury
D.F. Hilton			Lennoxville
T.D. Galloway (E.S. Man.)			Winnipeg
J.S. Kelleher (ESO)			Ottawa
D.A. Craig (E.S. Alta.)			Edmonton
P.W. Riegert (E.S. Sask.)			Regina
R.H. Storch (Acad. E.S.)			Orono
P.P. Harper (S.E. Que.)			Montreal
R. Cannings (ESBC)			Victoria

Publications

M. Mackauer (Chairperson)		(604) 291-4808	Burnaby
C.D. Dondale	1985		Ottawa
T.D. Galloway	1985		Winnipeg
D. Lafontaine	1987		Ottawa
A. Thomson	1987		Victoria
A. Maire	1987		Trois Rivières
G.C.D. Griffiths	1987		Edmonton

Scholarships

R.F. Shepherd (Chairperson)	1986	(604) 388-3811	Victoria
W. Charnetski (E.S. Alta.)			Lethbridge
S.C. Jay (E.S. Man.)			Winnipeg
R.H. Storch (Acad. E.S.)			Orono
L. Safranyik (ESBC)			Victoria
R. Elliott (E.S. Sask.)			Saskatoon
J.E. Laing (ESO)			Guelph
(pending) (E.S. Que.)			

Science Policy

H. F. Madsen (Chairperson)	(604) 494-7711	Summerland
G. G. E. Scudder		Vancouver
P. J. Albert (BCC)		Montreal
S. B. Hill (AASC)		Ste. Anne de Bellevue
O. N. Morris		Winnipeg
N. P. D. Angerilli		Summerland
G. Pritchard (Public Education)		Calgary

Biological Council of Canada

S. B. McIver	(519) 824-4120 ext. 3921	Guelph
R. G. H. Downer	(519) 885-1211	Waterloo
P. J. Albert	(514) 879-5995	Montreal

International Association on Water Pollution Research & Control (CNC/IAWPRC)

E. Scherer	(204) 949-5004/5	Winnipeg

AASC

S. B. Hill	(514) 457-2000	Ste. Anne de Bellevue

COPSE

H. V. Danks	(613) 998-9262	Ottawa

Biological Control in Canada

J. E. Laing (Chairperson)	(519) 824-4120 ext. 2136	Guelph

Insect Losses—Phase II

Scientific Committee

G. H. Gerber (Chairperson)	(204) 269-2100	Winnipeg
C. R. Ellis		Guelph
J. F. Doane		Saskatoon
E. C. Becker		Ottawa

Study Team

M. Stemeroff		Guelph
D. J. Madder		Guelph

Microbial Insecticides

O. N. Morris (Chairperson)	(204) 269-2100	Winnipeg
J. C. Cunningham		Sault Ste. Marie
R. P. Jaques		Harrow
J. Finney		St. John's
G. Kinoshita		Willowdale

Biological Survey of Canada (Terrestrial Arthropods)

Scientific Committee

G. G. E. Scudder (Chairperson)	(604) 228-3168	Vancouver
G. W. Argus (NMNS)		Ottawa
G. E. Ball		Edmonton
V. M. Behan-Pelletier		Ottawa
J. M. Campbell		Ottawa
R. A. Cannings		Victoria
K. G. Davey		Downsview
J. A. Downes		Ottawa
A. R. Emery (Director, NMNS) (or delegate)		Ottawa
P. P. Harper		Montreal
D. K. McE.Kevan		Ste. Anne de Bellevue
D. J. Larson		St. John's
D. M. Lehmkuhl		Saskatoon
J. V. Matthews		Ottawa
S. B. McIver (President, ESC)		Guelph

R. F. Morris		St. John's West
G. A. Mulligan (Director, BRI) (or delegate)		Ottawa
D. M. Rosenberg		Winnipeg
I. M. Smith		Ottawa
G. B. Wiggins		Toronto
D. D. Williams		West Hill
Secretariat		
H. V. Danks	(613) 998-9262	Ottawa

WANTED: Archival Material

Four Programs of Annual Meetings of the Entomological Society of Canada are required to complete our collection (1951-83) in the Public Archives of Canada. Needed are programs for the years 1974 (Halifax), 1975 (Saskatoon), 1978 (Ottawa), and 1979 (Vancouver). If there are members who attended these meetings, have no further use for their programs and would like to donate them to the Archives, their actions would be sincerely appreciated. Please send them to: Heritage Committee, c/o Dr. P. W. Riegert, Biology Department, University of Regina, Sask. S4S 0A2.

Other Society material, especially photos, would be most welcome upon receipt.

EXECUTIVE COUNCIL MEETING

Notice

The midterm meeting of the Executive Council will be held in April, 1985 in Ottawa. Matters for consideration at the meeting should be sent to the Secretary, Mr. J. A. Shemanchuk, Research Station, Agriculture Canada, Lethbridge, Alberta, T1J 4B1.

CALL FOR NOMINATIONS

Nominations for Election, 1985

The Nominating Committee (R. F. Morris, Chairman) will prepare a slate of nominations for Second Vice-President, two Directors-at-Large and two members of the Fellowship Selection Committee.

Nominations from the membership may be submitted in writing over the signatures of at least three active members of the Society, with a signed statement from the nominee indicating his willingness to accept office if elected. Such nominations shall be submitted to the Secretary, Mr. J. A. Shemanchuk, Research Station, Agriculture Canada, Lethbridge, Alberta, T1J 4B1, not later than 30 April, 1985.

Les nominations pour les postes de 2ème Vice-Président, deux Administrateurs-libres et deux membres du Comité de Selection des Compagnons devront parvenir au Secrétaire de la Societé à l'adresse ci-dessus, sous la signature d'au moins trois mêmbres actifs de la Societé, en plus d'une declaration du candidat exprimant son acceptation d'une telle nomination, et le poste s'il est elu.

Fellows of the Entomological Society of Canada: Guidelines and Call for Nominations, 1985

An Active Member (i.e. an Ordinary Member or a Student Member) of the Entomological Society of Canada who has made a major contribution to entomology may be elected a Fellow of the Society. The contribution may be in any area—research, teaching, application or administration—and may be judged on the basis of a contribution to or stimulation of the work of others as well as by direct personal effort. It will usually, though not necessarily, be cumulative over a number of years.

The number of Fellows must not exceed ten percent of the Active Membership of the Society. At the present time this suggests that about five new Fellows will be elected in a typical year, more or fewer according to the nominations presented. The call for nominations is published annually in the December issue of the *Bulletin*. Nominations may be made over the signatures of any four Active Members of the Society; the Fellowship Selection Committee then considers the nominations received and makes the definitive nominations to the Governing Board. Nominations should be addressed to the Chairman of the Fellowship Selection Committee or to the Secretary of the Society.

The nomination should be made in not more than four pages. It should include a critical review of the nominee's contribution to entomology, which as already noted may be in any area of the field. It should describe or identify clearly the major contribution(s) that the nominee has made, but it need not include a formal C.V. or a complete list of publications, although, of course, certain details from these would usually be desirable.

The call for nominations for 1985 is made herewith. Nominations should reach the undersigned, or the Secretary, ESC, postmarked no later than 28 February 1985.

J. A. Downes, Chairman
Fellowship Selection Committee, ESC
Biosystematics Research Institute
Agriculture Canada
Ottawa, Ontario, K1A 0C6

Nominations for Honorary Members, 1985

The Society has a vacancy for up to two new honorary members. Please forward nominations to the chairman of the Membership Committee before March 1, 1985.

All nominations must be accompanied by a one or two page biographical sketch, highlighting those accomplishments that contributed to his/her being considered for honorary membership.

J. M. Campbell, Chairman
Membership Committee, ESC
Biosystematics Research Institute
Agriculture Canada
Central Experimental Farm
Ottawa, ON K1A 0C6

MISCELLANEA

Nuclearbombus, new subgenus (or how to eliminate bumblebee subgenera and learn to love the *Bombus*)*

Fuzzy thinking Bumblebee workers have gesplitert *Bombus* beyond all reason. There are so many subgenera in *Bombus* (a veritable plethora) that it is now a case of not being able to see the forest for the trees (or is it setae?). One might call this the fuzz factor (i.e., do plumose hairs indicate featherbrains?). *Nuclearbombus* (synonym: *Atomicbombus*) is proposed here as a remedy for this sad situation because it will destroy all subgeneric names, leaving us with nothing but species groups, which, after all, is what these "subgenera" really are.

*A response to the recent paper by Laverty, Plowright and Williams, 1984, Can. Ent. 116: 1051-1056. Arnold S. Menke, USDA, & James Carpenter

POSITION AVAILABLE

Applications are invited for the position of *Taxonomist* in the *Commonwealth Institute of Entomology (Taxonomy/Identification Service), Commonwealth Agricultural Bureau.*

Duties: To provide identifications and supportive research and training in the Coleoptera, chiefly in the families Coccinellidae, Buprestidae, Tenebrionidae and Cerambycidae. The appointee will be a member of the Institute's Taxonomy/Identification Service which is located in the British Museum (Natural History) in London, UK.

Qualifications: A higher degree in Entomology, preferably with emphasis on taxonomy.

Terms of appointment: An appointment may be made on a permanent baiss, alternatively secondment or a term appointment for 5 years would be considered.

Salary: In the scales £5682 - £7765; £7149 - £9561 with Inner London Weighting of £1250 per annum, with the possibility of progression to higher scales. The initial salary will be according to age, qualifications and experience.

Application forms and further particulars are available from the Director, Commonwealth Institute of Entomology, 56 Queen's Gate, London, SW7 5JR, UK.

Closing date for receipt of applications: 31 January 1985.

NEWS OF ORGANIZATIONS

CanaColl Foundation

Edward C. Becker, founder and president of the CanaColl Foundation, was recently presented with a commemorative award by the then Minister of Agriculture Canada, Eugene Whelan. The award, only the second such given by this ministry, was in honor of the 10th anniversary of CanaColl and consisted of a framed certificate and a brass plaque.

The CanaColl Foundation is an independent, non-profit organization established to promote taxonomic research on the Canadian National Collection (CNC) of insects and related arthropods, which is housed in the Biosystematics Research Institute of Agriculture Canada.

The CanaColl Endowment Fund contains over $25,300, and with accrued interest CanaColl has supported 51 research grants to curate areas of the CNC where expertise is lacking among the resident curators. These grants represented 83.2 person-weeks of research and totaled $15,066 (only out-of-pocket expenses were covered). The visiting researchers have

Edward C. Becker (left), and Mrs. Becker, receiving commemorative award from the then Minister of Agriculture Canada, Eugene Whelan, in honor of the 10th anniversary of CanaColl.

been mostly from Canada and the United States, but several have been from other countries.

A second fund, the CanaColl Development Fund, was recently established wherein both principle and interest can be used to support a broad range of research on the CNC. Agriculture Canada made the first substantial donation ($1,000) to this fund as part of its commemorative award.

International Commission on Zoological Nomenclature

Reference: ITZN 11/5 A.N.(S.) 131 24 August 1984

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in the *Bulletin of Zoological Nomenclature*, volume 41, part 3, on 23 August, 1984 and would welcome comments and advice on them from interested zoologists.

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

Case No.

239 *Tibicina* Amyot, 1847 and *Lyristes* Horváth, 1926 (Insecta, Hemiptera, Homoptera): proposed conservation by the suppression of *Tibicen* Berthold, 1827. Also, Arguments pour la suppression du nom de genre *Tibicen* et de ses dérivés dans la nomenclature de la superfamille CICADOIDEA.

2142 *Hypocryphalus mangiferae* (Stebbing, 1914) (Insecta, Coleoptera): proposed conservation under the plenary powers.

R. V. Melville (Secretary)
c/o British Museum (Natural History)
Cromwell Road
London SW 7 58D
England

PERSONALIA

William Seabrook is the new dean of graduate studies and research at the University of New Brunswick. Dr. Seabrook joined the UNB biology department in 1967. Since that time his work on controlling the spruce budworm has become well known. Dr. Seabrook will continue to teach and conduct research while holding the dean's position.

Margaret R. McBride retired recently as Managing Editor of *The Canadian Entomologist*. She was honoured at the ESC Annual Meeting held in St. Andrews, N.B. Margaret served the Society for many years, and her dedication to producing the Journal has been greatly appreciated.

Margaret R. McBride, honoured at the ESC meeting, St. Andrews, 2 October 1984.

MEETINGS

Announcements

Annual Meeting *Entomological Society of Canada*, at the Skyline Hotel, Ottawa, Ontario, on 23-25 September 1985 (see below for further information).
CONTACT: Dr. D.E. Bright, Biosystematics Research Institute, K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C5. Telephone (613) 996-1665.

I Canadian Congress of Biology, organized by the Biological Council of Canada, at the University of Western Ontario, London, Ontario, on 23-28 June 1985 (see below for further information).
CONTACT: Dr. Glenn Wiggins, Department of Entomology, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6.

Annual Meeting *Florida Entomological Society*, at the Sheraton Hotel, Ocho Rios, Jamaica, on 5-8 August, 1985.
CONTACT: Dr. Carl S. Barfield, Department of Entomology and Nematology, 3103 McCarty Hall, University of Florida, Gainesville, FL 32611, U.S.A. Telephone (904) 392-7089.

Western Forest Insect Work Conference, at the Hilton Harvest House, Boulder, Colorado, on 5-7 March 1985.
CONTACT: Dr. B. Moody, Northern Forest Research Centre, 5320-132 St., Edmonton, Alberta T6H 3S5. Telephone (403) 435-7210.

Joint Meeting *Northeastern Forest Pest Council* and *Northeastern Forest Insect Work Conference*, at the Holiday Inn-Downtown, Portland, Maine, on 12-15 March 1985.
CONTACT: Douglas C. Allen or Lawrence P. Abrahamson, SUNY College of Environmental Science and Forestry, Syracuse, NY 13210. Telephone (315) 470-6742.

Workshop on the Care and Maintenance of Natural History Collections, in conjunction with the Annual Meeting of the *Canadian Museums Association*, at the Royal Ontario Museum, Toronto, Ontario, on 21-22 May 1985.
CONTACT: Janet Waddington, Department of Invertebrate Palaeontology, Royal Ontario Museum, Toronto, Ontario M5S 2C6. Telephone (416) 978-3678.

Triennial Meeting *Pan American Acridological Society*, at the University of Saskatchewan, Saskatoon, Saskatchewan, on 30 July - August 1985.
CONTACT: Dr. A.B. Ewen, Local Chairman, PAAS, Research Station, Agriculture Canada, 107 Science Crescent, Saskatoon, Saskatchewan S7N 0X2. Telephone (306) 343-8214.

International Symposium on Establishment of Forage Crops by Conservation-Tillage Methods: Pest Management, at the State College, Pennsylvania, on 15-21 June 1986.
CONTACT: The Organizing Secretary, International Symposium, U.S. Regional Pasture Research Laboratory, University Park, PA 16802, U.S.A.

III International Congress of Systematic and Evolutionary Biology, at the University of Sussex, Brighton, England, on 4-10 July 1985.
CONTACT: Dr. B. Cox, ICSEB Congress Office, 130 Queen's Road, Brighton, Sussex BN1 3WE, U.K.

XVIII International Congress of Entomology, at the University of British Columbia, Vancouver, B.C., on 3-9 July 1988 (see below for further information).
CONTACT: Dr. G.G.E. Scudder, Secretary General, XVIII International Congress of Entomology, Department of Zoology, University of British Columbia, Vancouver, B.C. V6T 2A9. Telephone (604) 228-3168.

1985 Meeting Entomological Society of Canada: First Announcement

Dates: 23-25 September 1985

Location: Skyline Hotel, Ottawa, Ontario

Theme: ENTOMOLOGY ON THE NORTHERN HORIZON

Symposia: Agricultural Entomology in the Boreal Life Zone
The Status of Research and the Potential Use of Microbial Control
Biosystematic Problems in Northern Entomology
President's Prize (Student Competition)
Submitted Papers
*Special interest groups
*Poster sessions
*Workshops

CONTACTS: D.E. Bright, Chairperson
P.T. Dang, Local arrangements
Biosystematics Research Institute, K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C6.
A. Hudson,
Program Research Coordination, Research Branch, Agriculture Canada, Sir John Carling Building, Carling Avenue, Ottawa, Ontario K1A 0C5.

*Please send suggestions for any of these to D.E.B. or A.H. (above).

BCC Canadian Congress of Biology: Update

Members of the Entomological Society of Canada received the first notice for the Congress with a recent issue of *The Canadian Entomologist*, and are reminded that further information will be sent only to those returning the address card printed there or in the advertisement in this issue of the Bulletin. The Congress offers an opportunity for those favouring full and active participation of the Society in the Canadian community of biological science to show their support; a reduced registration fee for students is added encouragement.

With planning for the program now nearing completion, it is clear that on several counts the Congress will be an event in Canadian biology. Scientific paper and poster sessions and symposia held by six participating societies, coupled with interdisciplinary Congress-wide symposia will provide a unique opportunity for all biologists to broaden their understanding of current developments in their science. Subjects of the Congress Symposia are: Ageing, Biotechnology, Developmental Biology, Disease Resistance, Ecology of Communities, Forestry Research in Canada, Life in a Cold Climate (a, Animals; b, Plants), Molecular Biology, Parasitism, Predation, Soil Biota and Fertility. Two half-day plenary sessions will bring into focus some of the major biological issues confronting Canada, in terms of the wise use of renewable natural resources and of the current capability of biological science to meet future needs. In three special evening lectures scientists who are outstanding speakers will interpret some important biological questions. Workshops will demonstrate advanced techniques in laboratory and computer procedures applicable to biological research of all types. There will be a strong contingent of commercial exhibits of scientific equipment and books. Participants can meet each other socially at two Congress receptions, theatre groups will be available for the nearby Stratford Shakespearean Festival, and other local attractions will be offered to participants and/or spouses. For ESC members attending the Congress, a buffet dinner and informal social evening will be held on the evening of Tuesday, June 25. Accommodation and meals are available at reasonable cost at the University, or elsewhere if preferred.

The Entomological Society of Canada will sponsor two symposia. A symposium on the Biological Survey of Canada is designed to meet the widespread interest in the Canadian biological community about this successful ESC initiative, summarizing achievements and setting out the procedures for other disciplines to follow. A symposium on insect pheromones will offer this important and currently active field for the interest of entomologists,

University of Western Ontario
June 23-29, 1985

CANADIAN CONGRESS OF BIOLOGY

CONGRÈS CANADIEN DE BIOLOGIE

SPONSORED BY:

BIOLOGICAL COUNCIL OF CANADA
CONSEIL CANADIEN DE BIOLOGIE

Secretariat: Congress Canada, Suite 603, 250 University Avenue, Toronto, Ontario, M5H 3E5 (416) 591-1498

Further announcements will be sent only to those returning the form below.

PARTICIPATING SOCIETIES

The Canadian Botanical Association
The Canadian Council of University Biology Chairmen
The Canadian Society of Microbiology
The Canadian Society of Zoologists
The Canadian Phytopathological Society
The Entomological Society of Canada
The Genetics Society of Canada

Call for Abstracts

Abstract and registration forms will be mailed to those requesting same in the fall of 1984. Deadline for receipt of Abstracts: January 31, 1985.

Registration Fee

	Regular	Student
Registrations received before April 30, 1985	$100	$50
Registrations received after April 30, 1985	140	70
Single day Registrations	50	35

CANADIAN CONGRESS OF BIOLOGY

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☐ Registration information only
☐ Registration and abstract information

Accommodation reservation cards will automatically be sent.

Return to: Congress Canada, Suite 603, 250 University Avenue, Toronto, Ontario, M5H 3E5

and also for the wider biological community which has little opportunity to hear and meet workers active in this exciting new area of research. Members of the Society are urged to present scientific papers or posters at sessions organized by the ESC Program Committee; communications inviting interaction with other sectors of biology would be especially appropriate. Abstracts are submitted to the Congress Registration office with forms supplied on receipt of the address card, and are due in January 1985. Abstracts for all scientific communications will be printed in a single volume available to registrants, and it is expected that this volume will become a library reference attesting to the depth and vigour of biological science in Canada. Because entomology is one of the sectors of Canadian science for which this country is best known in the international community, it would be an unfortunate deficiency in the record of this Congress if the research of members of the Entomological Society of Canada was not well represented.

Please contact the chairman of the Program Committee (416-978-8743) for any additional information required.

ESC Congress Program Committee
A. D. Tomlin
W. G. Friend
G. B. Wiggins (Chairman)

XVII International Congress of Entomology, Hamburg

Approximately 2,600 delegates attended the XVII International Congress of Entomology at Hamburg, 20-26 August 1984, and they came from 86 countries. The congress was opened on Monday, 20 August, by the Chairman of Council, Dr. D. F. Waterhouse, and the theme speaker was the President of Congress, Prof. Dr. B. Heydemann, University of Kiel. The title of Dr. Heydemann's paper was *Insect as Successful Construction.*

The Congress was comprised of 22 Sections, including symposia and workshops attached to the sections. Ninety-one Canadians attended and the majority participated in a wide number of Sections, but particularly in the Systematics & Phylogeny Section. Sessions were held simultaneously at the Congress Consortium Centre, C.P. Plaza, and the University of Hamburg. Social activities included a welcoming party on Sunday evening, 19 August, and a farewell party on Friday evening, 24 August. The closing lecture entitled *Integrated Crop Protection—realities and prospects* was given by Dr. M. J. Way, Imperial College, U.K.

Ray F. Morris
Past President

XVIII International Congress of Entomology, Vancouver

The Council for International Congresses of Entomology, meeting in Hamburg at the time of the XVII Congress, accepted the invitation of the Entomological Society of Canada, to hold the XVIII Congress in Vancouver, British Columbia, July 3-9, 1988. The Congress will be held at the University of British Columbia, with accommodation available in both University residences and downtown hotels.

Dr. G. G. E. Scudder has been named President and Secretary General of the Congress by the Governing Board of the Entomological Society of Canada. Other members of the Organizing Committee are G. E. Ball, K. G. Davey, S. Loschiavo, J. McNeil and I. M. Smith.

XVIII International Congress Symbol

ESC Members, non-member entomologists and other interested persons, are invited to submit a design for the symbol of the Congress. The design should include the name, number, date and location of the Congress: an explanatory note on the design should also be enclosed. The symbol selected will be used on all Congress correspondence, announcements and publications. Submissions should be addressed to: Dr. G. G. E. Scudder, Secretary General, XVIII International Congress of Entomology, c/o Department of Zoology, University of British Columbia, Vancouver, B.C. V6T 2A9. Designs should be sent to arrive prior to the deadline of June 15, 1985.

XVIII^{e} Congres International d'Entomologie

Lors du XVII^{e} Congrès international d'entomologie à Hambourg, le Conseil a accepté l'invitation de la Société Entomologique du Canada de tenir le XVIII^{e} Congrès à Vancouver, Colombie-britannique du 3-9 juillet 1988. Le Congrès aura lieu sur le campus de l'Université de la Colombie-britannique et des logements seront disponibles dans les résidences de l'Université et dans les hôtels de la ville.

Le Dr. G. G. E. Scudder a été nommé Président et Secrétaire Général du Congrès par le bureau de direction de la Société Entomologique du Canada. Les autres membres du comité d'organisation sont G. E. Ball, K. G. Davey, S. Loschiavo, J. N. McNeil et I. M. Smith.

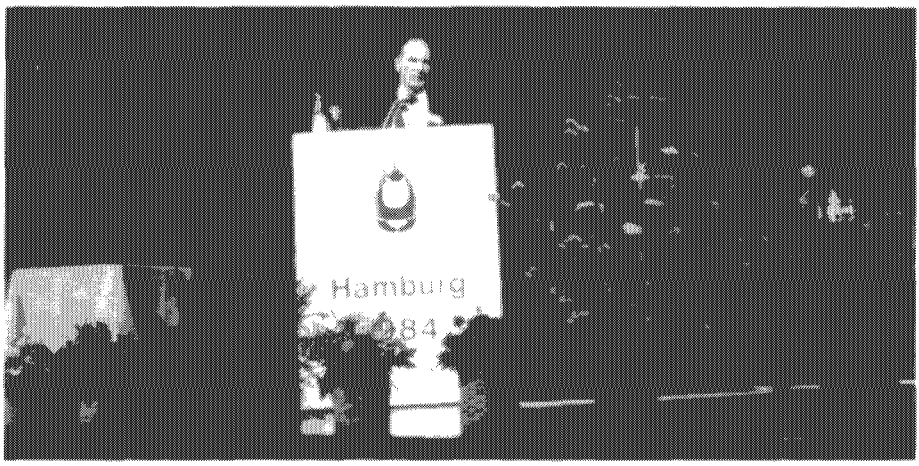
Le Symbole du XVIII^{e} Congrès International

Tout entomologiste (membre ou non de la Société Entomologique du Canada) et toute personne intéressée sont invités à soumettre une esquisse qui pourrait être le symbole pour le XVIII^{e} Congrès. Celle-ci devra inclure le nom, le nombre (18^{e}), les dates et le lieu du Congrès. La description écrite de l'esquisse devra être inclue avec le dessin. Le symbole choisi sera utilisé sur les annonces, la correspondance et les publications touchant le Congrès. Les soumissions devront être envoyées avant le 15 juin 1985 au: Dr. G. G. E. Scudder, Secrétaire général du XVIII^{e} Congrès International d'Entomologie, c/o Department of Zoology, University of British Columbia, Vancouver, B.C. V6T 2A9.

XVIII International Congress of Entomology Comes to Canada in 1988

At the 33rd Annual General Meeting, held at Regina, Saskatchewan, 4 October 1983, a formal motion was presented and ratified that "the President of ESC approach the Permanent Committee of the International Congresses of Entomology to extend an invitation to hold the XVIII Congress of Entomology in Canada in 1988". Contacts with Dr. Douglas F. Waterhouse, Chairman, Council for the International Congresses of Entomology, and Dr. Lawrence A. Mound, Secretary of Council, were made on 17 and 25 October 1983 and we were advised to submit a formal invitation to Council at the XVII International Congress of Entomology to be held at Hamburg, Federal Republic of Germany, 20-26 August 1984.

In November, 1983, the ESC Executive organized a Steering Committee consisting of Drs. G. G. E. Scudder, Chairman; G. E. Ball; S. R. Loschiavo; I. M. Smith, K. G. Davey; and J. McNeil to: (1) Select a site for the 1988 Congress and; (2) prepare a formal invitation for presentation to Council at Hamburg, Germany, August 1984. After one meeting and additional consultation, the Steering Committee selected the University of British Columbia, Vancouver, as the site for the XVIII Congress, 3-9 July 1988, and the formal invitation was prepared.



ESC President Ray F. Morris extends our invitation to delegates at the Congress in Hamburg, Federal Republic of Germany, to attend the XVIII International Congress of Entomology in Vancouver in 1988.

On Tuesday, 21 August, Dr. I. M. Smith, Mr. Jim Willis, B.C. Tourism, London, England, and I met with Council at Hamburg and presented the ESC invitation. We were competing with invitations from Yugoslavia, The Philippines and Israel. On Wednesday evening, 22 August, from 7:00 to 9:30 p.m. the Canadian Vice-Consul at Hamburg, Ms. Dianne Horton, and B.C. Tourism entertained members of Council and their guests with a luncheon and visual slide presentation on Vancouver and beautiful British Columbia. On Thursday, 23 August, the Council awarded the 1988 Congress to the ESC and Canada.

On Friday, 24 August, at the closing plenary session your President was privileged to speak to the assembled members attending the closing plenary session and invite them to attend the XVIII International Congress at Vancouver, 3-9 July 1988.

At the ESC Governing Board meeting held at St. Andrews, 29-30 September, Dr. G. G. E. Scudder was appointed President and Secretary-General of the XVIII International Congress of Entomology, and members of the original Steering Committee were asked to serve as the Organizing Committee for the Congress.

Ray F. Morris,
Past President

A NEW INTERNATIONAL AWARD

The Council for the International Congresses of Entomology recently approved a new "Distinguished International Award in Morphology and Embryology," to be presented to an outstanding morphologist or embryologist at each future Congress of Entomology.

The award was announced in the opening plenary session of the XVII International Congress of Entomology in Hamburg on August 20, 1984, by the Chairman of the Council, Dr. Douglas F. Waterhouse and was published in the Daily Bulletins of the Congress on August 20, 21, 22, and 24, 1984.

The award has been sponsored by the International Journal of Insect Morphology & Embryology (IJIME) and its publisher the Pergamon Press, Oxford, England and will consist of $U.S. 1,500 in cash and a gold medal.

The Selection Committee shall consist of 3 members of the Editorial Board of the IJIME, one representative of the Council, and the Chairperson (organizer) of the Morphology and Embryology section (or other appropriate section) of the immediate past Congress. The Editor-in-Chief of the IJIME shall be the Chairperson of the Selection Committee.

Two awards will be presented at the next Congress in Vancouver, Canada: one retroactively for 1984 and the other for 1988. Full details of the selection procedures will be published in the December 1984 issue of the International Journal of Insect Morphology & Embryology and subsequently in other journals.

For additional information regarding this award, one may call (201-932-9873/9459) or write to A. P. Gupta, Editor-in-Chief, International Journal of Insect Morphology & Embryology, Department of Entomology & Economic Zoology, Rutgers University, New Brunswick, NJ 08903, U.S.A.

PUBLICATIONS:

The Canadian Entomologist: Manuscripts Received

Margaret McBride, Managing Editor, assembled this table of numbers of manuscripts recieved. (The table is reprinted here, since several headings appearing in the June 1984 Bulletin were incorrect—*Editor*).

Manuscripts received January 1977 to March 1984

	1977	1978	1979	1980	1981	1982	1983	Mean	S.D.	1984
Jan.	12	23	21	19	13	19	21	18.29	3.88	21
Feb.	18	19	15	18	27	30	24	21.57	5.10	18
Mar.	21	28	25	24	22	20	26	23.71	2.66	27
Apr.	15	15	25	16	19	17	21	18.29	3.41	
May	16	23	15	11	16	27	19	18.14	4.97	
June	17	15	16	10	20	33	31	20.29	7.92	
July	4	15	15	24	4	17	13	13.14	6.62	
Aug.	21	15	23	12	13	14	30	18.29	6.13	
Sept.	17	18	13	16	26	16	14	17.14	3.94	
Oct.	18	13	20	17	10	17	10	15.00	3.70	
Nov.	19	20	16	15	18	23	14	17.85	2.90	
Dec.	17	10	10	14	16	15	16	14.00	2.67	
Totals	195	214	214	196	204	248	239			

Note: Mail strike 16 July through 12 August 1981.

D. C. Eidt
Former Scientific Editor

Book Reviews

Ananthakrishnan, T. N. 1984. *Bioecology of Thrips.* Indira Publishing House, Oak Park, Mich., viii + 233 pp., 39 text figures, 20 tables, 30 plates + frontispiece, 4 appendices, subject and author indices, cloth, $U.S. 55.00.

Professor Ananthakrishnan is Director of the Entomology Research Institute, Loyola College, Madras, India, a former (1977-1980) Director of the Zoological Survey of India and the author or co-author of over 300 publications on Indian Thysanoptera including four other books and an article in the *Annual Review of Entomology* (1979 24: 159-183). He and his students have described many of the thrips of India (as of 1980, 647 species in 248 genera were known from there) and have obtained extensive information on the life history of many of them. Thus, he is eminently qualified to write a book on the ecology of thrips.

Ananthakrishnan has organized the contents of the book into 10 chapters concerning evolution, phylogeny, higher classification and distribution (chapter 1), ecological diversity (2), community relations (3), reproduction and life history (4), impact on agriculture (5), natural control agents (6), gall formation (7), fungus feeding (8), pollination (9), and other interactions with plants. Extraction, sampling and rearing techniques (appendix I) and lists of the host plants and distribution of the world's pest thrips (there are 93) (II), and of the genera (III) and species (IV) mentioned in the book are treated in his appendices.

The book is strongly bound, is printed on good quality paper and considers the literature up to and including 1983 (it has 442 references). It also contains much new and fascinating information on a variety of tropical species not available to Trevor Lewis in 1972 when he was writing the only previous book on thrips ecology (1973. *Thrips. Their Biology, Ecology and Economic Importance.* Academic Press—reviewed in *Bull. Ent. Soc. Can.* 6[2]: 58-59 [1974]). Note-worthy is new data on ovovivipary and vivipary, sex-limited polymorphism and feeding in mycetophagous thrips, ecological interactions in plant galls, phenology of flower-inhabiting species, and species-packing. The photographs in the book are also excellent.

In spite of these good qualities, *Bioecology of Thrips* compares unfavourably with Lewis' book in almost every respect, principally because of a total inattention to detail during its preparation. The writing is ponderous and imprecise throughout. For example, the last paragraph of Chapter 10 begins (p. 155): "Though, not much work has been effectively carried out to assess the chemical characteristics of host plants which would regulate the feeding and eventually the gall-inducing behaviour of thrips, it is not impossible to assume the effective functioning of the phyto-chemically defined host relations, since a majority of the adaptive radiational patterns as evident in plant feeding and cecidogenous thrips are restricted within the limits of systematically related host plant groups." This sentence is all too typical and makes for tedious reading in spite of the intrinsic interest (at least to me) of the book's contents.

In addition, the text is replete with typographical errors. Measurements of size, weight and temperature are presented in either metric or imperial units, and old and new scientific names are used with impunity for the same species—both indicating no interest on Ananthakrishnan's part in making the book consistent. And, in Chapter 4, he often uses "species" for "specimens" in both text and figure captions (Fig. 7) making for much confusion in understanding.

There are errors in fact as well: it is the *left* mandible of thrips *not* the right that is functional (p. 2); female phlaeothripids *do* have a functional, though highly reduced ovipositor (pp. 1, 39, 55); *no* female terebrant, to my knowledge, has a sac-like ovipositor (p. 55), and members of the genus *Aeolothrips do* have antennal sense cones (multiporous Chemosensilla) although not on segments 3 and 4 (p. 4).

Ananthakrishnan also sometimes misrepresents the statements of other authors. For example, I (Heming, 1980) did *not show* "that as the left mandible becomes progressively adapted for punching, its base narrowed and its primary articulations with the head capsules [*sic*] were lost so that it became [*sic*] more flexibly joined to the head so that it could protract and retract." (p. 2). Rather, I suggested this as one possible evolutionary scenario for the origin of the mandibular stylet in thrips. Neither did I (Heming, 1970) observe "longitudinally arranged sperm bundles or *spermatophores*" (his word) in the testicular rudiments of male pupae II of *Haplothrips verbasci* (p. 45). Other thysanopterists may find similar examples.

Ananthakrishnan was incredibly careless in preparing his figures and tables (or in checking those constructed by others). Although he numbers his text-figures and plates consecutively from the front of the book (except for the first text figure in Chapter 8 which he numbers 2), his tables are treated separately in each chapter except in 3 and 4 where they too are numbered consecutively. Thus, it is often impossible to refer to the correct table when reading the book. Many of his graphs (Figs. 4, 11, 12, 16, 18) do not have their separate curves tagged; others (Figs. 19, 20) have no units indicated on their axes, and one (his line drawing below plate 27) has no explanation whatsoever. Also, the captions for some illustrations and tables are incorrect (e.g., in Fig. 9 it is post-"emergence" not post-"embryonic" development that is figured) or do not contain enough information to explain the figure or table fully (Figs. 13, 15, 18, 21; Chapter 4, tables 7-10; Chapter 6, tables 1 and 2). Furthermore, many of his tables comparing growth rate and fecundity among several species (Chapter 4, tables 4, 5-10; Chapter 6, table 2) lack information on temperature and/or relative humidity so their contents have little use. Finally, he provides no illustrations of the extracting tools described in appendix I when a verbal description of them is insufficient for visualization (Lewis provides these in abundance).

Two other critical weaknesses in the book are a total absence of quantitative analysis (I searched in vain for standard errors, standard deviations, ranges, p-values, etc.) and little apparent understanding or use of modern ecological theory (mating strategies, competition, speciation, island biogeography, population dynamics, etc.) even though the author included much information on thrips pertinent to these theories and cited some of the right authors (Andrewartha, Futuyma, Hamilton, Jansen, MacArthur, Price, Simberloff, Southwood, Whittaker, etc.).

For these reasons I cannot strongly recommend this book to those interested in the ecology of thrips. Lewis' treatise is outstanding in most of the areas covered by Ananthakrishnan, has none of the weaknesses mentioned above and, at $24.20 (at least in 1974), is a steal.

B. S. Heming
Department of Entomology
University of Alberta
Edmonton, Alberta

Let us take you on an arctic adventure

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

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

The book will come to you as a handsome hardcover edition of 608 pages, with 114 figures, 109 tables and 2491 references.

We also invite you to order the companion bibliography. This softcover 125 page bibliography lists alphabetically 1382 papers published through mid-1979 that deal with terrestrial arthropods north of the tree line in Canada, Alaska and Greenland. This useful supplement to the book "Arctic Arthropods" adds references not cited there and also indexes the literature by subsidiary authors, geographical areas, taxa and subjects.

ORDER FORM

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ARCTIC ARTHROPODS	$35.00
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Postal money orders or cheques should be made payable in Canadian funds or equivalent, to the Entomological Society of Canada

Mail to: Entomological Society of Canada
1320 Carling Avenue
Ottawa, Canada, K1Z 7K9

Name .....

Address .....

Hoy, M. A., Cunningham, G. L. and Knutson, L. Editors. 1983. *Biological Control of Pests by Mites*. Special publication no. 3304. Division of Agriculture and Natural Resources, Agricultural Experiment Station, University of California, Berkeley, California. 185 pp. $U.S. 15.00.

This paper-bound volume represents a serious attempt to explore the possibility of using various mite groups as effective biological control agents against insect and mite pests of agricultural, medical and veterinary importance. Through 22 papers presented in 1982 at a "think tank" conference held at the University of California, Berkeley, 24 contributors have evaluated the existing data on the subject and provided recommendations for future research. The book is divided into three sections: attributes of effective biological control agents, current status and potential of mites as biological control agents, and research needs in biological control. The usefulness of the book has been enhanced by the inclusion of a combined generic and subject index.

The conference organizers and editors have done a good job in planning and providing a synthesis of fragmentary data on various mite and insect groups, as presented by acarologists with divergent approaches and research specializations. The real limitation in this field is the lack of an adequate data base except for such groups as Phytoseiidae (as documented by J. A. McMurty). One contribution (W. C. Welbourn) has provided comprehensive tabular summaries of host prey records for Trombidioid, Erthraeoid mites, whereas others (R. L. Smiley and L. Knutson) have given a summary of available data on families and genera of mites that are parasitic, predaceous, or otherwise associated with invertebrates; or on leaf-mining insects (G. C. Eickwort). Some articles discuss new ideas and concepts, such as the potential for the use of mites in biological control including a modified concept of "parasitoids" (E. E. Lindquist); and another on genetic improvement of mites as biological agents (M. A. Hoy). Section III of this book will be helpful to those who wish to develop projects on biological control of arthropod pests involving mites, because recommendations and guidelines contained in it are both basic and practical.

Despite this very worthwhile exercise, large-scale use of mites (except the family Phytoseiidae) as biological control agents is still at a very exploratory stage.

R. N. Sinha
Agriculture Canada
Research Station
Winnipeg, Manitoba

Book Notices

Collins, Michael M. 1984. *Genetics and ecology of a hybrid zone in* Hyalophora *(Lepidoptera: Saturniidae)*. University of California Publns. in Entomology, Vol. 104. xii + 93 pp. University of California Press, 2120 Berkeley Way, Berkeley CA 94720. $U.S. 11.50.

"Zones of contact between populations of recognizably different organisms can be seen as experiments in nature in which barriers to reproduction and selective processes affecting the survival of given genotypes are operationally 'tested'." The author applies a series of critical tests to caged specimens of *Hyalophora euryalus* and *H. gloveri*, which hybridize on Monitor Pass in the Sierra Nevada of California. The two species are otherwise allopatric, though individuals from allopatric parts of their respective ranges mate and produce fertile offspring in captivity. Fitness of progeny resulting from many experimental crosses was measured, both in the hybrid zone and in the allopatric areas. The inferred genetic and ecological factors maintaining phenotypic structure in the hybrid zone are listed and discussed.

C. D. Dondale
Biosystematics Research Institute
Ottawa, Ontario

Larochelle, André. 1984. *Les punaises terrestres (Hétéroptères: Geocorises) du Québec*. Fabreries, Supplément 3. pp. 1-513. Association des Entomologistes Amateurs du Québec, C.P. 52, Sillery, Québec G1T 2P7. Prix $15.00 (membre de l'AEAQ), $20.00 (non-membre). Ajouter $2.00 par copie pour les frais de poste et de manutention.

Ce supplément traite des 488 espèces de punaises terrestres du Québec. La table des matières inclue morphologie externe, liste des espèces avec synonymie et noms vernaculaires, tableaux de détermination des nymphes et des adultes au genres et aux espèces, liste des plantes nourricières, une glossaire des termes et leurs équivalents anglais, bibliographie d'environ 600 publications. Il y a plus de mille dessins qu'illustrent cette publication.

André Larochelle
College Bourget
Rigaud, Québec

Ravlin, F. William, and Frederick W. Stehr. 1984. *Revision of the genus* Archytas *(Diptera: Tachinidae) for America north of Mexico.* Miscellaneous Publications of the Entomological Society of America, 4603 Calvert Road, College Park, Maryland 20740. $U.S. 4.50 (members), $7.50 (non-members).

Tachinids of the genus *Archytas*, particularly females, have "plagued taxonomists for years" with their unidentifiability. Assessment of characters used in the past, together with new characters from female genitalia, are used to redefine the tribe Dejeaniini, the genus *Archytas*, the subgenera *Archytas* and *Nemochaeta*, and 13 species. One species is new, and three species names are newly synonymized. Larvae of 10 species are described. This work should stimulate similar approaches in other groups.

C.D. Dondale
Biosystematics Research Institute
Ottawa, Ontario

Spieth, Herman T. 1984. *Courtship behavior of the Hawaiian picture-winged* Drosophila. University of California Pubins. in Entomology, Vol. 103. vii + 92 pp. University of California Press, 2120 Berkeley Way, Berkeley CA 94720. $U.S. 9.50.

Behavioral data continue to yield rich results in *Drosophila*. Added to the vast array of available characters from structure, function, and heredity, they permit one of the best classifications for any genus of insects. Spieth here details his field and laboratory observations on the large (106 described species) species group called picture-winged. Males, in contrast to those of continental groups, engage in sexual behavior in vegetation away from feeding sites. Courtship is correspondingly complex, and this provides the females that enter the leks established by males with a broad gamut of stimuli on which to discriminate mates.

C.D. Dondale
Biosystematics Research Institute
Ottawa, Ontario

Whitehead, D.L. and W.S. Bowers, Editors. 1983. *Natural Products for Innovative Pest Management* Pergamon Press, New York, xix + 586 pp. $U.S. 140.00.

This book is the second in the series *Current Themes in Tropical Science* and contains papers presented at two different meetings held at the International Centre of Insect Physiology and Ecology, in Nairobi, Kenya in 1979 and 1980. The book is divided into four parts dealing with (i) chemistry and mode of action of natural products active against pests (ii) the control of tropical pests and vectors of economic importance (iii) requirements for pesticide production and utilisation, and (iv) the need for trained scientists and technologists (in tropical countries). The individual chapters vary from review articles to specific studies dealing with natural products for insect control. The discussions that followed each paper have been included in the text. These frequently underline that while considerable progress has been made, there is still a long way to go in implementing pest management programmes, especially in third world countries.

The book contains much useful information but its price would exclude it from most personal libraries. I would recommend that interested researchers and students request their institutional library acquire a copy of this text.

Jeremy McNeil
Département de biologie
Université Laval
Québec

Worthing, C. R., Editor. Walker, S. B., Assistant Editor. 1983. *The Pesticide Manual—A World Compendium, 7th Edition.* British Crop Protection Council, Lavenham Press Ltd., Suffolk. 700 pp. $U.S. 65.00.

This compendium will be a useful volume for anyone having to answer questions from the general public or from other professionals concerning pesticides. It lists the compounds, each on a separate page or pages, in alphabetical order by common name, but has several indexes cross referencing all the various categories of names, thus making information on any material easy to locate. Each entry includes the chemical formula of the compound and sections on its nomenclature and development, its properties, uses, toxicology, formulations, and analysis. It could save considerable time for anyone possessing it since it serves as a single source of basic or introductory information on about 600 materials used to control such organisms as weeds, plant diseases, insects and other pests.

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New Books and Publications

Boll Weevil Mass Rearing Technology. P. P. Sikorowski, J. G. Griffin, J. Roberson, and O. H. Lindig. University Press of Mississippi. Jackson, 1984. 172 pp. $U.S. 15.00.

Butterflies East of the Great Plains. An Illustrated Natural History. Paul A. Opler and George A. Krizek. Johns Hopkins University Press, Baltimore, Md., 1984. xvii + 294 pp. $U.S. 49.50.

Catalogue of Herbarium of William W. Judd. W. W. Judd. Phelps Publishing Co., 87 Bruce Street, London, Ontario N6C 1G7, 1984. $5.00.

A Comparison of the U.S. (GYPCHECK) and U.S.S.R. (VIRIN-ENSh) Preparations of the Nuclear Polyhedrosis Virus of the Gypsy Moth, Lymantria dispar. C. M. Ignoffo, M. E. Martignoni, and J. L. Vaughn, Eds. American Society for Microbiology, Washington, D.C., 1984. 54 pp. Free.

The Dawn of Animal Life. A Biohistorical Study. Martin F. Flaessner. Cambridge University Press, New York, 1984. xii + 244 pp. $U.S. 49.50. Cambridge Earth Sciences Series.

Entomography, an Annual Review for Biosystematics. Thomas D. Eichlin and Charles S. Papp, Eds. Entomography Publications, Sacramento, Calif., 1982. viii + 445 pp. Volume 1.

Entomology: A Catalog of Instructional Materials. C. W. Rutschky, Ed. ESA Publication, 1983, 480 pp. $U.S. 16.00 (ESA members); $U.S. 19.20 (non-members).

Entomology: A Guide to Information Sources. Pamela Gilbert and Chris J. Hamilton. Mansell Publishing Ltd., Bronx, New York, 1983. vi + 237 pp. $U.S. 29.00.

Flies of the Nearctic Region, Volume VIII, Cyclorrhapha II (Schizophora: Calyptratae), Part 2, Number 2, Anthomyiidae, G. C. D. Griffiths, 1983, pp. 161-288; *Number 3, Anthomyiidae,* G. C. D. Griffiths, 1984, pp. 289-408. E. Schweizerbartische Verlagsbuchhandlung, Stuttgart.

Forest Entomology. Ecology and Management. Robert N. Coulson and John A. Witter. John Wiley & Sons, New York, 1984. x + 669 pp. $U.S. 37.50.

Insect Biology. A Textbook of Entomology. Howard E. Evans. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1984. x + 436 pp. $U.S. 32.95.

Insect Neurochemistry and Neurophysiology. A. B. Bořkovec and T. D. Kelly, Eds. Plenum, New York, 1984. xiv + 523 pp. $U.S. 69.50. From a conference, College Park, Maryland, August 1983.

Insect Pest Control with Special Reference to African Agriculture. R. Kumar. Edward Arnold (Publishers). 1984. 298 pp. $U.S. 20.00.

Insecticides for Control of the Spruce Budworm. Bruce A. Montgomery, et al. CANUSA Publications, Broomall, Penn., 1984. 29 pp. Free. Agriculture Handbook No. 615.

Insects Harmful to Forest Trees. R. Martineau. Multiscience Publications Ltd., Montreal, 1984. 288 pp. $49.95.

Insects of Australia. John Goode. Angus & Robertson Publishers, London, 1984. 260 pp. £6.95.

Insects on Plants. Community Patterns and Mechanisms. D. R. Strong, J. H. Lawton, and R. Southwood. Harvard University Press, Cambridge, Mass., 1984. vi + 313 pp. $U.S. 35.00. Paper $U.S. 18.95.

Mathematical Ecology. S. A. Levin and T. G. Hallam, Eds. Springer-Verlag, New York, 1984. 513 pp. Paper. $U.S. 24.50. Lecture Notes in Biomathematics, vol. 54. From a course, Miramare-Trieste, Italy, November 1982.

A New Ecology. Novel Approaches to Interactive Systems. Peter W. Price, C. N. Slobodchikoff, and William S. Gaud, Eds. John Wiley & Sons, New York, 1984. x + 515 pp. $U.S. 59.95.

New Phenology. Elements of Mathematical Forecasting in Ecology. Alexander S. Podolsky. John Wiley & Sons, Inc., New York, 1984. xiii + 504 pp. $U.S. 64.95.

Photoperiodic Regulation of Insect and Molluscan Hormones. Pitman, London, 1984 (U.S. distributor, CIBA Pharmaceutical Co., West Caldwell, N.J.). viii + 298 pp. $35.00. Ciba Foundation Symposium 104. From a symposium, London, July 1983.

Plant and Insect Nematodes. William R. Nickle, Ed. Dekker, New York, 1984. xvi + 925 pp. $U.S. 145.00.

Proceedings: New and Improved Techniques for Monitoring and Evaluating Spruce and Budworm Populations. CANUSA Publications, Broomall, Penn., 1984. 71 pp. Free. General Technical Report Ne-88.

Regional Evaluation of B. t. *for Spruce Budworm Control.* D. G. Grimble and O. N. Morris. CANUSA Publications, Broomall, Penn., 1983. 9 pp. Free. Agriculture Information Bulletin No. 458.

Revision of the Genus Archytas *(Diptera: Tachinidae) for America North of Mexico.* F. William Ravlina and Frederick W. Stehr. Entomological Society of America, College Park, Md., 1984. 60 pp. $U.S. 4.50 (ESA members); $U.S. 7.50 (non-members). Miscellaneous Publications of the E.S.A., No. 58.

A Revision of the Sawfly Family Orussidae for North and Central America (Hymenoptera: Symphyta, Orussidae). Woodrow W. Middlekauff. University of California Press, Berkeley, 1983. x + 46 pp. $U.S. 8.75. University of California Publications in Entomology, Volume 101.

Soil Mites of the World. Volume I: Primitive Orbitids of the Palaearctic Region. J. Balogh and S. Mahunka. Elsevier, New York, 1983. 370 pp. $U.S. 106.50.

South American Species of the Subgenus Anisotarsus *Chaudoir (Genus* Notiobia *Petry: Carabidae: Coleoptera).* Part I: Taxonomy and Natural History. Gerald R. Noonan. Milwaukee Public Museum Press, Milwaukee, Wis., 1981. 84 pp. $U.S. 5.75. Contributions in Biology and Geology, No. 44.

Techniques for Measuring Early-Larval Dispersal of Spruce and Jack Pine Budworms. Daniel T. Jennings, et al. CANUSA Publications, Broomall, Penn., 1984. 33 pp. Free. Agriculture Handbook No. 614.

Termitologia. Tome II. Foundation des Sociétés Contruction. Pierre-P. Grassé. Masson, Paris, 1984. ix + 613 pp.

Update on Publications

The following ESC Memoir is now available:

No. 129: *A Revision of the Genus* Aleochara *Gravenhorst of America North of Mexico (Coleoptera: Staphylinidae, Aleocharinae).* Jan Klimaszewski. 1984. 211 pp. $14.75 (ESC members $10.75).

Experimental and Applied Acarology will be of interest to acarologists; entomologists (including medical entomologists); pest regulators; reseachers in the fields of crop protection (chemical, biological and integrated control), post-harvest and storage problems; agricultural and soil environmentalists; soil microbiologists; policy makers; pesticide manufacturers. It will appear quarterly, with four issues to each volume. The first issue is expected late 1984 (subscription year 1985). The subscription rate is $U.S. 77.75/Dfl. 202.00, including postage. Authors are invited to submit manuscripts in triplicate, to the Editorial Secretariat, "Experimental and Applied Acarology", P.O. Box 330, 1000 AH Amsterdam, The Netherlands.

RETIREMENTS

Douglas M. Davies

Douglas Davies retired July 1984 from McMaster University after being on staff at the Biology Department for 34 years. Doug was born in Toronto and received his B.A. (1942) and Ph.D. (1949) from the Department of Zoology, University of Toronto. During 1942-45 he served as meteorological officer with the Royal Canadian Air Force. During 1945-51 he was employed in the Department of Parasitology, Ontario Research Foundation, Toronto. His long tenure at McMaster began as lecturer in zoology (1950-51); subsequently, he became Assistant Professor (1951-57), Associate Professor (1957-63) and Professor (1963-84).

Doug's long devotion to teaching and research in entomology has touched the lives of many students who have passed through his lecture room and laboratory. At the graduate level he has supervised 10 M.Sc. and 10 Ph.D. students and also 6 postdoctoral fellows, all in various aspects of entomology, involving primarily Simuliidae and Tabanidae. His primary interest in behavioural ecology and taxonomy has taken him over most of Canada and several European and Southeast Asian countries collecting black flies and tabanids. He and his students have published over 90 scientific papers, and currently he is preparing a monograph on black flies of Sri Lanka. He has held offices in several scientific societies, having been President of the Entomological Society of Ontario, Editor of its Journal, and more recently Secretary of the Entomological Society of Canada and Editor of its Bulletin. In 1981 he was made a Fellow of the Entomological Society of Canada. He continues research at McMaster as Professor Emeritus and with his wife participates in activities of worthy charitable organizations.

We wish Doug and Sheila a long and happy retirement.

Victor I. Golini
Biology Department
McMaster University
Hamilton, Ontario

Klaus H. Rothfels

Klaus Rothfels retired in July 1984 after 37 years on staff in the Department of Botany, University of Toronto. His studies began in his native Germany and continued in England and Scotland and later in Canada where he obtained his B.A. (1944) and Ph.D. (1948) from the University of Toronto. He began his career as Lecturer, 1947-1950, continuing subsequently as Assistant Professor, 1950-1957, Associate Professor, 1957-1962, and Professor, 1962-1984.

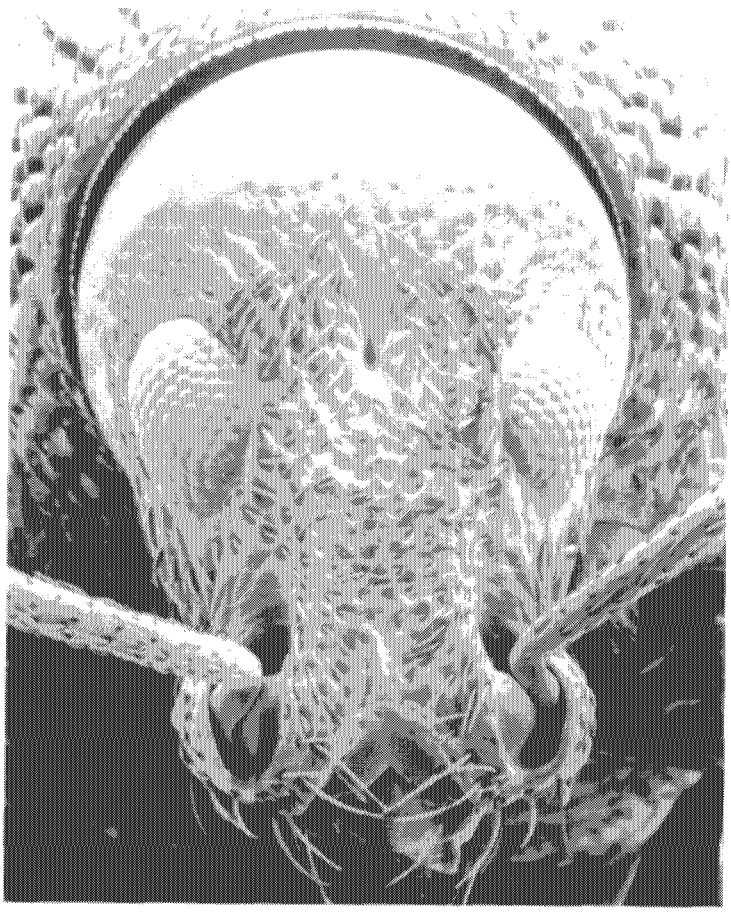
His specialization in genetics has led him over the years to study systems of chromosomes in several groups of plants and animals. Following his doctoral dissertation on translocations in natural populations of grasshoppers (Acrididae), he and his students investigated chromosomes of other groups of insects in the families Chrysomelidae, Coccinellidae, Chironomidae and Simuliidae, as well as those of vertebrates including fish, amphibians, birds, mice, monkeys and man. However, his contribution to entomology has centered on speciation studies of blackflies which began in the early 1950's when investigations of larval polytene chromosomes revealed that classical morphospecies usually consisted of complexes of sibling species. Use of the banding pattern of polytene chromosomes as a diagnostic tool has given taxonomists a firm basis for describing certain new species of blackflies and has helped to clarify the phylogeny among several species groups in the family.

His enthusiasm for research and teaching has attracted over the years a number of students and post doctoral fellows to his laboratory, graduating to date 23 M.Sc.'s and 24 Ph.D.'s. Studies from his laboratory have resulted in over 80 scientific publications, of which over 50 are on insects, including 35 on blackflies. Being avid lovers of nature, he and his students have collected insects for cytological studies over a wide area of North and Central America, Europe, Africa and Australia, as well as gratefully evaluating collections of blackflies sent for study by fellow entomologists from other parts of the world. Klaus continues his research as Professor Emeritus, currently supervising one additional M.Sc. and three Ph.D. students; he expects to continue research with other prospective students who may wish to study in his laboratory.

He has managed to reconcile a career as a dedicated scientist and teacher with the parental care given to his eight children. He is currently living on Toronto Island with his wife and the three youngest children. We wish Klaus and Elizabeth a happy and prosperous retirement.

Victor I. Golini
Department of Biology
McMaster University
Hamilton, Ontario

FEATURE PHOTOGRAPH



Close encounter with a strawberry root weevil (photograph courtesy of G. Braybrook, Department of Entomology, University of Alberta).

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Bulletin Deadline

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