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GUEST EDITORIAL

The Entomological Society of Canada and the Biological Council of Canada

by
G. B. Wiggins*

During the years that I have participated in deliberations of the ESC Governing Board, and no doubt long before, the question has arisen regularly: "What does the ESC derive from its membership in BCC?" Indeed, the ESC severed its connection with BCC some years ago, but rejoined in 1977. That is a fair question, but the fact that it is raised so often indicates that the response given is either not convincing or not communicated to the members who raised it. At the suggestion of some of the members of the Governing Board, I will undertake here to provide a response that seems reasonable, at least to members of the ESC Executive.

At the outset, it will be understood that the BCC is an organization of societies and not of individuals. The constituent societies are: The Canadian Botanical Association, The Canadian Phytopathological Society, The Canadian Society of Plant Physiologists, Canadian Society of Zoologists, The Genetics Society of Canada, Entomological Society of Canada, and Canadian Council of University Biology Chairmen. Each constituent society is represented on the BCC Executive Board by its President, or Vice-President or President-Elect, and is entitled to two additional representatives and votes on the Council at large; hence each constituent is entitled to three votes at Council meetings. Officers are elected by the Council: President, 2 Vice-Presidents, Treasurer, Secretary and 2 Members-at-large.

The purpose of the Biological Council of Canada, from its constitution, is "... to provide an organization through which member societies can co-operate or take joint action in assuming the role and major function of initiating policy that affects biology in Canada." Major issues addressed can be seen from the list of 13 BCC briefs (listed in the Publications section of this Bulletin issue). Currently the Council is concerned with establishing an Advisory Committee on Biology in NSERC, and with developing a rational and comprehensive approach to the distribution of federal funding for support of field stations in Canada. Recently the BCC has offered constructive proposals on a number of significant deficiencies in the management and staffing of the federal government's own biological laboratories. A continuing concern is representation of biology on the central council of NSERC. After a long and vigorous campaign by successive BCC presidents, a second biologist was recently appointed to the central Council; but 2 of 22 Council members is still a disproportionately small representation from biology, given the breadth of our science in the community served by NSERC. All of the matters taken up by the BCC are significant to development of biology in Canada. The presidency of BCC is a demanding job, and incumbents have given unstintingly of their time. The current president, Dr. G.R. South of Memorial University, continues these efforts to achieve larger objectives for biology (*see p. 148 — Ed.*).

An entomological component or goal can be identified in every one of the issues addressed in BCC briefs; but what the ESC really gains by participation in BCC is full and active membership in the Canadian community of biological science, which is where a large number of ESC members believe the Society should be. If the ESC were not a member of BCC, could it find resources in voluntary time to articulate independently positions on these issues of importance to the national biological community? Entomologists are biologists, and they share with all other biologists concern for standards of excellence in their profession, and for rational management of the renewable plant and animal resources of the country; indeed biological societies have a responsibility to speak out on these matters.

Even so, discussions about the merit of BCC membership frequently convey a sense of *them* and *us* — the BCC and the ESC. I would urge the view that the BCC *is us:* and that the Entomological Society of Canada make every effort, through its BCC representatives, to ensure that among the issues taken up by the Council, those of concern to the ESC are included. Few other Canadian biological societies have become as active in matters of science policy as the ESC itself; and by treating membership in the BCC as another active arm of science policy, the ESC could be more effective in its entomological objectives and also in its role as a significant force in the biological community of Canada.

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A cogent argument could be made that, if a concerted organization did not already exist for Canadian biology, it should be created. Fortunately, those organizational problems are long past, and the BCC is able to respond to national problems and deficiencies where biological policy is concerned.

To further consolidate this sense of unity among Canada's biologists, the BCC is organizing the first Canadian Congress of Biology, to be held June 23-29, 1985 at the University of Western Ontario, London. For part of this week constituent societies will conduct their own scientific programmes, and for the remainder, plenary assemblies and joint symposia are planned. The Congress will be a unique and important occasion for biology in this country, and members of the Entomological Society of Canada are urged to make plans to attend. Details will be announced in the Bulletin as they become available.

THE PRESIDENT'S REPORT

33rd Annual Meeting of the Entomological Society of Canada Regina, Saskatchewan, October 1983

Today, in the process of informing you about the position of the Entomological Society of Canada and the highlights of activities of the Governing Board and its committees during the past year, I propose to speak about the Presidency in relation to continuity of direction of policy; about problems old and new; about initiatives and triumphs; and about some of the internal affairs of the Society. I hope that I might enlighten you and also offer something for consideration by those who follow me.

The Presidency

I begin with the Presidency because this is a moderately important office in the Society, and much of what happens (or does not) is the result of the President's guidance. At one time, the Presidency of a scientific society was essentially an honorific position. A person honored by election to this office would preside at the next annual meeting, and give some inspirational direction in the form of a stimulating address about his particular scientific interest, or better still, an address would be given about some general theme—but I think that, above all, something inspiring was hoped for and expected by those who elected the person to the Presidency.

Continuity in policy was not required, except at a general housekeeping level. Such tasks were a principal concern of the Secretary and Treasurer, or a Secretary-Treasurer. Individuals recognized nomination to the Presidency as a comfortable honor, perhaps as the capstone of a distinguished career, or as a stepping-stone to further honors and promotions.

It is still an honor to be asked to serve as President, but not a comfortable one because its acceptance entails an extended period of activity on behalf of the Society in particular, and on behalf of entomology, in general. This activity has the effect of hindering one's own practice in the chosen field of endeavor and special interest.

Expectations of the members have changed. Inspirational messages about science are left to the gold medallists, at least in this Society. (I note, however, an exception, in the form of Dr. G. B. Wiggins' masterful presidential address delivered last year during the opening ceremonies of the joint meetings of ESA-ESC-ESO, in Toronto. I submit, however, that this was a special occasion to which he rose magnificently, and made us all proud to be members of the Entomological Society of Canada). The President, as chief executive of the Board, is too busy with Board activities to have much time for delivery of anything except a litany of concerns for the future and a statement about what had been accomplished during the past year by Board-related, or Board-directed activities.

Some 15 years ago, it became clear to members of this Society that entomology was faring not too well in Canada, as evidenced principally by a waning number of positions in the Federal service, and little in the way of increase in other sectors. The Presidents and Governing Boards decided that corrective action would have to be taken.

Such action required formulation of policy that would give sustained direction to attempts to improve the lot of entomology in Canada. Over the intervening years, successive Boards have, in fact, initiated or encouraged action appropriate to this goal. So, it is incumbent upon Presidents to become familiar with the overall thrust of the Society, and to continue along the lines that have been staked out, or to suggest corrective adjustments, as seem appropriate under changed circumstances.

The point to note is that the Presidency is now the office of chief executive, and the person who occupies that office must assume responsibility for ensuring continuity of action. It is vital that this point be appreciated, for without steadfastness of purpose, the Society will not be able to sustain its assumed role as the spokesman for entomology in Canada. There is no doubt that the Society must assume this role, if entomology is to flourish, because, as Dean F. L. McEwen pointed out in his Presidential address some years ago, re-organization of the federal government removed the Dominion Entomologist as principal spokesman for entomology in Canada, and no equivalent position was established.

Problems Addressed by the Society

What route has been followed to improve the status of Canadian entomology? In 1974, the Society began to address specific problems by collective action, directed by the Board, and financed in part by the federal government's system of contracting out projects under its "Make or Buy" policy for research. The first problem to be addressed was that of man-

power, and this consisted in: documenting the decline in number of entomologists employed, particularly in the federal service; determining needs; and determining available supply of personnel.

This was followed in 1977 by a contract for development of a Pilot Project for a Biological Survey of the Insects of Canada, with the intention of establishing an agency to coordinate and direct investigations to increase general knowledge of the fauna. This Survey was necessary because no agency, government or otherwise, had such a charge in its mandate.

The Arctic region houses the most distinctive element of the Canadian arthropod fauna. In view of this and the substantial investment previously made by the Federal Government in studying northern insects, it was decided that available knowledge of this faunal element should be consolidated and examined in the light of biogeographic and ecological principles. In 1978, a contract was obtained to prepare such a review, to be undertaken by the Biological Survey. In 1981, the Society published the resulting study, under the authorship of Dr. Danks, in two volumes: "Arctic Arthropods," and "Bibliography of Arctic Arthropods." These publications are major additions to entomological knowledge.

In 1980, a contract was obtained to study insect losses on specific crops. This was required because a need was perceived to demonstrate the economic value of programs designed to reduce such losses, and hence, some of the value of entomology and entomologists.

In 1982, a contract was obtained for a second manpower study, intended to review predictions of the first study, and to determine present-day conditions of need, demand, and possible supply.

Additionally, the Society completed unfunded studies: in 1978, a review of government support of University research in entomology; in 1982, a review of entomology curricula in Canadian universities; and in conjunction with the Biological Survey, a statement about need for research on soil arthropods.

With these initiatives, the Society has demonstrated its determination to act in a responsible way by obtaining and publishing useful information about entomology and entomologists, and it has demonstrated its ability to carry to completion the tasks it has set for itself. The Entomological Society of Canada enjoys good relations with various government agencies as a result of these activities—relations that will stand *it* in good stead in competition for support.

The Pilot Study for a Biological Survey has become the Biological Survey (Terrestrial Arthropods) of Canada, now a part of the National Museum of Natural Sciences. This is perhaps the most striking result achieved by our initiative, to date. But, this achievement was not simply the result of a good idea. It was the way that the idea was developed in the head of the Director of the Survey, Dr. H. V. Danks.

I would add that, as a result of the catalytic efforts of Dr. Danks, acting in his capacity as Survey Director, a symposium is being organized jointly by the Departments of Entomology and Soil Science of the University of Alberta, on soil organisms. This was identified in Dr. Wiggins' Presidential address as an area desperately in need of study. This is an illustration of what the Survey can do in encouraging development of important entomological endeavors.

Dr. Wiggins noted in his Report to the annual meeting last year that "The real issue for entomology in Canada is how best to compete for those funds that must be allocated for the development of renewable natural resources and of science." A similar message was contained in the June, 1983 issue of the Bulletin, in a report by the Executive of the Acadian Entomological Society. I believe this is the viewpoint that has been adopted by previous Governing Boards, and that 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. On the political level, I believe our goal should not be to obtain direct benefits for entomology, but rather to participate in establishing a climate that will be conducive to increasing support for science generally. And there is no question that such a job must be done. We seem to be living in a period when science is more or less profoundly distrusted, or at least its promise is misunderstood if not actually feared.

By our nature as scientists, we are not really well suited to engage in the political process. We do not think in terms of the short range that dominates the thought processes of professional politicians. As Dr. Wiggins pointed out in his Presidential Address, the organisms that we study, as important as they are in vital processes in the biosphere, do not capture public imagination in a positive way. Thus, these organisms are unlikely to excite the interest of the politicians, either. I think it is best to leave to the umbrella scientific organizations to which we belong the major part of establishing a good climate for science. Of course, we can make ourselves available by participation in the councils of such organizations and even more directly, by being seen in the meetings of such organizations as the Committee for Parliamentarians, Scientists, and Engineers (COPSE).

When it comes to seeking direct support for entomology though, let us work at our science, to influence government managers such as Assistant Deputy Ministers and Deputy Ministers in Departments with which we share direct common interests. These are the persons who will carry our messages to their Ministers, provided we give them messages to carry. Let us not spend time proselytizing and propagandizing the public or politicians. I recall a few years ago, listening to a parliamentarian urging us to get involved in the political process, and I left that meeting sick at heart. That man is no longer in politics, and if we had spent much time in seeking his support, our time would have been wasted.

What are we, in fact, doing? On the political level, we are supporting umbrella organizations: the Biological Council of Canada, and the Association for the Advancement of Science in Canada (the AASC). The BCC has been active on behalf of biology, meeting with parliamentarians and producing valuable reports. Dr. Wiggins is a Vice-President, Dr. S.B. McIver is on the Executive Council and Dr. D.E. Bright and Dr. R.G.H. Downer are observers. We also have a representative attending the COPSE meetings. Dr. Danks is our representative here. He notes in his report to the Board that at the meetings he has attended, emphasis is on short term political aspects of problems rather than on the scientific aspects. Dr. S. B. Hill is the Society's observer at AASC functions.

At the scientific level, we are working to obtain a contract to carry out stage 2 of the cost/benefit analysis of insect control, this time on wheat, corn, and canola. The Science Policy Committee has instigated an investigation of microbial insecticides. A report will appear in 1984, that is intended to enlighten interested parties about values and hazards of these materials. So, we are carrying on in the same direction that has been established by previous Boards and Presidents.

Of course, the goals of these studies are two-fold: 1), to document some facets of the economic importance of insects as a contribution to general enlightenment, and 2), to provide evidence that it is worthwhile to support entomology, and thus entomologists. This latter statement relates to employment.

Employment (or lack thereof) continues to be a major problem. It seems that not much can be done just now, because of the gloomy financial situation. Nonetheless, we have to prepare for the time when personnel will be desperately required, and hence positions will be made available in number. To that end, a second manpower study will soon be completed. The Employment Committee continues to issue annually the registry of entomologists seeking employment, and an employment desk was established at these meetings. Also, several articles appeared in the March issue of the Bulletin dealing with employment.

Internal Matters

The Governing Board and its Committees dealt with a variety of items best described as internal matters. I note a few here, in general terms. Details are in Committee Reports, published in this issue of the Bulletin.

Dr. D.C. Eidt decided to relinquish the position of Scientific Editor. A Search Committee was formed to seek a replacement. This committee is chaired by Dr. Ian Smith, and is currently engaged in its tasks. If you are interested in this position or know someone who might be, please advise the Committee.

A year ago, concern was expressed about Governing Board expenses, and a committee was formed under the chairmanship of former President Dr. W. J. Turnock to consider the desirability of bringing about a reduction. The Committee reported that Board expenses were reasonable, and that they had not increased disproportionately to other Society expenses. Expenses could be reduced, but only at the cost of reduction of number of Board members, and thus loss of representation from the Board. It was decided that this latter loss was of greater consequence than the potential monetary gain. However, the Finance Committee has now been directed to develop specific guidelines to regulate more closely expenditures that are incurred by Board members in conjunction with meeting the obligations of these positions.

The Publications Committee prepared a series of recommendations for dealing in a business-like way with future occasional publications that the Society may consider producing. The Committee also prepared an illustrated advertisement for sale of "Arctic Arthropods" and "Bibliography of Arctic Arthropods," two publications produced under the aegis of the Biological Survey (Terrestrial Arthropods).

The Membership Committee recommended that it would be desirable to advertise membership by publishing a notice annually in one issue of the Bulletin, with a detachable application form. This would have the effect of establishing a continuing drive for new members rather than having a campaign at irregular intervals.

Because of uncertainty about procedures in seeking and obtaining contracts for special projects, a set of guidelines was developed and approved by the Board.

Progress is being made with production of a list of French and English common names of insects occurring in Canada. I anticipate that it will be completed during 1984, and will be published by 1985.

The Scholarship Committee continues to do its good work. I will take this opportunity to invite each member to make contributions regularly and often. It is surprising to me that relatively few members of the Society have taken advantage of this opportunity to contribute to development of entomology by encouragement of worthy young students.

If the awarding of scholarships by the Society is its way of looking to and providing for the future, it seems appropriate that the contribution of those notables are commemorated upon whose efforts we build. Dr. B. Hocking proposed this in his Gold Medal address delivered 10 years ago at Banff, the same address in which he proposed establishment of the Scholarship Fund. The Organizing Committee for the joint meetings this year saw fit to establish the Heritage Lectures this morning, which was inaugurated by our own historian and Chairman of our Heritage Committee, Dr. P. W. Riegert. I hope that future Organizing Committees will see fit to continue with lectures honoring our predecessors, and that eventually these will become a standard part of our annual meetings.

We continue to be well served by the Bulletin, which is the principal means of intra-Society communication. The Editor, Dr. H. J. Liu, and Associate Editor, Dr. B. K. Mitchell, have made excellent and imaginative initiatives in adding to the value of this publication. Guest editorials have been introduced, and ideas of special interest to readers have been sought, such as the short series entitled "Approaches to Canada's needs for entomologists," which appeared in the March issue. Such initiatives are to be encouraged for they are much appreciated.

I want to remind members that, although the reports of Presidents on behalf of Governing Boards deal to a large extent with administrative matters that are essential to an organization of a thousand members, all of us share a common bond of interest in insects, and that is what our Society is all about. Not only are we to study insects, but we are to do so in the best way possible. Individually, we must strive for excellence. We recognize this, and more particularly, we recognize some of those who have seemed especially good at it in the form of scholarships for beginners, and achievement awards and Fellowships for the more seasoned practitioners. Brian Hocking referred to such individuals collectively as a "goodly company." Let us make sure that we recognize potential members of this "goodly company," and take the time and trouble to nominate them for appropriate awards to the committees charged with the task of making selections. These are the Awards Committee and the Fellowship Selection Committee.

In referring to awards, I wish to note that the Biological Council of Canada has instituted its own Gold Medal for those whose contributions are judged to extend beyond the sphere of their own specialties. Nominations can be made by any biological society in Canada. Let us see to it that the names of some of our own distinguished members go forward for consideration. The Executive Council can only endorse nominations received, and forward them to the BCC. It is up to our members individually or collectively to bring forward the names of worthy candidates.

Previously, I alluded to problems with which the Society is attempting to deal. I want now to mention two problems that are presently dormant, though they were of appreciable importance in the minds of some previous Presidents. I also will address an item that is of concern to me, but has not received attention previously.

About 10 years ago, in the aftermath of loss of the Society's office in the K. W. Neatby Building that had been provided for many years through the good offices of the Biosystematics Research Institute, the Governing Board was of the opinion that the Society should purchase a building to house our offices for administrative and editorial work. After further consideration, it was decided to continue to rent office space, and not to make the large investment required to have our own building. It is conceivable that, at some future date, we might be compelled to again consider purchase of a building for Society offices.

A second dormant problem is that of hiring an Executive Director, to provide administrative continuity for managing day to day operations, and to take on various lobbying jobs. Thanks to the efforts of our Treasurer, I doubt that at this time we need an Executive Director. Also, the extended term of each member of the Executive Council (four years, from Second Vice-President to Past-President) provides a high level of continuity. I hope we will never have to hire an Executive Director, for I fear that this would be the first step in development of an extensive and expansive office staff. I do not believe that a Society of our size could afford it. I hope we can continue to rely on voluntary workers, the Society activities of whom are generously supported by their employers. I am certainly not persuaded that we need a professional to lobby on our behalf.

The new problem to which I referred is centered about annual meetings of the Entomological Society of Canada. I wonder how successful our national meetings would be, if we did not meet with affiliate Societies. Attendance of one of our important constituents, the entomologists in Federal laboratories, is restricted by Treasury Board policy as interpreted by the Research Branch of Canada Agriculture. But there is another counter-force as well, and I want to note this, and to suggest what might be a future pattern, by referring to another organization and its fate. The International Congresses of Zoology began to be held every four years, beginning in 1891. The last one was held in 1973. The demise of these Congresses was evidently the result of two factors: more interest by the zoological community in meetings of narrower spectrum; and difficulty in finding countries that would host such large meetings.

As the years have gone by, knowledge has increased exponentially, and to keep abreast biologists have had to restrict their areas of special interest. Also, as the number of workers has increased in specific areas, each such group has developed its own specialized society. Thus, on a taxonomic basis we have societies of lepidopterists, of coleopterists, of hymenopterists and of hemipterists. Various groups hold meetings at more or less frequent intervals: odonatologists, trichopterists, and ephemeropterists. Fields based on functional considerations have developed, with meetings being held by physiologists, biochemists, behaviorists, neurobiologists, and so on. Groups with interests in economic aspects of various taxa have emerged, and such as the Mosquito Control Association, and workshops on forest insects.

These meetings compete for attendance with the discipline-based societies, such as the Entomological Society of Canada. There are only so many meetings a person can attend in a year, because of constraints on finances and on time. I suggest that broad-spectrum Societies such as ours, might have difficulty in holding meetings annually, and perhaps we will have to go to holding meetings every second or third year if attendance drops. I realize that this is liable to cause problems for our organization in relation to the Societies Act, but that cannot be of primary concern. I am not sure it would be a bad thing to meet less often, though I certainly do not advocate this, at this time. Our meetings would then become congressional in scope and function, intended to draw representation from the specialist groups.

Concluding Remarks

As I come to the end of this address, I also approach the end of my term as President. I wish to acknowledge those who served with me on the Executive Council, and Board, and those who served on Board Committees. They worked hard and well on behalf of the Society. I must pay special tribute to Dr. Eidt, who is retiring as Scientific Editor. He has served wisely and well in a highly demanding post. At the same time, I am pleased to thank Doug's able assistant, Mr. C. A. Miller, who is retiring from the post of Assistant Editor. They have set and maintained very high standards, indeed. I express personal gratitude to our Secretary, Dr. W. G. Wylie, who has completed his second year in this position. I am pleased to thank and congratulate Dr. E. C. Becker, who has completed his twenty-third year as Treasurer of the Entomological Society of Canada. Finally, I thank the spouses of Board and Committee members who also served by permitting and even encouraging their mates to devote long hours to Society business.

George E. Ball,
President

GOLD MEDALLIST'S ADDRESS

Entomology in Canada — Vital, and Regenerating

by
F. L. McEwen*

From time to time it is important for any profession to take an 'in-depth' look at itself and assess its status. To some extent this is done for entomology each year in the report of the president but quite frequently these reports deal with an annual activity briefing and the overall health of the society is dealt with only in a peripheral way. I do not pretend to be an expert in analyzing anything but after fifteen years of close association with entomology in Canada, I present my opinion on how we fare. I am not going to use a lot of statistics but, rather, present what I consider evidence to justify my conclusions. I present this under the title 'Entomology in Canada—Vital, and Regenerating' because this is the conclusion I reach despite much muttering at the bench about underfunding, lack of coordination, no visible long range planning, attrition in the ranks and not enough jobs for graduates.

If one is to assess the status of a profession it is necessary to decide on some criteria that can form the basis for such an assessment. I am sure a long list could be developed for entomology but, I shall look at only three: quality, recognition and service.

Quality

In the scientific community quality of a profession or discipline is the sum of the recognition accorded by peer groups to the individual members. For entomology one key indicator is our professional journal, the Canadian Entomologist. This journal is highly recognized and subscribed to by libraries throughout the world. Well it should be, because its peer review of manuscripts is rigorous, its physical quality good, and its subject content broad. Many leading entomologists in countries other than Canada are members of the Entomological Society of Canada primarily to have the opportunity to publish in our journal. The high quality of our journal is further demonstrated by the fact that NSERC provides a publication grant to help support it and, despite the fact that publishing in our journal is one of the most expensive outlets for entomological papers, the supply and quality of manuscripts remains high.

In addition to providing high quality for our own publication, Canadian entomologists publish in many other highly pretigious entomological journals as well as others that deal more generally in the biological area. Entomologists in Canada thus publish in prestigious entomological journals that are read throughout the world.

A second indicator of peer review on quality is the competitive grants program of NSERC. Each year, NSERC publishes a listing of the grants awarded. If you have not taken the occasion to peruse this report, I urge you to do so. It provides a quick synopsis of what the university community is doing in research and an index to the top Canadian researchers on university faculties. If you peruse this you will note that entomologists hold a good number of high awards. You will note also in a separate NSERC publication that a significant number of recent Ph.D. graduates in entomology have been awarded five year university fellowships.

I conclude that in situations where Canadian entomologists are exposed to peer review, they do very well and if these assessments are valid, the quality of Canadian entomology is high.

Recognition

To a significant extent measures of recognition are also measures of quality, however, I separate the two since, in some cases, recognition may have political or token significance, not truly reflective of quality. What are some of the things that might be considered? 1) Invitations to international symposia and conferences. I would be the first to recognize that in some cases such invitations are self generated and I must confess the 'old boy network' often operates in the extreme. One can spot these very quickly, however, and they should not be construed as criteria of recognition. If, however, one looks at the international congresses and workshops on systematics, ecology, physiology, biological control, arbovirus transmission, plant and animal protection, etc., we find major Canadian contributions—not just as

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token Canadians but, as real contributors, symposia chairman and chairwoman, etc. Similarly, if one looks at Canadian workshops and symposia on biological matters, again entomologists are prominent. Thus, our profession is recognized as well as our expertise within our profession. 2) Employer reaction. I believe an extremely important area of recognition of entomology is evident within Agriculture Canada, the largest employer of entomologists. During the 1960's and early 1970's there was a rationalization of disciplinary research within the Research Branch of Agriculture Canada and the number of entomologists was reduced significantly. This rationalization was associated also with some overall reductions not only in Agriculture Canada, but, in Fisheries and Forestry as well (e.g., the closing of the Winnipeg Laboratory). The Entomological Society of Canada protested vigorously and in a manpower study documented the seriousness of attrition of entomologists. I do not know whether or not our protestations were influential, but, I suspect they were. In any event, the attrition has stopped. Despite the fact that my bias is heavily toward entomology, despite the fact that the needs for entomological research are great, despite the fact that, as has been documented in the insect losses study, more entomologists would pay for themselves many times over, I believe that the percentage of complement that the Research Branch assigns to entomology is realistic. It shows in a very concrete way that Agriculture Canada sees our profession as important. It is my understanding that the Ministry of the Environment is reassessing its needs in forestry and that entomology is being recognized in that reassessment as high priority.

I should point out that the Entomological Society of Canada is being recognized as both important and competent through initiatives in contract research that we have undertaken. The survey program has resulted in a decision by National Museums of Canada that insects are an important part of their mandate and they have taken steps to implement that mandate. A manpower study supported by Supply and Services Canada developed perhaps the best manpower inventory of any scientific society in Canada and our work on insect losses has attracted international recognition.

I conclude that entomology in Canada is well recognized and that Canadian entomologists are highly regarded for their contributions to the discipline.

Service

I will not dwell significantly on the role Canadian entomology plays in its service function since this was covered extensively in a symposium at the annual meeting in Banff two years ago entitled 'The Economics of Entomological Effort.' As a discipline supported largely by public funds, we must justify our existence in terms of service to the public from which these funds derive. Those of you who attended the Banff symposium will recall that it dealt with two areas. a) The contributions of entomology to the basic sciences and reservoir of knowledge about our country, and b) to the economic, social and health benefits that resulted from our work. In all instances the documentation was impressive.

I would like to discuss briefly one area of service in which entomologists currently have an essential role to play and are playing it. It has to do with food production and the use of pesticides.

As you all know, following World War II when highly effective insecticides became available, we, as entomologists, recommended their use for insect control in agriculture and forestry with outstanding results. For example, a recent study by this society has shown that on apples, onions, and potatoes, crops in which the potential for insect loss in Canada is immense, losses due to insects are, in fact, only about three percent.

In some cases however we adopted insecticides as a single strategy for insect control and that did not and will not work.

Canadian entomologists were the first to recognize this and to advocate what has now become known as integrated pest management. This is an important and critical development for Canada if we are to continue to maintain destructive insect pests below damaging levels and assure the public that its food supply is safe. The minister of agriculture in Ontario in a recent speech to the Canadian Agricultural Chemicals Association commented as follows:

> 'The issue of 'chemical activism' has been raised. I would view that movement as an extreme version of a more general consumer concern about health and especially the health effects of food. The legions of joggers on our city streets, the boom in health clubs, and the drop in cigarette smoking—all are part and parcel of a new thrust toward healthy lifestyles. The trend may have begun as a fad, but, it has now become a fact of life the food industry cannot afford to ignore.'

The use of insecticides in food production, in mosquito control programs and around the home is a genuine public concern. You and I as entomologists have a very important service role to play in developing insect control procedures that do not cause the public anxiety.

This requires input from most of the sub-disciplines within our profession. We have an obligation here that we cannot afford to ignore.

In the title of this presentation, I mention regeneration. In his 1971 presidential address, President Baldwin deplored the closure of several projects of the Fisheries and Forestry Department and the closing of the Belville laboratory of Agriculture Canada. As entomologists, we agree that these closings were a severe blow to entomology in Canada. Against that however, must be placed the emergence of a strong program at Simon Fraser University, a greatly expanded program at the University of Guelph and an important new initiative in entomology at Laval University. The result has been that the facilities for graduate study in entomology in Canada have been vastly improved. The 1983 listing of resumes of entomology students seeking employment lists eighteen Ph.D.'s (12 Canadian), sixteen M.Sc.'s and seven at the B.Sc. level. I suspect that this list is not complete and my impression is that, provided students take advantage of the option to study at more than one insitution and to use some non-Canadian schools for some specialized areas, our training program can meet future needs.

It should be pointed out in addition that Agriculture Canada has reintroduced their program of upgrading their own staff by sending them back to universities for graduate study and, in some instances, hiring graduate students in progress and supporting them to continue their degrees. This must be viewed as a very positive statement by Agriculture Canada that they intend to maintain their research programs, including entomology.

While it is clear that the entrance of new students to the entomological profession is an important harbinger of regeneration, there are other aspects of entomology in Canada and the activities of this society that I believe equally important.

In his presidential address in 1972 President Corbet listed six roles that the Entomological Society of Canada should perform to serve its discipline: "1) facilitating communication and liaison among entomologists, 2) maintaining, and making available, inventories of entomological programs, resources and job opportunities, 3) providing entomological information, advice and recommendations to entomologists and non-entomologists, 4) providing encouragement and support to amateur entomologists, 5) acquiring information about insects and particularly information that will allow Canadian insects to be identified, and 6) providing continuity and stability for the science and practice of entomology in Canada."

Dr. Corbet dwelt on this latter point in relation to the continuing reappraisals and scrutiny being given science in Canada at that time. It is likely that such reviews, under the heading of public accountability, will continue. Our society has moved to justify its programs, to document the benefits that accrue and to discuss in public forum long range needs in our profession and how these can be met. If we continue on this path, then entomology in Canada is indeed vital and that vitality will be self propagating.

ESC Gold Medal Winner, 1983. Freeman L. McEwen (right) receives Gold Medal from ESC President, George E. Ball, 3 October 1983, Regina, Saskatchewan.

THE HERITAGE LECTURES

Introduction to the Heritage Lectures

by
G. E. Ball*

In 1973, Brian Hocking, in his Gold Medal Address, entitled "Colloidal Suspense," spoke about past and future. He urged us to learn about our illustrious predecessors, and also to do something about future entomologists, or else we would be without illustrious successors.

For the future, he advocated a scholarship fund, to help along and encourage promising students. This fund has been established.

For knowledge of the past, he advocated development of a series of historical lectures, taking a "leaf from the book of our friends in the Entomological Society of America", with their "Founders' Memorial Lecture." But, he suggested that we not copy their procedures directly, but rather modify the idea to suit our own wishes.

This proposal lay dormant for nine years, until it appeared last year as Decision 17 of the Board meetings. It stated: "Agreed to investigate, in collaboration with the 1983 Annual Meeting Committee, the possibility of having a speaker at the 1983 Annual Meeting honour a Canadian entomologist, entomological event, or entomological research institute." And that is what we are here to do today.

The Nature of History

What is history? One of the most banal definitions I heard was given by a Professor of Education at the University of Alberta. He stated that "history is HIS STORY," implying thereby that a carefully prepared and reasoned account of past events was nothing else than a personal view which was no better or no worse than anyone else's. If that statement represents the notions of the teaching profession about history, it is no wonder that the public is restive and concerned about what is happening in our primary and high schools.

Another savant stated that: "History is Bunk." That was Henry Ford, who offered this definition shortly before the beginning in the Great Depression. Had he and our other industrial leaders had some notion of history, they might have been able to foresee and head off the economic disaster that befell the land.

I obtained a rather more elegant statement about the definition and nature of history from a book by Herbert J. Muller, an English Professor at Purdue. The book is entitled "Uses of the Past" and was published in 1952, by Oxford University Press. Muller wrote:

History is "... The story of a rational animal who thereby lacks the sureness of instinct, is a prey to irrational desires, and of all animals leads the least sensible life; who alone is free to choose and aspire, and so is forever torn by doubt and discontent, from which spring at once his loftiest values and his ugliest hates and fears; who alone can know truth and virtue, and by the same token is prone to error and evil, capable of a folly unknown to dumb brutes. In a time of troubles, history is a story of how the best is apt to become worst, as high fixed principles and as uncompromising sincerity ends as the terrible falsity that inspired an old proverb: 'May God deliver us from the lies of honest men.' At all times history is the story of the inescapable hazards that man brought upon himself when he took to playing with fire, and then without forethought, set out on the extraordinarily bold adventure of making over the world in which he lived. While ever since he began to reflect, he has been seeking a repose that he can find only in the death he fears. This is the theme of high tragedy."

Another historian, Morris Cohen, wrote: "The ideal of history is an imaginative reconstruction of the past, which is scientific in its determinations and artistic in its formulation."

From history in general, we turn to the history of science as a more specific field, and progressively more specific still, the history of biology, and then history of entomology. Ernst Mayr, in his great book "Growth of Biological Thought," published in 1982 by Harvard University Press, wrote that there are different kinds of histories of science depending upon the questions phrased by the writer.

1). *Lexicographic histories* focus on events that transpired at a given time, and attempt to reconstruct the important events of a specific period. Questions "what," "when," and "where" are featured.

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2). *Chronological histories* recount the sequence of events through time, and here dates are featured, with emphasis on the question "when."

3). *Biographical histories* feature important individuals, and what they did and what effect they had on events relevant to the interests of the historian. The question "who" is emphasized.

4). *Cultural and Sociological Histories* seek to explain events in terms of the general cultural milieu in which they took place. The question "why" is emphasized.

5). *Problematic Histories* center on tracing development of ideas and related controversies through time. Again, the question "why" is emphasized. All of these are valid approaches to history.

One might ask, but why study history at all? Again, I turn to historians for an answer. Professor Muller writes in his book "Uses of the Past":

"The most appropriate use of the tragic view of history is the melancholy one of helping us to prepare for the worst. If all the great societies have died, none is really dead. Their peoples have vanished, as all men must, but first they enriched the great tradition of high, enduring values. We might be heartened as well as sobered by the thought that we should vanish into the same darkness, and live on in the same tradition. We might be freed from the vanity of grandiose hopes, as well as the vanity of petty concerns. We might learn that 'ripeness' is all, and that it is enough."

And, shortly before the 4th Crusade arrived at the gates of the Eastern Christian capital of Constantinople and proceeded to destroy the great library there along with other irreplaceable treasures, Anna Comnena, daughter of Alexius, last of the Byzantine emperors, wrote: "The tale of history forms a very strong bulwark against the stream of time, and checks in some measure its irresistible flow, so that of all things done in it, as many as history has taken over it secures and binds together and does not allow them to slip away into the abyss of oblivion."

The Heritage Lectures

Let us turn from these general considerations to the matter before us. The Organizing Committee for this meeting has established *The Heritage Lectures*, which we hope will become an annual event, and a regular feature of our meetings. The speaker will be chosen by the Organizing Committee, and early enough so that he or she has adequate time to prepare. The address can focus on an individual, event, institute, or series of events, and can take any of the approaches listed above. I hope that these Heritage Lectures will be of publishable calibre, and that they will become a regular feature of the Bulletin. In that way, we will build up over a period of years, a series of accounts about people and events, memories of which are sufficiently important so that they must not slip "into the abyss of oblivion."

The speaker and inaugurator of the series is chairman of the Heritage Committee of our Society. He is a distinguished Canadian entomologist with 20 years of service with Agriculture Canada and 13 years of service as a professor of zoology at the University of Regina, where he was also Chairman of the Department. He is a former President of the Entomological Society of Saskatchewan. He is himself an historian of entomology, having published a book entitled: "From Arsenic to DDT, a History of Entomology in Western Canada" (University of Toronto Press). In the Foreword to this book, John Archer, a professor of history, wrote "This is a very good work. It is both scholarly and entertaining. It is written with a deft touch of knowledge, enlivened by humor, zestful for action."

Paul Riegert will speak about *Thomas Nathaniel Willing: Prairie Naturalist*.

THE HERITAGE LECTURE

Thomas Nathaniel Willing, Pioneer Prairie Naturalist

by
P. W. Riegert*

Few, if any, of the entomologists gathered here on this, the 33rd Annual Meeting of the Entomological Society of Canada, may have knowledge of the man whom we are honoring today. It has been my privilege to delve into the memorabilia of the past and bring to light some of the aspirations, ambitions, and accomplishments of this prairie pioneer naturalist. The task has been a pleasant one, not only because I love history, but because the knowledge of the past has permitted me to make some assessment of the state of the art of our present-day science of entomology. It has permitted me to reflect, perhaps with a certain amount of awe and wonder, on the great advances we have made in defining and understanding the natural phenomena that surround us. At the same time I have become keenly aware that some of our so-called "progress" has simply turned the set back to "square one." We have completed a cycle and find ourselves, in some instances, back where our pioneer forefathers, and fellow scientists, found themselves 100 years ago. That puts us right into the era of T. N. Willing—we can now pick up the story.

Thomas Nathaniel Willing was born in Toronto in 1858, the son of Thomas Willing and Jessie (nee) Gillespie. His father was a Canadian by birth whereas his mother was an emigré of Edinburgh, Scotland. Young Thomas took all of his schooling in Toronto, at the Model School, where he early showed an intense and appreciative interest in natural history. The two components, plants and insects, were the chief targets of his interest and remained so throughout his life.

By the time he reached his twenties the lure of the western plains and the anticipated excitement of the unknown territories that lay between Upper Canada and the Rocky Mountains gripped him with a force that he found irresistible. In 1880, being 20 years of age, unattached and free to travel, he worked his way west on a survey crew. It is not certain, but quite probable that he was part of the railway survey crew that was pushing the new transcontinental railway west to Winnipeg. On the other hand, it is just as probable, and more likely that he served as part of a land survey crew; western lands were receiving detailed scrutiny, assessment, and sub-division in preparation for settlement. Imagine, if you will, the delight of young Thomas in being able to explore and examine the many wonders of nature that he encountered during the survey; the seemingly endless array of flower, plant, bird, animal, and insect life that greeted him at every step and turn.

He spent a few months in Winnipeg savouring the prairies, exhilarated by the newness that surrounded him. Then in 1881 he was hired by the C.P.R. The railway, in its colonization interests, required the services of one who could investigate and evaluate their lands, and assess their crop-growing potential. They had heard of Willing's interest in, and knowledge of, plants and animals and thus offered him a chance to do the evaluation work for them. This was a heaven-sent opportunity to see, study, and assess the natural history resources of the west, and he jumped at the invitation. For the next two years he literally walked from Winnipeg to Calgary, tramping the virgin prairie of the C.P.R. lands and assessing their agricultural potential. He also, undoubtedly, got some impression of the insect life on the plains: the explosive onslaught of the Rocky Mountain Locust; the many ground beetles; the metallic blister beetles literally covering individual *Astragalus* plants; and the hundreds of moths and butterflies that sallied forth from shrub and weed patches as he passed.

He was so taken with the potential of the western Canadian land that he gave up his job with the railway and acquired a homestead. Land was available, just for the asking, and the

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foothills grassland country near Calgary suited him most adequately. Here for the next two years he undertook the gargantuan task of carving a small ranch out of the virgin territory. Life was merciless on the frontier. Only whose who had determination, high resolves, strong physical constitutions, and flexible attitudes that could sway with the pendular forces of nature, could survive.

Survive he did! He amassed sufficient capital through his ranching endeavours, supplemented with freighting, that he was able to buy a farm near Olds—in present-day Alberta—in 1885. He also acquired a help-mate, for in that year he married Victoria E. M. Evans, the daughter of J. H. Evans of Montreal. They settled on this farm near Olds and made it their home for the next fifteen years.

Throughout these years his interest in plants and insects never waned. For one thing, he was appalled at the ever-increasing number of weeds that appeared in the fields and crops of the settlers. Many, if not most, of the immigrant farmers brought weed seeds into the area along with their settler's effects and in uncleaned forage and cereal seed. Many settlers did not, or could not, distinguish weed seeds from crop seeds, much less recognize the various species of weeds and weed seeds present on their farms. Willing, as a good ecologist, was well aware that an increased cafeteria of plants as insect food, also increased the density and diversity of insect species. He voiced his concern about the weed-insect problem to all and sundry and attempted to teach his erring neighbours how to mend their ways. Most were too busy to pay much attention to him, and there were too few settlers to cause too much concern among themselves. But help was on the way.

James Fletcher had been appointed Dominion Entomologist and Botanist in 1884 and within the year had more than 400 knowledgeable correspondents—mostly practising farmers—from across Canada, supplying him with information on the current status of insects and weeds in the Dominion. One of these correspondents was T. N. Willing.

When the two met in 1885, on Fletcher's first tour of western Canada, an immediate friendship was struck between the two men. Weeds and insects struck the same sympathetic chord in each of them so that mutual interests welded the bonds that heightened their work. Fletcher did all in his power to aid Willing: supplied him with nets, papers, pins, boxes, plant presses, killing bottles; all the paraphernalia that could be used to collect and preserve insects and plants. He also provided the latest information on insect pest control so that Willing, in turn, was able to impart this to his neighbours and friends. Willing, on his part, collected as many of the plant species as he could find in the Olds area. These he sent to Ottawa for identification and for preservation in the Herbarium of the Central Experimental Farm.

Help with insects came not only from Fletcher but also from a group of very active amateur entomologists in the region. These included Percy and Arthur Gregson at Blackfalds, Norman Sanson at Banff, F. H. Wolley-Dod at Calgary, A. Hudson at Midnapore, and several more at nearby locations. They all collected insects, reared the larvae, studied their life histories, and traded specimens. It was a very congenial and intimate group, the members of which were very enthusiastic about their avocation and shared information with zeal.

But the one thing that really stuck in Willing's craw was weeds. It was almost an all-consuming passion for him to try ridding the country of the costly plant pests. The Territorial Government had passed the "Noxious Weed Act" of 1883 to control Canada thistle, wild mustard, cow cockle, and wild oats. Every landowner or occupier of land, and every railway, was required to destroy weeds or face prosecution and fines. Legislation was easy but enforcement was a real problem. No settler wanted to complain about his neighbour and, therefore, few if any, actions to enforce the law were forthcoming.

The weeds kept on increasing, complaints continued to pour in to the government—Willing's undoubtedly were the loudest— but nothing much happened until 1892. Then the politicians, in their collective wisdom, decided to enact legislation that would permit each municipality to appoint a weed inspector who, in turn, would see to it that negligent farmers would be prosecuted. Weeds would now be under control by decree!

Thomas Willing was quite in favour of this move because he too thought it would make the farmers take heed. However, the standards of "weediness" varied from one inspector to another and no one was particularly keen on taking action against a neighbour. Nothing came of it. There was no marked improvement in weed control in the Territories. Then in 1896 the Noxious Weed Act was again amended to permit the establishment of "Noxious Weed Districts." Now the Territorial Government could hire inspectors, set standards, and appoint qualified men to the position of "Inspector." The positions were to be Civil Service positions and under explicit government control.

Willing was immediately interested in such a position, partly because he could, as a "Territorial Weed Inspector" force people to control weeds; partly because he sincerely loved the work; and partly because it was only part-time employment and he could still remain on the farm. He also argued that if weeds were controlled then the number of insect pests would

be decreased very significantly, especially the Lepidoptera. Qualified men were very scarce in the sparsely settled districts of western Canada, and Willing was certain he could get the job for the Olds district if he applied for it.

However, he left nothing to chance. He consulted with his friend, James Fletcher, and asked him to endorse his application. Fletcher was delighted to put his stamp of approval on Willing's application for he considered the latter to be "the best qualified man for the position you can find."[1] Willing was a shrewd individual. He knew that if he got the backing of the Dominion Botanist he might have a good chance of dictating his own salary. In Manitoba they were paying $2.50 per day and expenses. Willing asked for $5.00 per day and $3.00 expenses per diem. As expected, he got the appointment as a Territorial Weed Inspector for the Olds-Lacombe district in 1897; one of eleven such positions in the North West Territories. He also got the salary he requested!

The new situation that Willing found himself in, was very much to his liking. He could now do what he had always wanted to do: control weeds, farm his land, and enjoy the companionship of his fellow entomologists in their studies of insects. He became so involved in his entomological interests that he not only endorsed the creation of the North-West (Canada) Entomological Society in 1891, but also became its Secretary. He held this position for the 5-year life of the Society and continued on in the same position in the reincarnated "Territorial Natural History Society" in 1902. During his tenure he was intimately involved in all the operations of the Society: promoting collections, attending and conducting field days, offering identification service, and teaching control to fellow farmers.

As the 19th century drew to a close the continued influx of settlers expanded the amount of arable land and increased the potential spread of weeds, plant diseases, and insect pests. Eleven weed inspectors could not cope with the expansion so the Territorial Government increased their number to 20 in 1898. Somehow this move compounded the misery. Twenty field men had a tendency to perform at 20 levels of proficiency, have 20 concepts of enforcement, and create 20 different performance problems, if each worked unguided. What was lacking was overall supervision and co-ordination.

Willing, because of his interest in, and honest, sincere dealings with weeds in his district, was suggested as a possible candidate to supervise Territorial weed control. The fact that he was friends with, and had been a founding member of the Lacombe Entomological Society along with the Deputy Commissioner of Agriculture, C. W. Peterson, may have been a factor in the naming of a supervisor. He got the job as Chief Weed Inspector, but only on a *protem* basis. No one ever got a long-term appointment with the government in those days until the individual had at least proven his worth for a year. Willing did such a tremendous job of supervision and co-ordination of weed inspection and control in 1899 that the Commissioner of Agriculture, George Bulyea, was sufficiently impressed to make his appointment permanent. Hence, on 15 May 1900, T. N. Willing was made the Chief Weed Inspector of the North-West Territories. He sold out his interests in Olds and moved to Regina.

He now could devote all of his energies, and give his complete attention, to the job at hand. He had 40 field men to supervise, which left him very little time at home during the growing season. He criss-crossed the plains of Saskatchewan and Alberta by train, wagon, buggy, and on foot. He examined, inspected, and condemned many fields because of weeds. He scolded, taught, cajoled, lectured, demonstrated, and pleaded with farmers to exercise better weed and insect control. Oh yes, he also prosecuted the non-doers so that in a few short years there was a marked improvement in the containment of weeds in the Territories.

His many trips were tailor-made for entomological pursuits. They afforded him excellent opportunities to keep a watch on all noxious insect pests, and do some diligent collecting. Many miles were travelled in the company of James Fletcher; the two fast friends savouring their entomological collegiality to the full. Although it was not in his purview to be responsible for the control of noxious insect pests, the Commissioner fully expected him to be the "Pest Control Specialist" of the day. He investigated outbreaks of wheat stem sawfly at Indian Head, turnip beetles at Saskatoon, and was alarmed at the continued spread of, and damage done by cutworms in western Saskatchewan. His observations of the population density, damage, and effects of cultural control measures were a great help to Fletcher in establishing procedures of control for the cutworm.

Other insects in which Thomas Willing evinced considerable interest were the Hessian fly, wireworms, grain aphids, Colorado potato beetles, and black blister beetles. Concerning the latter, Willing took a unique approach to their control. In 1906, when the beetles were damaging potatoes in the North Battleford area, he suggested that several people walk across the field waving branches to drive the beetles out. Arsenicals, in the form of Paris green, were to be used only as a last resort. He did not want to kill the beetles because their larvae are predators of grasshopper eggs, and by simply chasing them out of the potato field they might lay their eggs in places where grasshoppers needed to be controlled. Willing's farsighted-

ness, in this instance, indicated his concern for the environment. He advocated biological control as an alternative to chemical control; a concept that we here today—some 80 years later—are promoting in our theme "Integrated Pest Management."

In 1905, when part of the North West Territories became the autonomous provinces of Saskatchewan and Alberta, Willing was still co-ordinating weed and insect control on more than two million acres of cropland in Saskatchewan. Forty weed inspectors were on the job, some in areas where English was unknown, and as many as 14 other languages were heard and spoken. Willing had always stressed education and was instrumental in producing a variety of information pamphlets and bulletins—some in foreign languages—that would acquaint the new settler with the weeds and insects that might plague him.

Because natural history was Willing's whole life, the Commissioner of Agriculture decided that he would supplement the insect and weed duties with others. He appointed Willing as Chief Game Guardian. The new duties included the issuance of hunting permits, imposing game harvesting schedules and quotas, licensing of trapping of fur-bearing animals, and waterfowl management. Today these duties fall within the jurisdiction of several governmental departments and constitute the daily work of half a dozen officials. Eighty years ago Willing handled all of these chores with the aid of an office clerk!

When the University of Saskatchewan was established by legislation in 1907, classes did not commence until the fall of 1909, and then only in Arts and Science. A College of Agriculture was established in 1912 but preliminary classes were begun in 1910. For that purpose professors were needed to do the teaching, supervise short courses, and become active extension workers. T. N. Willing, having the expertise in natural history, was lured away from the Saskatchewan Department of Agriculture in 1910 and appointed as an Assistant Professor of Natural History. He was attached to the College of Agriculture and became its Secretary. He was promoted to the rank of Professor in 1915, a position he held until his death on 30 November 1920.

As a professor at the University he brought with him an invaluable store of knowledge of the flora and fauna of, not only Saskatchewan, but of western Canada. He lectured to students in Agriculture and to the teachers-in-training in the Normal School. He was not a science teacher, *per se*; not attached to a Science or Biology Department and therefore, his lectures contained much more 'homey' natural history than mere cold, scientific fact. Students received practical training in weed and insect identification, as well as control of pests, plant diseases, and mammalian predators. They were given lectures on dairying, soil management, cropping practices, and conservation; all designed to provide a broad framework of information related to successful crop and animal production.

Perhaps T. N. Willing's life and work can best be summed up in the words of Dr. Walter C. Murray, the first President of the University of Saskatchewan. He said:

"... he has been a keen observer, a devoted servant and a lover of the West. Endowed with an unusual gift of close and exact observation, a retentive memory, and with the scientist's untiring zeal and questioning spirit, he made great use of his opportunities to attain an almost unrivalled knowledge of the fauna and flora of Western Canada. Though his modesty prevented him from publishing and making known the riches of his information, he was recognized as one of the pioneer naturalists whose knowledge of the West was wide, exact, and reliable. The very valuable collection of plants and insects which he made and presented to the University will be preserved as a memorial of his work and as a visible evidence of his living and loving service.

His colleagues will long cherish the memories of his kindly ways, his delightful companionship, his modesty, his generosity in placing the stores of his knowledge and expertise unreservedly at the service of every inquirer, whether student, farmer, teacher, boy scout or savant from abroad."[2]

We here today recognize and honour Thomas Nathaniel Willing, as one of Western Canada's leading, though little known, pioneer naturalists.

References:

1. Fletcher, J. 1897. Department of Agriculture, Dominion Entomologist and Botanist Letterbook. Public Archives of Canada, R.G. 17, A117, Vol. 2342, p. 681.
2. Murray, W.C. 1922. President's Report for the Year 1920-21. University Saskatchewan Archives, Presidential Papers, Series 1, B 38/13.

Acknowledgment:

The courtesy and co-operation of the Archivists of the University of Saskatchewan Archives, the Saskatchewan Archives Board, and the Public Archives of Canada, is hereby gratefully acknowledged.

REPORTS FROM OFFICERS, TRUSTEES, AND COMMITTEES

Annual Report of the Secretary for 1983

During the past year I have recorded minutes of the Annual Meeting and the meetings of the Governing Board and Executive Council, prepared the Agenda for these meetings and sent out notices of meetings, as required, to the Executive, Directors, Trustees and Representatives of the Society. I have maintained the files of the Society; updated copies of the By-Laws, Standing Rules and Committee Guidelines; prepared the ballots for the election; notified nominees of the election results and distributed minutes, reports, scholarship forms and other information as requested; prepared notices of meetings and of Society affairs for the Bulletin; provided liaison between committees of the Society and Governing Board, and between the Society and Affiliate Societies. Much of the time spent on Society business involved taking care of correspondence and day-to-day affairs of the Society.

I would like to thank the Executive Council, Trustees and Directors for their help and advice during the past year.

H. G. Wylie

Report of the Finance Committee for 1983

The Finance Commiteee (FC) met on April 4 and September 16, 1983, in Ottawa. The following recommendations were presented to the Governing Board.

1. The FC recommended that the ESC purchase a small computer/word processor and appropriate software for the business office. This equipment will be used to increase the efficiency of the business office by maintaining more up-to-date mailing lists, by assisting in the accounting procedures, by addressing envelopes, preparing invoices and more frequent and accurate publication of mailing lists. On a long-term basis this equipment could save as much as $2000 per year in direct costs and, after the initial training period, considerable savings in staff time.

   This recommendation was based on a detailed report of a subcommittee composed of H. V. Danks (Chairman), R. Harmsen and E. C. Becker, as well as a recommendation of the auditor.
2. The FC will continue to monitor the cost/time savings potential of using word processing disks of longer manuscripts submitted for publication in either the Memoirs or the Canadian Entomologist. No suitable manuscripts have yet been published, but one long (ca. 700 pp.) manuscript prepared on a compatible word processor has now been accepted and will be monitored.
3. The FC has expressed considerable appreciation for the work done by the auditors appointed in 1981. Based on their recommendations, the ESC has adopted a completely new system of accounting. The adoption of this new and expanded system has enabled the treasurer and auditor to prepare budgets, financial statements and auditor's reports that are based on the same categories so each of these documents can be compared. Also, use of this system enables members and the governing board to determine the financial status of each of the society operations rather than be presented with a few overall figures showing only the net gain or loss of the society for one year.
4. The FC recommended that the annual grants to regional societies be increased from $100 to $200.
5. The Society received a bequest of $19,800 US from the C.P. Alexander estate to support publication of the Canadian Entomologist. This sum has been invested according to the wishes of Dr. Alexander and the publications committee has been asked to recommend a policy for use of the interest generated by the fund.
6. The FC recommended the establishment of a series of endowment funds composed of the Scholarship Fund, a publication fund now consisting only of the C. P. Alexander bequest and a General Fund yet to be established.

7. The projected financial statement for 1983 shows a projected loss of $27,948. Increases in dues, subscriptions and page charges become effective in 1984 and the proposed budget for 1984 shows a projected deficit of $19,230. However, this figure included $15,000 for the purchase of computing equipment and software and $21,000 to be transferred to the investment fund.

D. Barnes
E. C. Becker (ex officio)
J. M. Campbell (Chairman)
H. V. Danks
R. Harmsen
J. R. McLean
B. J. D. Philogène

Report of the Scientific Editor for 1983

In the 48-week period ending 19 August 1983, 241 manuscripts (5.02/week) were received, up from 252 (4.85/week) for the 52 weeks ending 13 September 1982. The disposition of these manuscripts was:

	48-week period ending 19 Aug. 1983	*52-week period ending 13 Sept. 1982*
Under review	48	37
Rejected (A)	35 (1)*	24
Combined with others	0	2
Withdrawn (B)	3	5
To authors for revision	42	37
Accepted	84 (3)*	83 (2)*
Published	29 (1)*	51
Total (C)	241	252
Rejection rate $\frac{(A+B)}{C}$	15.77	9.52

*papers resubmitted after having been rejected

A truer estimate of the rejection rate (perhaps more correctly termed attrition rate) is 39% compared with 36% last year, based on the number of papers published in the 12 issues ending September 1983 + contemporary *Memoirs* (179) and the number of manuscripts received a year earlier (252).

Time in review

Months in review based on 100 recent papers continues to improve:

	mean	*mode*	*range*
1982	2.1	2	0 - 5
1983	1.9	1.5	0 - 5

Time to acceptance, usually another month longer, was not calculated, because this depends mainly on the author's promptness, not the journal's.

Size of the Canadian Entomologist

There has been a substantial growth in size of the *Canadian Entomologist* in 1983 reflecting the greater number of manuscripts received. Most issues in 1982 and until April were 112 pages or smaller. In May to September this has grown to 128, 144, 160, 176 and 192. For October, 192 are planned but because of technical problems at the printing plant there will only be enough in galleys for 112 pages in November and possibly again in December.

Year	*Canadian Entomologist pages*	*Memoir pages*	*Total pages*
1983	1660 (estimated)	304	1964
1982	1215	708	1923
1981	1143	761	1904

Quality of papers

It is hardly fair to single out papers for comment but this year I cannot contain myself. Manuscript 6666 has 1049 pages of text and 617 pages of figures and captions. It was acclaimed by the reviewers and editors and is presently in the hands of the author for some editorial details. Manuscript 6666 is *The Fleas of Canada, Alaska and Greenland* by George P. Holland and should appear as a *Memoir* in 1984. This paper is the culmination of Dr. Holland's work and is destined to be the definitive work for many years to come. Congratulations, George!

Acknowledgments

I thank the Associate Editors, Reiny Brust, Conrad Cloutier, Bruce Heming, Bob Jaques, Robin Leech, Dave McMullen, Jeremy McNeil, Mukul Mukerji, Judy Myers, Ian Smith and John Steele. Dick Storch accepted a brief appointment; he filled in during Dr. Mukerji's illness and a recuperative trip to India. New Associate Editors are Dr. Brust, medical entomology and biting flies, and Dr. Myers, genetics and population ecology.

Charlie Miller continued to serve as Assistant Editor, sharing the work at Fredericton, filling in during my absence and soliciting reviews in forest entomology.

I thank Margaret McBride for yet another year of outstanding work.

I thank the many anonymous reviewers. I would like to list them, but in some very specialized fields this would amount to revealing their identity.

I thank you for the privilege of serving you another year and I regret that I must resign to give some attention to my own work. By the time this appears in the *Bulletin* a new Scientific Editor probably will have been found and the gradual transfer of responsibility underway.

Respectfully submitted,
D. C. Eidt

Publications Committee Report for 1983

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

Editorial Staff for the Canadian Entomologist

The following Associate Editors were appointed: R. A. Brust (Biting fly biology); J. H. Myers (Insect ecology and genetics).

Waiver of Page Charges for the Canadian Entomologist

Partial waivers of page charges were granted for three manuscripts consisting of a total of 19 pages. One application was rejected.

Book Reviews

Since the last report, 13 book reviews and 16 book notices were published in the Bulletin.

Promotion of ESC Publications

T. Galloway submitted a report to the Executive on policy for publication and promotion of ESC irregular publications. In the continuing effort to promote Arctic Arthropods he distributed copies to bookstores and supervised the production of an advertisement which will be distributed as recommended in his 1982 report to the Board. No sales resulted from the bookstore promotion.

Submission of Word Processor Discs to the Canadian Entomologist

The Committee recommended that for a trial period members of BRI submitting long manuscripts be encouraged to submit their revised text on word processing discs. The Managing Editor is supervising the test and will report on whether the procedure facilitates publication of long manuscripts.

Fixed Terms of Appointment for Associate Editors

Based on a suggestion from the Scientific Editor, the Committee recommends that Associate Editors be appointed to three-year terms with the possibility of re-appointment.

Possible Changes in the Editorial Structure of the Canadian Entomologist

The Scientific Editor's reminder to the Board that it might be difficult to find a volunteer to serve as Scientific Editor in the future stimulated the Committee to formulate, discuss and

report to the Executive on alternative editorial structures for the Canadian Entomologist. Given the importance of this matter to the Society, the Committee recommends that its report on alternative structures be published in the Bulletin so that members can consider the options and perhaps reach a consensus.

R. J. Lamb (Chairman)

Report of the Bulletin Editor for 1983

Bev Mitchell assumed the position of Assistant Editor, and I am grateful for his contributions towards production of the Bulletin.

Starting with the December 1982 issue, the Bulletin has published invited Guest Editorials. Their subject matter has ranged from specific areas of entomology to discussion on topics of interest to all biologists.

The December 1982 issue was the first to be produced by phototypesetting rather than from camera-ready copy. Adopting this method freed the Editor from the time-consuming responsibilities of lettering, cutting and pasting. However, it required moving the deadline for submissions forward by two weeks. Comments on the Bulletin's new format have all been favourable. However, the problem of a late delivery date to members of the ESC remains. Two large time lags need to be reduced. The printer (Hignell Printing Ltd., Winnipeg) is investigating ways to reduce the first one which occurs between the printer receiving corrected galley proofs and having all copies ready for shipping. The second large lag occurs from the time that copies are shipped to Ottawa from Winnipeg to the time that they are received by members of the ESC. This time could be reduced by mailing directly from the printer to members, and the Treasurer, Ed Becker, has received a proposal from Hignell Printing Ltd. for computer mailing services.

An advertisement, accompanied by an order form, for ESC publications was received and placed in the June Bulletin.

The Editor welcomes all suggestions for improving the Bulletin.

H. J. Liu
Editor, Bulletin of the ESC

Report of the Annual Meeting Committee 1983

The following is a synoptic account and a chronological timetable of events in preparing for the 1983 meeting held in Regina, Saskatchewan on October 3-5. The time span involved two years and eleven months; perhaps excessive to some but to the organizing committee it permitted ready scheduling, ample time for decision making, detailed planning, and timely execution of duties.

5 November 1980: The ESS made the decision to host the meeting in 1983.

10 April 1981: First organizational meeting at which a) The General Chairman and all subsidiary Committee Chairmen were appointed; b) the theme of the 1983 meeting was approved (IPM); c) two sites for the 1983 meeting were to be considered, i.e. the University of Regina or downtown Regina; d) all Chairmen were given copies of the duties of their respective committee.

17 April 1981: Requested information from other Societies on how to plan and conduct the annual meeting.

6 May 1981: obtained quotes from the University of Regina and the Sheraton Centre for meeting costs.

20 May 1981: Confirmation of meeting site at the Sheraton Centre for 1-5 October.

4 June 1981: Obtained quotes on printing costs of program, leaflets, tags, etc.

15 December 1981: Meeting to decide on symposia speakers; seven to be invited.

8 June 1982: Meeting at which the program was finalized, i.e. theme, symposia, speakers, call for papers, Gold Medal Lecture, Hewitt and Criddle Awards, abstracts, and struck a budget ($15,000).

1 October 1982: Meeting at which there was confirmation of all speakers, program, local arrangements; tentative entertainment suggested; registration arrangements made; printing and publicity in place.

16 December 1982: Update Meeting: Saskatchewan Government to sponsor banquet; City of Regina to sponsor reception; three booth spaces sold; finances confirmed.
22 December 1982: Meeting at which all items for the Annual Meeting were confirmed.
17 February 1983: Meeting at which a revised budget was presented indicating a small surplus.
31 March 1983: Meeting on updating all committee activities: program progressing; finances show more money coming in; local arrangements details settled; logos and printing updated for registration; first letter of invitation sent out.
2 June 1983: Meeting to report on progress: no changes in symposia, some papers in; details of meeting rooms finalized; banquet menu and speakers detailed; more money in and revised budget for surplus.
15 July 1983: Meeting to finalize all items; program assembled.
2 September 1983: Meeting: detailed review and inspection; program ready to be typed; selected chairmen for paper sessions, sent money to invited speakers, put all A.V. equipment in place; orders for coffee placed.
28 September 1983: Check and double check on all items.

P.W. Riegert (General Chairman)

1984 Annual Meeting Committee Report

Plans for the 1984 Joint Meeting of the Entomological Society of Canada and the Acadian Entomological Society are proceeding according to plan. The proposed schedule is as follows:

Meeting Place: Algonquin Hotel, St. Andrews, New Brunswick
Date: October 2 - 4, 1984
Theme: Resource Management
Governing Board:
Place: Same as above
Date: September 30 and October 1

The general outline is:

Plenary Symposium —Entomological perspective on resource management.
Other Symposia—Resource modelling.
Advances in biological control—a review.
Chemical control—state of the art.
Current endeavours in population dynamics.
Aquatic insects of Canadian wetlands.
Short courses—Modelling and computers.
Spray technology.
Submitted papers

The Programme Committee Co-Chairpersons are Dr. I.W. Varty and Dr. G. Boiteau. Mr. B. Pendrel is in charge of the local arrangements.

R.H. Storch (Chairman)

Science Policy Committee Report for 1983

At its Annual Meeting, held at the Embassy West Motor Hotel, Ottawa, on April 12, 1983, the Commitee reviewed its projects and related activities, considered its contacts with other organizations, and confirmed new initiatives.

The sub-committee brief regarding the need in federal government for a continuing entomological research component in relation to natural resources in Canada will be extended to include information on the employment of entomologists in agriculture, forestry, fisheries and oceans, and recreation and tourism. Information illustrating the economic importance and role of insects as presented at the Banff 1982 symposium will also be incorporated, as such data will support the contention that entomological research is exceedingly important to Canada's well being.

An abridged edition of the sub-committee brief on entomology curricula in Canadian Universities was published as an insert in the June, 1983, issue of the Bulletin. A complete report, including the appendices, will be distributed to institutions that contributed information.

A new sub-committee was appointed in March 1983 to study and prepare a brief on *Microbial insecticides: Their registration and use in agriculture, and public and animal health.*

Microbial insecticides will include bacteria, fungi, virus, microsporidia, nematodes and other related groups. The sub-committee held an organizational and work planning meeting at Willowdale in July and expects to complete the study in 1984. Hopefully, the brief will enlighten the public, politicians and interested government agencies about the value and hazards of these materials.

The Science Policy Committee reviewed results of contacts with the Minister of MOSST concerning government policy for funding of research and development (R & D). The Chairman was directed to again write and try to obtain additional information about points previously raised, and to reaffirm interests in the topics of concern. A letter was forwarded to the Minister on August 24, 1983.

The Science Policy Committee also contacted the Minister of the Environment and applauded the actions of his Department regarding an increase in funds for University Forestry Facilities, for teaching, and research and development. In a letter, the SPC stressed the need to direct a significant portion of the increased funding to entomological research.

The Science Policy Committee also contacted Agriculture Canada's ADM, Research, and noted the severe limitations on funding for attending Canadian and U.S. National Entomological Society Meetings. It was noted that Agriculture Canada follows Treasury Board recommendations of one scientist per conference per year from each of its five regions.

The Chairman also contacted the General Manager, AIC, to advise him of the existence of ESC's Science Policy Committee, and suggested a closer collaboration in an exchange of information on topics of common interest.

Reports were received from Society representatives (D. E. Bright—BCC AND S. B. Hill—AASC formerly SCITEC). D. E. Bright referred to a report in Bulletin 14(4): 121-222 and noted that Past President G. B. Wiggins had prepared a report for BCC on methods of recruiting professionals, the advertising of positions for the Public Services of Canada, and indicated how the system could be improved. The BCC has since published this report. It was also noted that BCC is trying to increase the number of biologists serving on the National Sciences & Engineering Research Council. S. B. Hill also referred to his report in Bulletin 14(4): 121 and commented on the first issue of AASC's new bi-monthly newsletter ACCESS. The Science Policy Committee recommends that, for the present, the Society should continue to support both organizations.

The "Dossier of Important Entomological Subjects in Need of Research in Canada" and the "List of Neglected Areas of Research in Entomology" were reviewed and updated. An article entitled, "Science Policy Committee: An Update and A Request for Assistance" was published in the Bulletin 1983, 15(2): 59. Progress to date, on proposed subjects in the dossier, was outlined and the list of proposed titles re neglected areas of research was included. Members were requested to participate by submitting additional subjects they felt should be added to this list, as the better informed the Board is, the more effective it is likely to be in acting on behalf of entomology and entomologists in Canada.

Matters of organization and operation centered around developing procedures relating to establishing Science Policy study groups. Guidelines were developed, accepted by the committee, and forwarded to the By-Laws, Rules and Regulations Committee for their consideration as to their suitability for inclusion in the Society's committee guidelines.

Future initiatives of the Science Policy Committee will be considered at the next annual meeting, provided present projects have reached a satisfactory stage of completion at that time.

Ray F. Morris (Chairman)

Report from CNC/IAWPRC (formerly: IAWPR) representative for 1983

The name of the association has been changed to "International Association on Water Pollution Research *and Control*," to more adequately reflect the applied aspect in addition to the continuing research mandate of this organization.

The nineteenth annual symposium will be held at the Canadian Centre for Inland Waters, Burlington, Ontario, in early 1984 (further announcements and call for papers to follow in various periodicals). Further, a specialized conference on Arctic Water Pollution Research is planned for May 1985 at Yellowknife, N.W.T.

E. Scherer

Report of the Representative to the Committee of Parliamentarians, Scientists and Engineers (COPSE) for 1983

The Committee of Parliamentarians, Scientists and Engineers is the successor to the Parliamentary and scientific committee which held a number of meetings in the Parliament Buildings between 1976 and 1979. Since 1980, the Committee has held several meetings per year; these seek to improve understanding between parliamentarians and the scientific and engineering communities of Canada, based on an appreciation of each other's concerns and aspirations.

COPSE has been organized partly through the offices of SCITEC, which during 1983 became AASC (Association for the Advancement of Science in Canada). Engineering and Scientific Societies, such as the ESC, are invited to send representatives to the COPSE meetings.

Five meetings were held during the 1982-83 session; an introductory dinner, hosted by Senator Jean Marchand, was followed by luncheon meetings on Transportation, Productivity, Forest management, and High technology and employment. Attendance was not large (maximum about 70 people), but included up to 30 parliamentarians from all parties and both Houses. The opening meeting featured several speakers, among them Dr. Stuart Smith, Chairman of the Science Council of Canada. There was general agreement that a more effective means was needed to allow scientifically informed non-partisan debate on matters of public concern. The idea of a joint Senate-Commons Committee for this purpose, with professional staff, attracted support.

Each luncheon meeting comprised a main speaker, a second speaker, and a period of discussion. The presentations varied in style and content, but many of the questions in subsequent discussions were asked by parliamentarians. During such discussions, scientific aspects received very little attention (although the importance of basic scientific work and understanding was pointed out from time to time). Most of the discussion considered the relation of economic and social policy to the relevant technology, and how to implement such policy.

COPSE is anxious not to be seen as lobbying for any particular cause, and views itself as a consciousness-raising organization; informal conversations at the time of the formal meetings are also useful in this regard. Nonethleless, the tone of the discussions is political and pragmatic. Engineers outnumber scientists at the meetings, as in the membership of COPSE (there are 115,000 registered professional engineers in Canada). Parliamentarians at the meetings comprise a small number (e.g. 10) who attend faithfully because they are particularly interested in science, and others drawn to individual topics of special interest to their constituencies. COPSE has an executive and a constitution, but is still developing its organization. It is too early to tell how effectively it will fulfil the stated aims over the long term, but I believe that the Society would do well to support this group as it tries to win the trust of parliamentarians and to encourage the development of some framework for improving informed public discussion of science.

H. V. Danks

Report of the Public Education Committee

During 1982-83 four affiliate societies applied to the ESC (via the PEC) for funds to support regional projects publicizing entomology. An allowance of up to $100/year (which can be "saved" for up to 3 years for a $300 lump sum payment by the ESC) may be requested by each of the seven affiliates. In the past two years there has been a significant increase by the affiliates in requesting these funds. I notified the ESC Secretary that the proper provision of funds for this purpose be placed as an item for discussion and action on the Board agenda this past April, and proper provisions to cope with these funds have now been made.

The Acadian Entomological Society has requested $100 for each of 1981, 1982 and 1983 for the purpose of publishing a history of agricultural entomology in the Acadian area (writing is completed by Mr. Frank Lord). Although this is a rather unusual purpose for these funds, I believe it may serve our ends admirably, and I recommend to both the Governing Board and the PEC that we disburse the funds for that purpose. Additionally, I feel the ESC should obtain a copy of the eventual publication for its Heritage Committee.

The CBC radio program IDEAS was recently soliciting material and personnel from academia in Canada to assist in generating new program material. President Ball suggested that the PEC look further into the question. The PEC wrote to IDEAS and received a reply

which explains how the program works. There was the gentle suggestion that a program on insects was not contemplated in the near future because of the IDEAS program, "The Biology of the Very Small" in December 1980. However, the right person with the right material probably would not find this a deterrent.

No further contact has been made by the PEC with the Science Writers' Association of Canada. Next year's PEC might consider sending either the same annotated directory of Canadian entomologists (or an updated version) to the Science Writers as a reminder.

Respectfully submitted,
A. D. Tomlin (Chairman)

Scientific Committee of the Biological Survey of Canada (Terrestrial Arthropods): Report for 1983

Details of the operations of the Scientific Committee are contained in the 1983 Annual Report to the National Museum of Natural Sciences, and have been summarized during the year in the Bulletin. A few of the main items may be noted as follows:

1. The Committee met in Ottawa on October 21-22, 1982 and April 14-15, 1983.
2. Drs. V. Behan-Pelletier, D. Larsen, D. Lehmkuhl and G. B. Wiggins were added to the Committee, replacing those retiring after a three year appointment.
3. The brief prepared by the Committee, entitled "Status and research needs of Canadian soil Arthropods" was sent to various academic departments, government agencies and persons across Canada.
4. At the Annual Meeting of the ESC/ESA/ESO held in Toronto in November-December 1982, there was a display outlining the Survey and its scientific projects. A symposium under the auspices of the Survey, entitled "Origins of the North American insect fauna" was organized. Formal discussions were also held with the ESA Committee on Systematic Resources.
5. The Committee invited a representative of the ESA Committee on Systematic Resources to attend the April meeting as an observer.
6. Additional numbers of the Newsletter were published.
7. The Committee hopes to arrange for a series of Survey publications through the National Museum of Natural Sciences.

G. G. E. Scudder (Chairman)

Report of By-Laws, Rules and Regulations Committee for 1983

The By-Laws, Rules and Regulations Committee did not meet as a full Committee during 1982-1983. The Chairman of the Committee assisted the Secretary in updating the Standing Rules and Committee Guidelines, as a result of actions taken at the 1982 Governing Board Meetings and the Annual General Meeting. The Chairman assisted the President in developing guidelines for new *ad hoc* committees which will be responsible for planning, directing and executing contracts for the Society.

N. D. G. White
D. M. Rosenberg
G. H. Gerber (Chairman)

Report of the Membership Committee for 1983

The Committee made the following recommendations to aid them in their duties and foster an increase in membership:

1. That the number of new members, the number of members resigning and the number of members dropped from membership for non payment be tabulated for each year in future and made available to the chairperson.
2. That the business office forward a copy of lists of names and addresses of regular members, honorary members, student members, Emeritus members, Fellows that are used for mailing.

3. That an updated copy of the complete constitution and by-laws be sent to committee chairperson.
4. That the society split the cost of the Canadian Entomologist from the cost of membership thereby reducing cost of membership.

   Rational: A/ Cost is a major impediment I encounter from prospective new members unless they need an outlet for their publications.

   B/ Most members have access to libraries and a personal collection of the Canadian Entomologist is redundant.

   C/ Computer awareness abstracting services and retroactive searches of literature available to many members limit the need to acquire a journal in which only a small percentage of papers are of direct interest and are easily found.

   D/ Basically, the cost of printing, and mailing the Canadian Entomologist to all members is prohibitive and I don't feel is warranted.
5. That next Membership committee with advice from Financial committee prepare a questionnaire for all members asking about their desire to receive the Canadian Entomologist and possible costs to them of both options.
6. That if the option to split membership from subscription is chosen, that title pages of the Canadian Entomologist be printed in the Bulletin.

Bryan D. Frazer (Chairperson)

Report of the Fellowship Selection Committee for 1983

The Committee selected 5 new Fellows from some 30 nominations. The ESC Board of Governors approved the selection, and the following will be honoured at the annual meeting of the Entomological Society of Canada in October, 1983:

A. E. R. Downe, Kingston, Ontario; J. E. McFarlane, Ste. Anne de Bellevue, P.Q.; R. D. McMullen, Summerland, B.C.; M. J. Tauber, Ithaca, New York; H. K. Townes, Ann Arbor, Michigan.

Respectfully Submitted,
R. A. Brust (Chairman)
A. Downes
K. McE. Kevan
A. MacPhee
B. J. R. Philogene
W. Wellington

Report of the Nominating Committee for 1983

The Nominating Committee was formed immediately after the annual meeting of the Society in December, the unusually late date brought about by the joint meeting with the Entomological Societies of America and Ontario. Geographic representation and long-standing familiarity with Society members and affairs underlay the selection of the Committee by the Chairman. All communications within the Committee were necessarily carried out by telephone.

Candidates of professional stature and other suitable attributes were selected by the Committee from the entire membership list, and a short list developed for each office. A slate of strong candidates was obtained, biographical summaries were requested and these forwarded directly to the Secretary.

The list of candidates was submitted to the Bulletin Editor for publication in the March issue.

Respectfully submitted,
E. G. Munroe
W. G. Wellington
G. B. Wiggins (Chairman)

Report of the Elections Committee for 1983

The Elections Committee consisted of Doug Barnes, Robin Stuart (for Tom Alloway) and Glenn Morris (Chairman). It met 19 July 1983 and examined ballots for the 1983 election of officers and for the proposed by-law change. Only ballots received before 15 July were tallied.

Ballots mailed: 940. Ballots cast: 408. Voting for more than the appropriate number of candidates or for both by-law options resulted in 3 spoiled ballots. On this basis rejected tallies were 3 for Second Vice-President, 1 for Directors-at-Large, 1 for Fellowship Selection Committee and 1 for Change to By-laws.

The successful candidates were:

Second Vice-President	H. F. Madsen
Directors-at-Large	R. F. Shepherd
	R. G. H. Downer
Fellowship Selection Committee	J. H. Borden
	W. G. Friend

The by-law was approved: 355 in favour of the change, 33 opposed.

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 1983

The Achievement Awards Committee received three nominations for the 1983 Gold Medal and one for the C. Gordon Hewitt Award. After careful consideration of all nominees, the Committee recommended that Dr. Freeman L. McEwen receive the Gold Medal and that the Hewitt Award not be given. This action was approved at the mid-term Executive Council Meeting held in Ottawa, Ontario, 12-13 April 1983.

A biographical sketch of Dr. McEwen was prepared and submitted with a photograph to the Editor, Dr. Helen J. Liu on 12 July 1983 for publication in the September 1983 issue of the ESC Bulletin. An additional outline with a photograph was sent to the Treasurer for preparation of suitable brochures for distribution at the Annual Meeting, Regina, October 3-5, 1983.

Press releases were prepared and circulated to the Editors of ten scientific publishing organizations, publicity offices of pertinent universities and industrial chemical companies, and appropriate local news media.

A call for nominations for the 1984 Gold Medal and C. Gordon Hewitt Award was placed in the September issue of the ESC Bulletin. To make our Achievement Awards program as meaningful as possible members are urged to submit nominations.

S. B. McIver

Report of the Scholarships Committee for 1983

Ten applications for the 1983 Post Graduate Scholarship competition were received by the Secretary by the deadline of June 15, 1983. Two additional applications were received at later dates and disqualified for this reason. There was a general agreement among Committee members that the academic qualifications of the candidates were exceptionally high with only one or two of borderline standing.

The two top ranked candidates were Richard J. Martin, University of Waterloo, R. G. H. Downer, Supervisor, with 81.3 percentage points, and Yves Bouchard, Laval University, C. Cloutier, Supervisor, with 75.0 percentage points.

The Scholarships Committee recommends that awards of $1,000 each be made to Richard J. Martin and Yves Bouchard.

R. D. McMullen (Chairman)

Report of the Employment Committee for 1983

The Employment Committee compiled and published the 1983 edition of the résumé booklet. The booklet contained 41 résumés (18 Ph.D., 16 M.Sc., 7 B.Sc.) and was distributed to employers of entomologists in Canada. It was sent directly to all institutions advertising employment opportunities and was made available to employers at the 1983 Annual Meeting in Regina. An employment service was also provided at the Regina meetings. The major

project of this committee during 1983 was conducting the manpower survey. All data have been collected, analyzed and the report is being written.

R. S. MacDonald, D. J. Madder (Chairmen)
S. Smith
G. Kinoshita

Report of the Heritage Commitee for 1983

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. Biographical sketches of winners of:
   a) Gold Medal for 1982
   b) C. Gordon Hewitt Award for 1982
2. Programs of Annual Meetings held in 1972, 1973, and 1982.
3. Abstracts of Papers presented at the 1980 meeting.
4. Awards Luncheon Menu, 1982.
5. Awards Presentation Brochure, 1982.
6. Letter of Greetings from P. E. Trudeau, 1982.
7. Letter of Greetings from A. C. Eggleton, 1982.

Although this assemblage of heritage items was small, the behind-the-scene activity was not at a standstill. The half-ton of documents—past files accumulated by the Secretary of the Entomological Society of Canada—are being sorted, identified, and evaluated. The task is a protracted one; some progress can be reported, but it will be some time in the future before any quantity or definitive material having archival significance, will be forwarded to the Public Archives of Canada. Hopefully more time can be found in the year ahead to do some significant selection from the pile of potential archival material on hand.

Respectfully submitted,
P. W. Riegert (Chairman)

Report of the Insect Common Names and Cultures Committee for 1983

Members of the committee are as follows:

E. M. Belton, Burnaby, B.C.
Paul Benoit, Ste. Foy, P.Q.
Harvey Craig, Saskatoon, Sask.
J. S. Kelleher, Ottawa, Ont.
R. O. Paradis, St. Jean, P.Q.
A. G. Robinson, Winnipeg, Man.
Paul D. Syme, Sault Ste. Marie, Ont.
L. S. Thompson, Charlottetown, P.E.I.
W. Y. Watson, Waterloo, Ont.

The Insect Common Names and Cultures Committee was instructed in 1979 to prepare and submit a list of English common names to parallel the official French list. The English list has been in preparation since that time and is now ready for submission to the Governing Board of the Society for their consideration. Inquiries are being made by the Entomological Society of Canada to the Society for the Protection of Plants in Quebec for the joint production of an official French-English list.

The preparation of the English list has been the work of the whole committee, and I should like to thank each member for a job well done. Any errors or omissions in the final preparation must be my responsibility.

W. Y. Watson (Chairman)

The Insect Common Names and Cultures Committee has copies of the revised list of English common names available for distribution to Society members on request. Members

are asked to advise the chairman of the Committee of any errors or editorial changes that are necessary before June 1, 1984. New name submissions must be made through the regular committee procedure.

Copies of the list may be ordered from W.Y. Watson, Chairman, Insect Common Names and Cultures Committee, Department of Biology, Wilfred Laurier University, Waterloo, Ontario, Canada. N2L 3C5

Report of the Insect Losses Committee for 1983

This Committee completed its work with the publication of "The Benefits and Costs of Controlling Destructive Insects on Onions, Apples, and Potatoes in Canada, 1960-1980."

I would like to thank all of the members of this committee for devoting time to this study and a special thanks to all those who provided data so that the study could be completed. I wish to thank especially Mr. Marvin Stemeroff and Dr. John A. George who served so effectively as the secretariat for this study.

F. L. McEwen (Chairman)

COMMITTEES OF THE ENTOMOLOGICAL SOCIETY OF CANADA

Proposed Members for 1983-84

Nominating		
G. E. Ball (Chairperson)	(403) 432-3237	Edmonton
P. W. Riegert		Regina
J. A. Shemanchuk		Lethbridge
Elections		
G. K. Morris (Chairperson)	(416) 828-5306	Mississauga
T. M. Alloway		Mississauga
F. M. Barrett		Toronto
Fellowship		
B. J. R. Philogène (Chairperson) (1984)	(613) 231-3949	Ottawa
A. W. MacPhee (1984)		Kentville
J. A. Downes (1985)		Ottawa
D. E. McE. Kevan (1985)		Ste. Anne de Bellevue
J. H. Borden (1986)		Burnaby
W. G. Friend (1986)		Toronto
Achievement Awards		
H. F. Madsen (Chairperson)	(604) 494-7711	Summerland
Annual Meeting		
R. H. Storch (Chairperson) (Regional Dir., Acad. E.S.)	(207) 581-7704	Orono
I. W. Varty (Co-Chairperson—Program)		Fredericton
G. Boiteau (Co-Chairperson—Program)		Fredericton
J.S. Kelleher (Regional Dir., E.S. Ont.)		Ottawa
T.D. Galloway (Regional Dir., E.S. Man.)		Winnipeg
By-Laws, Rules and Regulations		
N. D. White (Chairperson)	(204) 269-2100	Winnipeg
D. M. Rosenberg		Winnipeg
L. B. Smith		Winnipeg
Employment		
B. D. Prystupa (Chairperson)	(519) 824-4120	Guelph
D. J. Madder		Guelph
S. M. Smith		Toronto
Finance		
H. V. Danks (Chairperson)	(613) 998-9262	Ottawa
D. Barnes		Toronto
J.R. McLean		Vancouver
B.J.R. Philogène		Ottawa
A.C. Schmidt		Ottawa
H.J. Teskey		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 & Cultures		
W. Y. Watson (Chairperson)	(519) 884-1970	Waterloo
E. M. Belton (E.S.B.C.)		Burnaby
J. S. Kelleher		Ottawa
G. B. McNeil (E.S. Sask.)		Indian Head

P. Benoit (E.S. Que.)		Quebec
A. G. Robinson (E.S. Man.)		Winnipeg
L. S. Thompson (Acad. E.S.)		Charlottetown
P.D. Syme (E.S. Ont.)		Sault Ste. Marie
D.A. Craig (E.S. Alta.)		Edmonton

Membership

J. M. Campbell (Chairperson)	(613) 996-1665	Ottawa
H. B. Specht (Acad. E.S.)		Kentville
J. L. Auclair (S.E. Que.)		Montreal
J. Weintraub (E.S. Alta.)		Lethbridge
B. D. Roitberg (E.S. B.C.)		Vancouver
O. Olfert (E.S. Sask.)		Saskatoon
J. C. Conroy (E.S. Man.)		Winnipeg
G. B. Kinoshita (E.S. Ont.)		Willowdale

Public Education

A. D. Tomlin (Chairperson)	(519) 679-4256	London
J. D. Shorthouse		Sudbury
D. F. Hilton		Lennoxville
R. H. Storch (Acad. E.S.)		Orono
P. P. Harper (S.E. Que.)		Montreal
T. D. Galloway (E.S. Man.)		Winnipeg
J. S. Kelleher (E.S. Ont.)		Ottawa
D. A. Craig (E.S. Alta.)		Edmonton
P.W. Riegert (E.S. Sask.)		Regina
R. Alfaro (E.S. B.C.)		Victoria

Publications

R. J. Lamb (Chairperson)	(204) 269-2100	Winnipeg
P. Benoit		Quebec
C. Cloutier		Quebec
R. G. H. Downer		Waterloo
C. D. Dondale		Winnipeg
T.D. Galloway		Burnaby
J.P.M. Mackauer		

Scholarships

R. F. Shepherd (Chairperson)	(604) 388-3811	Victoria
C. Gillott (E.S. Sask.)		Saskatoon
J. P. Bourassa (S.E. Que.)		Trois-Rivieres
W. A. Charnetski (E.S. Alta.)		Lethbridge
L. Safranyik (E.S. B.C.)		Victoria
R. H. Storch (Acad. E.S.)		Orono
M. M. Chance (E.S. Man.)		Winnipeg
J. E. Laing (E.S. Ont.)		Guelph

Science Policy

S. B. McIver (Chairperson)	(416) 978-6955	Toronto
H. F. Madsen (V-Chairperson)		Summerland
D. E. Bright (B.C.C.)		Ottawa
S. B. Hill (A.A.S.C.)		Ste. Anne de Bellevue
O. N. Morris		Winnipeg
A. W. Thomas		Fredericton
A. D. Tomlin (Public Education)		London

Biological Council of Canada

S. B. McIver	(416) 978-6955	Ottawa
D. E. Bright	(613) 996-1665	Ottawa
R. G. H. Downer	(519) 885-1211	Waterloo

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

Manpower Study

F. L. McEwen (Chairperson)	(519) 824-4120	Guelph
C. R. Harris		London
D. J. Madder		Guelph
R. S. MacDonald		Toronto

Biological Control in Canada

J. E. Laing (Chairperson)	(519) 824-4120 (Ext. 3921)	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. B. Kinoshita		Willowdale

Biological Survey of Canada (Terrestrial Arthropods)

Scientific Committee

G. G. E. Scudder (Chairperson)	(604) 228-3168	Vancouver
G. 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
Ray F. Morris (President, ESC) or delegate		St. John's
G. A. Mulligan (Director, BRI) or delegate		Ottawa
D. M. Rosenberg		Winnipeg
I. M. Smith (BRI)		Ottawa
G. B. Wiggins		Toronto
D. D. Williams		Westhill

Secretariat

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

CALL FOR NOMINATIONS

Nominations for Election, 1984

The Nominating Committee (G. E. Ball, 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, Dr. H. G. Wylie, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba, R3T 2M9, not later than *30 April, 1984*.

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

Nominations for Fellowships, 1984

The Entomological Society of Canada Fellowship Selection Committee invites nominations for ESC Fellowships. To help the Committee with their selection, please supply as much pertinent information about the nominee as possible, on not more than 4 typed pages. The nomination must be signed by four members of the Entomological Society of Canada.

Please send by March 1 to B. J. R. Philogène, Chairman, ESC Fellowship Selection Committee, Department of Biology, University of Ottawa, Ottawa, Ontario K1N 6N5.

MISCELLANEA

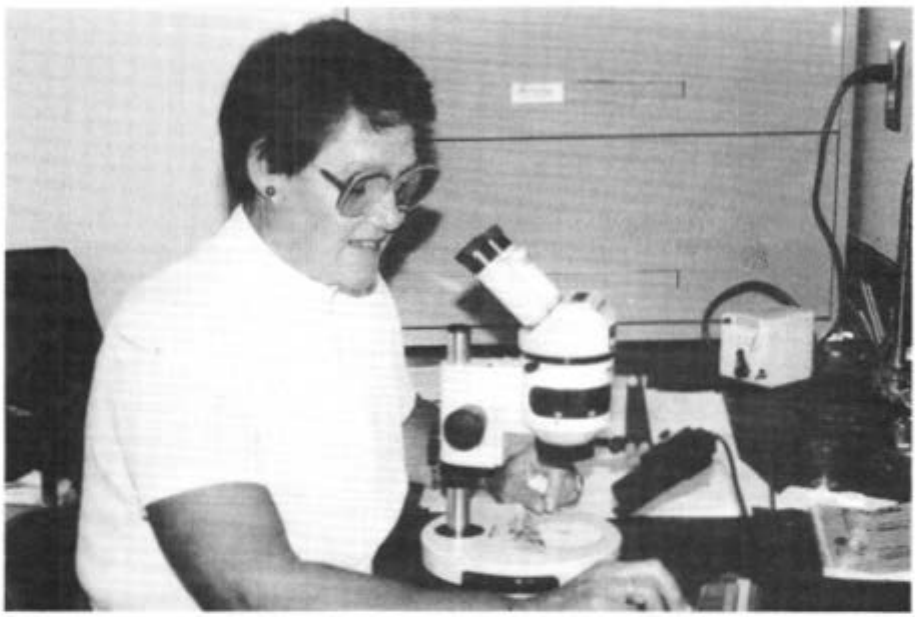
"Sixty-six thin *Ips* thrived throughout thick phloem.
Yet, six thick *Ips* thtarved in thin phloem."

Inspired by: R. A. Haack's paper "*Ips calligraphicus* (Coleoptera: Scolytidae) Reproductive Performance in Relation to Phloem Thickness and Temperature." Joint Meeting Entomological Societies of America, Canada, and Ontario, in Toronto, 1982.

Submitted by: Peter G. Kevan
Department of Environmental Biology
University of Guelph

RETIREMENT

H. J. "June" Herbert



H. J. "June" Herbert, the first woman agricultural research scientist studying phytophagous mites in Canada, retired this fall after 35 years as an Entomologist with Agriculture Canada.

A native of Berwick, Nova Scotia, she was the only woman in her class of 164 during her studies at the Nova Scotia Agricultural College. She earned her BSc in Agriculture at Macdonald College (McGill University) and worked at the former Dominion Entomological Laboratory in Annapolis Royal, N.S., before transferring to Kentville in 1950.

June was a pioneer in the study of the tiny orchard mite which was considered the number one pest of the apple orchard during the 1950's and the results of her work are accepted both nationally and internationally. She has related her findings and control recommendations in hundreds of talks to fruitgrowers and has published some 50 technical papers.

Her research focused on population dynamics, the relationship between predators and their prey, and included life history studies on the brown mite, red mite and two-spotted mite which rob the apple tree of nutrients and contribute to premature leaf fall and crop reduction. The results are being finalized in statistical form and when published shortly in the Canadian Entomologist, will clearly demonstrate the impact of the red mite on crop yield.

Ms Herbert has conducted phermone work with lepidopterous pests, including codling moth, bud moth and winter moth and recently completed a detailed, life history study of the spotted tentiform leafminer.

She has conducted extensive studies over the past two years on the chrysanthemum leaf miner which is causing damage in the millions of dollars within the North American greenhouse industry. Her findings show the leaf miner has a high degree of resistance to pesticides but practical controls can be achieved through the use of monitoring and control methods such as sticky boards and the trap crop concept.

Ms Herbert has made extensive use of the computer to prepare information models and project the balance of orchard mites and predators through the season as a basis for precise timing of control measures.

June has been president, secretary and treasurer of the Nova Scotia Institute of Science, and has held office or served on committees with such organizations as the Entomological Society of Canada and the Acadian Entomological Society.

As one of the women pioneers in agricultural research, she says she was treated fairly along the way and her advice to the career woman of the 1980's is to "get off your butt and work for it."

Her retirement plans include some travel and enjoyment of her home at Berwick, Nova Scotia and cottage at Black Rock, Nova Scotia.

PERSONALIA

Former ESC President, *Bill J. Turnock*, will be away from his duties at the Agriculture Canada Research Station in Winnipeg for a year. During that time he will be at the Imperial College (University of London) field station, Silwood Park, investigating overwintering survival of cabbage maggots.

Professor *John E. Laing* is currently Acting Chairman, Department of Environmental Biology, University of Guelph, Ontario.

NEWS OF ORGANIZATIONS

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

When I assumed the Presidency of the Council at the Fall meetings last year, activities were still very much centered around the question of government science [cf. the Davey report*]. Focal points were the questions of government hiring policies, and in particular the manpower initiatives of Agriculture Canada. There was a uniform response from the ministerial level on the question of government hiring practice, proclaiming an unerring faith in the Public Service Commission's procedures. While the policy was reiterated with predictable regularity, it became increasingly evident, however, that there is widespread dissatisfaction at lower levels in various sectors of government science and, further, there have been fairly frequent initiatives on the part of some directors to undertake their own searches for individuals for advertised positions in government science for which the Ph.D. is required. The BCC is continuing to argue that government should be required to advertise such positions in the usual scientific journals, as is the practice in universities, in order that all Canadians may be made aware of them. While we have gathered a number of case histories, it is evident that some non-Canadians have been hired into government scientific positions without prior advertising in what would be considered a conventional manner by the university sector, that is through advertising media such as Science and Nature. In order to focus our concerns on this question the BCC has developed, largely through the efforts of Dr. G. B. Wiggins, a document on government hiring practice which is now being widely circulated, and I am anticipating some interesting responses. It is unlikely that any change will be promulgated by government unless there is a continuing pressure on the Public Service Commission and parliamentarians from bodies such as the BCC.

In part related to this question of government hiring practice has been our follow-up with respect to the specific initiatives of Agriculture Canada. Agriculture Canada has predicted a manpower shortfall of some significance for the next several years, and as a consequence has developed a policy whereby training of researchers can be carried out through hiring them at the pre-doctoral or pre-masters level and placing them in universities. This is not a new practice in government science, but it is one which the BCC is questioning on several grounds. Firstly, Agriculture Canada's perception of the manpower shortfall has been arrived at largely through consultation with universities where there is a Faculty of Agriculture, and largely in ignorance of the potentially significant pool of agriculturally oriented scientists who are found in universities where no such agricultural schools exist, but where very active biological departments are producing well qualified graduate students. Secondly, the BCC has questioned the pre-selection of potential Ph.D. candidates from among students who have only just acquired the bachelor's degree. The difficulty of selecting such students is well known in the university circles. We view this question with two minds: in one we are supportive

*Davey, K. G. *Biological Research in Federal Laboratories*

of Agriculture Canada's thrust to train more young scientists in badly needed areas of research. On the other hand, however, we would like to see a much wider search for potential candidates, and some retraining initiatives. We have made some suggestions in our policy statement on government hiring practice, and will continue to pursue these avenues. The Past President and I attended the November CCUBC meetings in Ottawa, when the Assistant Deputy Minister of Agriculture Canada, Research Branch, Dr. E. J. LeRoux, spoke on his department's view of the manpower problem in Agriculture Canada. We detected then a certain amount of broadening of the net that is being cast across the country, but still not enough. On this point I should indicate that we are receiving tremendous support from the Canadian Association of Graduate Schools, who are themselves developing a position paper on this question. It is their view that all graduate schools should be addressed on this manpower shortage, not just those where Faculties of Agriculture exist. I am expecting to be able to report further on this over the next few months.

Ancillary to the Davey document on government science, and as a continued effort on the part of the BCC with respect to this document, I should add that the Past President and I were invited to attend the Canadian Agricultural Research Council meetings in Ottawa last December. It is credit to Davey that there appeared to be strong support for the document and the careful way in which it had been prepared.

At last November's Council meeting some major new issues were raised; these have occupied the greater part of my time since. The first has resulted in a joint Biological Council of Canada and Science Council of Canada survey of Canada's field stations. This survey, being conducted in collaboration with the Canadian Council of University Field Stations and the Canadian Council of University Biology Chairmen, is an essential first step towards development of policy concerning the management and future of Canada's field stations. In discussions with NSERC, with the Association of Canadian Universities for Northern Studies, and with the Canadian Council of University Field Stations it has rapidly become evident that Canada is desperately in need of such policy. The CCUBC has been extremely helpful, and is developing the university component of the survey, while the CCUFS will provide further back-up in this sector. Science Council has agreed to provide funding for a survey of government controlled field stations (Federal and Provincial); once this survey is completed it is expected that initial policy development will take place.

The second major issue concerns the question of reviving an Advisory Committee on Biology to NSERC. Many of you will remember that some years ago there was an Advisory Committee on Biology to NRC, which was disbanded when NSERC was formed. The BCC agreed that there are strong reasons for reviving the question of an Advisory Committee on Biology, among these our continuing dismay at the lack of biological representation on the Council itself or within the important advisory committees of NSERC, and secondly the initiatives being taken by NSERC to establish an Advisory Committee on Engineering, plus the existence of the NSERC Advisory Committee on Physics and Astronomy. I developed a proposal for the establishment of an Advisory Committee of Biology, modelled on the NSERC proposal for an Advisory Committee on Engineering. Further, an extensive list of names of potential members of such a Committee was provided, this having been developed in close collaboration with the constituent societies of the BCC. As a result of my initiative I met with the President of NSERC and senior NSERC officials in February, and I have been advised that the question and the proposals will come before Council at its May meeting. I am continuing to stress the importance of this Committee to NSERC. It is not enough for NSERC to say that biology continues to do well in granting, (which is a debatable point in itself). What is needed is a much better sense of direction and recognition of biology through stronger biological representation on Council and through the willingness of NSERC to listen to the advice of senior biologists who are, if one wishes, at arm's length from the actual Grant Selection Committees and the Strategic Grant Panels themselves.

The BCC continues, through the services of Dr. David Walden, to plan for the 1985 Canadian Congress of Biology to be held in London, Ontario. Various constituent societies are now beginning to suggest names for members to serve on program committees for the Congress, and I anticipate an acceleration of planning during the coming year. Any who wish to know more of the progress should contact Dr. Walden.

In the present year the BCC will be awarding its first Gold Medal, to Dr. Michael Shaw, University of British Columbia. Member societies are urged to promote this award as one of prestige and recognition of service to biology. Details of the award can be obtained from my office, or the Secretary of the BCC.

I anticipate a new policy development during the next year, concerning the 1973 proposal *A National Botanical Garden System for Canada*.* This proposal ultimately went to Cabinet

*R. L. Taylor and L. Laking, 1973.

through the offices of Agriculture Canada, but no action was ever taken. The principal reason for lack of action was the then price tag of $25 M. The BCC wants to assist in the reactivation of this far-sighted and important proposal, the more so in view of the implications of Recommendation 31 of the Report of the Federal Cultural Policy Review Committee (Applebaum—Hebert Report), that the federal government set up "federal heritage institutions such as maritime museums, arboretum . . . and botanical gardens." Mr. Alan Patterson, Director of the Royal Botanical Gardens in Hamilton has questioned this recommendation, since it overlooks the fact that such a centralized Botanical Garden could not conceivably be concerned with the preservation of all of Canada's plants, considering the diversity of our country, both regionally and climatically. The BCC is particularly concerned with activating one recommendation of the Taylor-Laking document, that of Germ Plasm Conservation and Preservation (objective 3). That component at least would seem to be feasible given the current times of restraint, since it is already a major activity of a number of the botanical gardens across the country. Early discussions are being initiated to see ways and means by which the BCC might develop a lobby concerning the National Botanical Garden System question.

I should report a few other activities relating to the BCC, and of interest to our constituent societies. As President I attended the inaugural meeting of the Association for the Advancement of Science in Canada in December 1982; the BCC is now a member of this essentially reorganized SCITEC. On another front we have been supportive of the Canadian Society of Microbiologists in their efforts to secure a major International Biotechnological Centre in Canada. This UNESCO funded venture is presently under discussion, and Canada was one of the countries which was conceived of as a potential location. I sent letters of support to Mr. McEachen's office. We have continued through our member-at-large Dr. G. M. Faubert to participate in the Ottawa Consortium, although there have been few issues in recent lobbies of direct concern to our constituents. I see our involvement, however, as important in that it continues to expose the BCC to the lobby scene in Ottawa. Finally, we offered support to a student symposium held at the University of Guelph on Certification in Biology, the focus of which was largely related to Wildlife Biology.

I wish to close on a note of concern to me and one in which I can promise the BCC will be taking some action. This relates to the question of what the BCC is and what it does, and may if you wish be described as an "awareness" problem. In order to correct this I am anxious to develop and improve means of communication with our member societies, both through the issue of more frequent statements on BCC policies and activities, and in particular through gaining a certain amount of space in constituent society newsletters. The BCC is currently developing an information brochure which will be distributed to all members of our constituent societies later this year.

The increasing need for the accountability of science places greater and greater pressure on all of us to make ourselves available to the general public and to be ready and able to explain what it is we are about. The BCC offers at least some relief to its constituent societies from this demanding issue, by acting as an initiator of policy on behalf of a wide spectrum of biologists, and by trying to bring respectability and awareness to Science both in government, universities and industry. It is important to remember that we are a voluntary organization and that all of us are under many other pressures in our jobs, but so far as we can I am confident that the Executive and Council members of the BCC are of one voice in their efforts to strengthen the image of Biology in Canada.

G. Robin South
President
April 1983

The Work of the International Commission on Zoological Nomenclature and its Importance in Applied Zoology

Zoology enquires into all aspects of the life and past history of animals and strives to build up a comprehensive and organized body of knowledge about them. Such knowledge is both gained and applied by cooperative effort. Hence, since no one person can have an expert knowledge of more than a small part of zoology, there are two essential requirements that are common to all. The first is a common basis of appreciation of the kinds of animals under study; the second is a common scientific nomenclature for use in referring to them by name.

To characterize and name animal taxa and arrange them in a hierarchical order that shows their relationships is the business of taxonomy. At present, some 1,100,000 species of animals, living and fossil, have been described and allocated to about 300,000 genera. About

15,000 new species and 2,000 new genera are described each year. Given that taxonomy involves the exercise of individual judgment, with numbers on this scale, mistakes and confusion are inevitable.

Environmental studies and research on the effects of natural and man-made changes in the environment on marine, freshwater and terrestrial ecosystems are growing in importance. Their dependence on correct identifications has focused attention on the value of taxonomy and on the inadequate regard in which it is held. An editorial in Marine Pollution Bulletin (6: 161-162, 1975) examined the neglected state of taxonomy and, among other recommendations, stressed the importance of systematics and taxonomy in the education of biologists.

Zoologists engaged in ecosystem evaluation face many difficulties in dealing with problems arising from marine pollution. They must study entire communities rather than single taxonomic groups, so that their approach must be basically ecological. Secondly, this requirement calls for an exceptionally broad knowledge of taxonomy and of techniques that call for ever increasing refinement and specialization.

Those responsible for taking decisions on anti-pollution measures will assume that scientific names in reports submitted to them are correct. The results of taxonomic work will nevertheless impinge sooner or later on applied work of every kind. Furthermore, history shows that important advances in taxonomic understanding were the result of advances in technology and field work. Pure and applied zoology are not segregated activities, and any attempt to make them so is harmful and self-defeating.

Zoology, like every other science, tends to progressive specialization. Taxonomy is the main integrator of the specializations and the preserver of the identity of zoology. Its status is therefore of concern to all and the maintenance of well staffed and equipped identification services is of the highest importance to successful work on pollution problems.

Zoologists use a common language to communicate with each other—the language of zoological nomenclature. The correct use of this language is no less important than correct taxonomic identification. The main purpose of this article on the work of the International Commission on Zoological Nomenclature is to emphasize the importance of two of the underlying principles of zoological nomenclature, to explain how the Code is regulated internationally, and to emphasize the critical condition of the machinery set up to effect this regulation.

Scientific names of animals and plants, which had formerly been more or less condensed descriptionss of species, were reduced to their present binominal form—one Latin or latinized word for the generic name and one for the specific—by the Swedish naturalist Linnaeus in the 18th century (for zoology in the 10th edition of his Systema Naturae in 1758). This work is accepted by international convention as the basic work in zoological nomenclature and no name published before 1758 can now be used. The first of the two main principles of binominal nomenclature is therefore the Principle of Priority. Starting from 1758, the first name given to a genus or species is the one that must be used. This may seem to be only common justice—indeed, common sense. The second main principle underlying zoological nomenclature is the Type Principle.

Obviously there must be a way of ensuring that a name is used with some continuity of meaning; if it is used in too many conflicting ways, it becomes useless as a means of communication. Each name is no more than a label for a taxonomic concept, and its correct usage can only be ensured by providing each concept with a type. A name must never be used so as to exclude the type of the taxon (or taxonomic concept) to which it is attached. For a species the type will normally be a single specimen, for a genus a single species. Each type serves as a permanent point of reference for verifying the correctness of each use of the name.

These two principles allow a zoologist to determine whether the correct (or valid) name has been used in an identification and whether that name has been correctly applied. Occasionally, he will meet a problem that he cannot solve for himself or to which there is no single answer. He then finds a need for some international bureau to which he can refer his problem and from which he can get a solution that has been reached by internationally agreed procedures and that is itself internationally acceptable. This bureau is the International Commission on Zoological Nomenclature, and the procedures are laid down in the International Code of Zoological Nomenclature.

The Commission was set up in 1895, originally for the purpose of replacing a multiplicity of codes of nomenclature by a single international code. The first such code was published in 1905. The rigidity inherent in any codified set of rules soon raised problems, especially in the application of an inflexible Principle of Priority. In 1913 the Commission was granted plenary powers to suspend the application of any rule in the Code when its application was judged more likely to produce confusion than stability, and it is largely in developing and refining its use of those powers that the Commission has contributed to the development of a stable and uniform nomenclature. The rulings that it gives on problems submitted to it are termed 'Opinions.'

Relatively simple cases where the plenary powers are used to suppress an unused senior synonym in the interest of stability usually requires bibliographic research and correspondence in preparing a watertight case for the Commission's decision. These make up less than a third of the problems presented. A larger group of cases includes those where a misidentification has become entrenched in the literature so that simply to correct the original error would throw taxonomic practice into chaos. Where the animals concerned are of economic or social importance, names that are household words may be affected. The amount of work involved in straightening out tangles of this kind may be formidable.

The Commission, whose membership varies from time to time in number and in countries of origin, now consists of 26 eminent zoologists from 17 countries. All its technical work is conducted by correspondence and by publication in the Bulletin of Zoological Nomenclature. Its work must be financed from some source, and it must have a legally constituted body to manage its financial affairs. This body is the International Trust for Zoological Nomenclature, which is a company without share capital registered under British law, and a registered charity.

The Trust's only regular source of income is the sale of its publications, the Bulletin and the International Code of Zoological Nomenclature. The Bulletin, because of its quasi-legal character, has a limited circulation of between 300 and 350 copies, almost exclusively to libraries. Its price is correspondingly high.

The main function of the Bulletin is to set out applications addressed to the Commission, to provide space for comments on them, and to publish the Commission's decisions. This does not help to increase its circulation.

Since 1979 the Trust has received: (i) three annual subventions of 5,000 pounds from the (UK) Advisory Board for the Research Councils, and (ii) two out of three promised annual subventions of $10,000 from the International Union of Biological Sciences. Both these sources of supply will have dried up by the end of 1982. The offices of the Commission's Secretariat are housed in the British Museum (Natural History) without charge, thanks to the generosity of the Trustees. All the members of the Commission and the Trust give their services free. Staff have accepted nominal salaries or honoraria for the last six years. It is important that plans for the future should cover the cost of employing full-time staff on a realistic salaried basis. If the current demand for the Commission's services is to be met, the annual cost of the Secretariat will rise from the present figure of about 15,000 pounds to about 50,000 pounds. If urgently needed developments of its work are to be undertaken, then the total cost would rise to about 65,000 pounds a year.

The Trust will shortly be launching an appeal directed both to zoologists at the individual level and to potential major sources of finance. It is hoped that your readers will contribute to the fund (as many members of the Trust already have) and whenever possible use their influence with official and private organizations to help ensure the success of these appeals.

R. V. Melville
Secretary, International Commission
on Zoological Nomenclature

Sir Eric Smith, CBE, FRS
Former Director, Plymouth Laboratory,
Chairman, Trustees of the British Museum
(Natural History)

ABRC (1979) Taxonomy in Britain. HMSO, London.
NERC (1976). The Role of Taxonomy in Ecological Research. Natural Environment Research Council Publication Series B. 14. HMSO, London.

MEETING ANNOUNCEMENTS

Joint Meeting *Entomological Society of Canada* and *Acadian Entomological Society*, at the Algonquin Hotel, St. Andrews, New Brunswick, on 30 September - 4 October 1984.
CONTACT: G. Boiteau, Agriculture Canada Research Station, P.O. Box 20280, Fredericton, New Brunswick E3B 4Z7. Telephone (506) 452-3260.

The *150th National Meeting of the AAAS* will take place 24-29 May, 1984, in New York City.
CONTACT: AAAS Meetings Office, 1101 Vermont Ave., NW, Washington, D.C. 20005. Telephone (202) 842-9530.

The *6th Biennial Plant Resistance to Insects Workshop*, at Charleston, South Carolina, on 21-23 February, 1984.
CONTACT: Kent D. Elsey, USDA ARS, U.S. Vegetable Lab., 2875 Savannah Hwy., Charleston, SC 29407.

40th Meeting *American Mosquito Control Association*, at the Harbour Castle Hilton, Toronto, Ontario, on 18-22 March, 1984.
CONTACT: G.A. Surgeoner, Department of Environmental Biology, University of Guelph, Guelph, Ontario N1G 2W1. Telephone (519) 824-4120.

Eastern Spruce Budworm Research Work Conference, in Orono, Maine, on January 10 and 11, 1984.
CONTACT: Stephen Oliveri, Maine Forest Service, State House Station #22, Augusta, Maine 04333. Telephone (207) 289-2791.

XXXVI International Symposium on Crop Protection, at the Faculty of Agronomy, University of Gent, Belgium, on 8 May, 1984.
CONTACT: Dr. W. Welvaert, President of the Organizing Committee, International Symposium on Crop Protection, Faculté des Sciences Agrochimiques, Coupure Links 653, B - 9000 Gent, Belgium

Symposium on Faunal Influences on Soil Structure, at the University of Alberta, Edmonton, Alberta, on 11-13 June, 1984.
CONTACT: C. V. Smyth, Faculty of Extension, 238 Corbett Hall, The University of Alberta, Edmonton, Alberta T6H 3E2.

VI International Symposium on Biological Control of Weeds, at the University of British Columbia, Vancouver, on 19-25 August, 1984.
CONTACT: Dr. Judith Myers, Institute of Animal Resource Ecology, 2204 Mail Mall, University of British Columbia, Vancouver, B.C., V6T 1W5.

Spruce Budworms Research Symposium, at Bangor, Maine, on 17-21 September, 1984.
CONTACT: CANUSA Symposium, Conferences & Institutes Division, University of Maine at Orono, 126 College Avenue, Orono, ME 04469, U.S.A.

International Union of Forest Research Organizations, working parties on *Population Dynamics* and *Scolytid Bark Beetles*, at Göttingen, West Germany, on 13-18 August, 1984.
CONTACT: Prof. S. Bombosh, Institüt für Forstzoologie, Universität Göttingen, West Germany.

XVII International Congress of Entomology, in Hamburg, West Germany, on 20-26 August, 1984.
CONTACT: Dr. Thomas Tischler, Zoologisches Institut des Universitat, Abt. Angewandt Okologie Kustenforschung, Biologiezentru, Olshansenstr. 40/60, D-2300 Kiel 1, West Germany.

I International Congress of Comparative Physiology and Biochemistry, in Liège, Belgium, on 27-31 August, 1984.
CONTACT: Professor R. Gilles, CPB Congress of IUBS, ESCPB Executive Office, Laboratory of Animal Physiology, University of Liège, 22, quai Van Beneden, B-4020, Liège, Belgium.

XI International Congress for Tropical Medicine and Malaria, in Calgary, Alberta, on 16-22 September, 1984.
CONTACT: Secretariat XI ICTMM, University of Calgary, Calgary, Alberta T2N 1N4.

PUBLICATIONS

Book Review

Mitton, Jeffrey B. and Kareen B. Sturgeon, Editors. 1982. *Bark Beetles of North American Conifers*. University of Texas Press, Austin, Texas. 527 pp. Hard cover $U.S. 30.00, paperback $U.S. 17.50.

From weevil ancestors Scolytidae evolved with woody plants until every species of conifer, and most broadleafed species, was utilized by one or more of the 6,000+ known bark and ambrosia beetles. Fungal competitors of primordial scolytid beetles became allies, which helped beetles conquer their host by aggressively invading the tree's vascular system, or served as the principal food. In turn, beetles evolved special mycangia in which the fungi are transported, nurtured and protected. The powerful beetle-fungal alliance became the hub of a community of insect predators, saprophytes and other camp-followers; more than 100 species of organisms may be included in a churning collection created by successful invasion of a tree.

Primitive Scolytid species apparently did and still do rely primarily on odorants peculiar to the moribund trees to locate breeding material and mates. Pheromones were probably used to identify mates at close range and possibly to insure adequate breeding space between individual females. Among the more advanced species, pheromones are used to signal the location of the breeding site and to synchronize attack so that the small predator—the beetle, can overcome a large prey—the tree. Other pheromones signal acquiescence of the host and deflect surplus attackers to another tree. Interspecific chemical communication facilitates niche partitioning and cooperative attack of different bark beetle species and attracts other families of insects to the colonized tree.

The efficiency of the Scolytidae as natural enemies forced evolution of resistance mechanisms in trees. Ploy and counter ploy focused genotypes of the beetle and the tree and probably resulted in radiative speciation of both. Reconverging groups which developed specializations in allopatry either introgressed to produce a broadly adapted heterozygous polyphag (e.g., mountain pine beetle) or protected its genotype with premating isolating mechanisms to remain a narrow specialist (e.g., Jeffrey pine beetle).

As saprophages and opportunists, Scolytidae are the vanguard of an organismal complex that degrades recently fallen and moribund trees. As predators, bark beetles may kill individual trees or entire forests. The ecological effects of these actions include recycling of nutrients, clearing of the ground, accelerating succession, and renewing of the forest. However, it is the economic impact of the enormous losses of timber volume and value that has stimulated thorough research of this group.

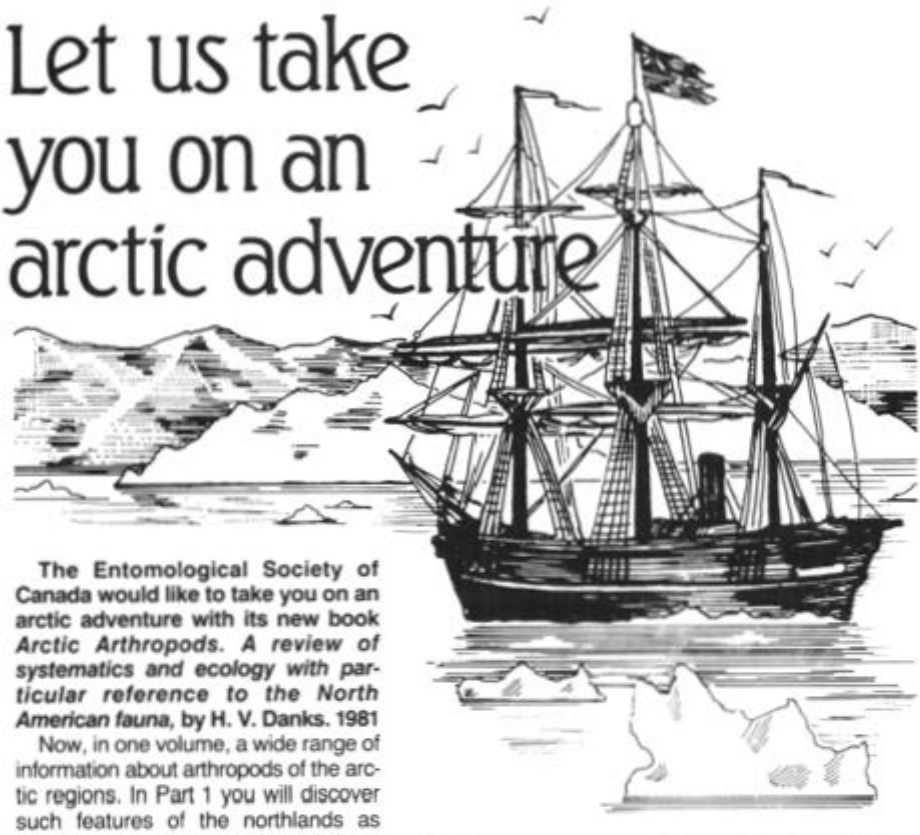
Bark Beetles of North American Conifers is a comprehensive collection of ten chapters by a dozen authors, all of whom have contributed importantly to their subject areas. Editors Jeffry Mitton and Kareen Sturgeon connect the contributions with an evolutionary theme through their opening chapter, *Biotic Interactions and Evolutionary Changes*. In the second chapter, R. W. Stark presents *Generalized Ecology and Life Cycle of Bark Beetles*, illustrated by specific statements in which there are several errors. A statement that "all conifers and most hardwoods are hosts" (page 24) could apply to the family Scolytidae but not to the genus *Dendroctonus*. While it is true that conifer-infesting ambrosia beetles are restricted to the boles of recently dead and moribund trees (page 24) some hardwood utilizing genera (*Corthylus, Xylosandrus*) infest live trees and saplings. Chapter 3, *Taxonomy and Geographic Variation*, by D. E. Bright and M. W. Stock, reviews the taxonomic organization of the family and the development of its current classification, complete with bits about important contributors and species complexes that need additional study.

Aggregation Pheromones (Chapter 4), by J. H. Borden, is an elegant compendium of almost all of current knowledge of chemical communication in the Scolytidae. This subject has been reviewed frequently, but never as well. In Chapter 5, D. L. Dahlsten presents *Relationships Between Bark Beetles and Their Natural Enemies*. The identities of the actors in several bark beetle communities are quite thoroughly known but understanding of the cryptic play they perform is rudimentary. The reader may be bewildered by an array of binomials without indication of their higher classification (family, Order) and he/she may be bored by minor redundancies.

In *Bark Beetles and Symbiotic Organisms* (Chapter 6), H. S. Whitney concentrates on the intricate mutualistic beetle-fungus relationship but includes interactions of other microbes in the community. R. G. Cates and H. Alexander review the antibiotic mechanisms of plants against insects in *Host Resistance and Susceptibility* (Chapter 7). The process of resinosis in conifers attacked by bark beetles is especially intensively examined. A. A. Berryman draws a lucid picture of *Population Dynamics of Bark Beetles* in Chapter 8. Chapter 9, *Integrated Management of Bark Beetles*, by R. N. Coulson and R. W. Stark, stresses that control of losses of timber to bark beetles should be based upon sound silviculture. While forest entomologists are in general agreement with this viewpoint, these authors seem not to appreciate Berryman's (Chapter 8) concept of the persistance of the outbreak phase in a healthy stand due to a population increase following a precipitating event such as drought or windthrow.

The final chapter, *Evolution of Bark Beetle Communities*, by Sturgeon and Mitton, applies some of the current literary thought on speciation and co-evolution to Scolytidae, especially the mountain pine beetle, *Dendroctonus ponderosae*. This reviewer finds more

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.

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arguments with this chapter than the rest of the book. Large generalities are extrapolated from a rather small quantity of data (mostly their own studies). Hopkins' "Host Selection Principle" seems to be revived without evidence to support it. Overlooked was the powerful conservative effect of aggregation pheromones which must continually promote mating among demes that have undergone some selection for living in particular hosts, as discussed by Bright and Stock in Chapter 3.

The book is concluded by a useful glossary, an index, and 102 pages of references. There are minor faults such as the use of binomials that are inconsistent with the recent authorative taxonomic monographs and overuse of "perturbations" in Chapter 9, but overall, this is a fine book. It will be of special interest to forest entomologists, population biologists and evolutionists. It is good reading for any biologist and, furthermore, it is refreshingly priced.

Gerald N. Lanier
SUNY College of Environmental
Science and Forestry
Syracuse, New York

Book Notices

Brooks, Robert W. 1983. *Systematics and Bionomics of* Anthophora: *The* bomboides *Group and Species Groups of the New World (Hymenoptera: Apoidea, Anthophoridae).* University of California Publications in Entomology, Volume 98, pp. i-x, 1-86. University of California Press, 2223 Fulton Street, Berkeley, CA 94720. Soft bound. $U.S. 8.50.

This work details nesting and related behaviour in the stingless bees forming the *bomboides* group, and presents anatomical keys, redescriptions, and range maps for the 5 species and 5 subspecies (of *A. bomboides*) found in North America. Keys to related Western Hemisphere species groups in *Anthophora* are also given. Relationships and biogeography of the *bomboides* group form an appendix.

C. D. Dondale
Biosystematics Research Institute
Ottawa, Ontario

Coats, J. R., Editor. 1982. *Insecticide Mode of Action.* Academic Press, New York. 470 pp. $U.S. 59.50.

This volume consists of 12 chapters contributed by different authors on a series of topics related to insecticide mode of action. The first section includes one chapter on the pyrethroids, two on the chlorinated hydrocarbons, one on the carbamates and two on the organophosphates. The second section contains three chapters on the formamidines and the third section contains one chapter on each of chitin synthesis inhibitors, juvenile hormone analogues, precocenes, and xanthene dyes.

Many chapters contain useful information in up to date and readable reviews. However, as is often the case with this sort of monograph, the selection of topics seems at times somewhat arbitrary. For example the only carbamates discussed are the oxime carbamates. The phosphoramidates are given an entire chapter, but no other organophosphate group is. The pyrethroids are covered in a single chapter while the formamidines are given three. The variability in length of chapters is another indication of unevenness and lack of coordination in treatment of subject matter. The two shortest chapters deal with structure-activity relationships of DDT analogues and toxic and behavioral effects of Chlordimeform on the American cockroach. These are both approximately 10 pages long. On the other hand, the chapters on structure-activity relationships of phosphoramidates and juvenile hormone analogues are both over 50 pages in length.

The volume is a useful update in the selected areas it addresses, but the generality of the title could be misleading.

P. A. MacKay
Department of Entomology
University of Manitoba
Winnipeg, Manitoba

Georghiou, G. P. and T. Saito, Editors. 1983. *Pest Resistance to Pesticides*. Plenum Press, New York and London. 809 pp. $U.S. 89.50.

This volume consists of 32 separate contributions made at a seminar of U.S. and Japanese scientists in 1979 and published together as a monograph in 1983. The 6 papers in the first section, Origins and Dynamics of Resistance, are useful general reviews of the field from a number of different perspectives. The second section, Mechanisms of Resistance, consists of 18 papers discussing a variety of rather specific topics and making no attempt to cover all aspects of the field. The third section, Suppression and Management of Resistance, contains 8 papers on a mixture of general and specific topics.

Although insects make up by far the majority of the subject matter, the volume also deals with other arthropods and with weeds and diseases as well. This is a useful approach since a consideration of the similarities and differences in responses of the different pest groups is bound to lead to new insights.

For anyone in the field of pesticide resistance research, the volume is probably too out of date to be particularly useful. However, for those more peripherally involved many papers will be very useful, particularly those reviewing the broader aspects of the field.

P. A. MacKay
Department of Entomology
University of Manitoba
Winnipeg, Manitoba

Gibbs, George W. 1980. *New Zealand Butterflies: Identification and Natural History*. William Collins Publishers Ltd., P.O. Box No. 1, Auckland, New Zealand. 207 pp. Hard cover. $U.S. 45.00.

The very small size of the butterfly fauna of New Zealand has enabled the author to produce a book whose depth of information is rather mind-boggling to one accustomed to the North American literature. After an introductory chapter on trans-Tasman migration, the book discusses, in great detail all 23 species, with emphasis on their identification, ecology and life-history. There are distribution maps for all species and information on the full range of the 12 non-endemic species, and adult, larval and pupal identification keys. The 197 colour plates, almost all of live specimens of all stages and the 16 SEM photographs are of the very highest quality.

Ross A. Layberry
Ottawa, Ontario.

Hafernik, John E., Jr. 1982. *Phenetics and Ecology of Hybridization in Buckeye Butterflies (Lepidoptera: Nymphalidae)*. University of California Publications in Entomology, Volume 96. University of California Press, 2223 Fulton Street, Berkeley, CA 94720. 109 pp. $U.S. 16.50.

This paper examines relationships among the three North and Central American "species" of *Junonia: J. coenia, J. nigrosuffusa* and *J. evarete zonalis*. It contains chapters on intra- and interspecific crosses, courtship behaviour, population structure, larval resource partitioning and phenetics, along with 15 tables and 35 figures.

Ross A. Layberry
Ottawa, Ontario.

Hely, P. C., G. Pasfield and J. G. Gellatley. 1982. *Insect Pests of Fruit and Vegetables in New South Wales*. Inkata Press, Melbourne. 312 pp. $ Aust. 40.00.

This beautifully illustrated book describes the diverse pest fauna of fruits and vegetables in New South Wales, Australia. Its aim is to instruct and serve as a reference book for "primary producers, students, agricultural extension officers, entomologists and home gardeners." Given the large differences in climate between Australia and Canada it is unlikely that this book will be useful to Canadian entomologists. However, it could serve as a worthy example for entomologists wishing to compile a similar type of book for a Canadian audience.

R. J. Lamb
Agriculture Canada Research Station
Winnipeg, Manitoba

Kelton, Leonard A. 1982. *Plant Bugs on Fruit Crops in Canada. Heteroptera: Miridae*. Agriculture Canada Monograph No. 24, 201 pp. $11.25 in Canada; $13.50 in other countries.

Plant Bugs on Fruit Crops . . . provides another step in increasing and summarizing our knowledge of the largest and most economically important family of true bugs or Heteroptera, the Miridae. Leonard Kelton follows up his excellent *Miridae of the Prairie Provinces of Canada* (1980. Agric. Canada Publ. 1703, 408 pp.) with a more detailed and specialized study of some of the most important and more interesting plant bugs. Eighty-one species in 34 genera associated with cultivated and wild fruit crops are treated. Of these, 67 species are represented by a full-page, dorsal habitus drawing. Each species is accompanied by an adult diagnosis, a list of hosts, distribution in Canada, and notes on biology and seasonal history. Easy-to-use keys to subfamilies, tribes, genera, and species are offered, making it simple even for the nonspecialist to identify pests or predators with reasonable certainty. In the general introduction, indications of disease transmission, reduction of plant vigor, and deformed and dropped fruit are but a few reasons given to warrant continued investigation of the Miridae. It might be surprising to some that of the 81 included species, 47 are considered predatory, only 24 are thought to be entirely phytophagous, and another 10 probably share both feeding habits. The *Collecting and Preserving* section stresses the necessity to handle the infamously delicate plant bugs with care (every collector should take careful notes). An appendix giving common and scientific names of plants is supplemented by a second listing of plants and the plant bugs recorded from each. Combine all of this information with a good bibliographic introduction to the taxonomic and economic literature and you have a book useful to anyone interested in fruit-crop pest and insect predators in North America.

Thomas J. Henry
Systematic Entomology Laboratory
Science and Education Administration,
USDA
c/o U.S. National Museum of Natural History
Washington, D.C.

Ramsay, Graeme W. and Pritam Singh. 1982. *Guide to New Zealand Entomology*. Bulletin of the Entomological Society of New Zealand, No. 7. 72 pp. Order from Dr. G.W. Ramsay, Librarian E.S.N.Z., c/- Entomology Div., D.S.I.R., Private Bag, Auckland, N.Z. Soft cover. $N.Z. 9.00.

This guide is utterly packed with information about the people, organizations, and writings concerned with insects and arachnids in New Zealand. Conceived by the authors as they daily car-pooled to work at the Mt. Albert Research Centre in Auckland, the book is intended to provide a key to entomological activity, both for amateurs (including children) and for professionals or visitors to the Country.

What are the latest books on N.Z. butterflies? Who currently researches scarab biology? Which insects and arachnids are legally protected in N.Z.? Where can a course in entomology be found? Who identifies beetles, flies, spiders, millipedes, or whatever you've caught? The answers to these and many, many more questions are all here, authoritative and neatly arranged. Cartoons, mainly of the punning kind, relieve the solemnity of the book.

C.N. Dondale
Biosystematics Research Institute
Ottawa, Ontario

New Books and Publications

Archives of Insect Biochemistry and Physiology. Volume 1, 1983/84, four issues. Alan R. Liss, New York.

Computing in Biological Science. M. J. Geisow and A. N. Barrett, Eds. Elsevier, New York, 1983. xxii + 446 pp. $U.S. 68.00.

Crop Protection. An international journal of pest, disease and weed control. Butterworth Scientific Ltd. Woburn, MA, 1982.

Drawings of New Zealand Insects. D.W. Helmore. Bulletin of the Entomological Society of New Zealand, No. 8, 1982. 52 pp. $N.Z. 11.50.

Endocrinology of Insects. Invertebrate Endocrinology, Volume 1. R. G. H. Downer and H. Laufer, Eds. Alan R. Liss, New York, 1983. 714 pp. $U.S. 146.00.

Flies of the Nearctic Region, Volume V. Homeodactyla and Asilomorpha, Part 13, No. 3, Bombyliidae. J. C. Halland and N. L. Evenhuis. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 1982. $U.S. 36.96.

Herbivorous Insects. Host-Seeking Behaviour and Mechanisms. S. Ahmad, Ed. Academic Press, New York, 1983. 264 pp. $U.S. 34.50.

Insect Pheromones. M. C. Birch and K. F. Haynes. Edward Arnold, London, 1983. 60 pp. $U.S. 10.00.

Integrated Mosquito Control Methodologies. Volume 1. M. Laird and J. W. Miles, Eds. Academic Press, New York, 1983. 388 pp. $U.S. 56.00.

The Mosquitoes of British Columbia. Handbook No. 41, British Columbia Provincial Museum, Victoria, 1983. 189 pp. $5.00.

Photographing Insects: A Bulletin for Entomologists and Photographers. B. B. Given. Bulletin of the Entomological Society of New Zealand, No. 6, 1982. 32 pp. $N.Z. 5.00.

The Resistance of Agricultural Pests to Control Measures. Council for Agricultural Science and Technology (CAST) Report No. 97. CAST, Ames, Iowa. 18 pp. $U.S. 2.00.

Revision of the African Whiteflies (Aleyrodidae), Mainly Based on a Collection from Tchad. R. M. Bink-Moenen. Monografieën van de Nederlandse Entomologische Vereniging, No. 10, 1983. 211 pp.

Update on Publications

The following is a list of Biological Council of Canada publications:

1. University Research in The Biological Sciences: The Urgent Need For Increased Funding. Statement by the Biological Council of Canada. January 1975.
2. Biology in Canada: Retrospect and Prospect. A Brief by the Biological Council of Canada submitted to the Senate Special Committee on Science Policy. February 1976.
3. Tomorrow's Biology? A National Statement on Basic Biology in Canadian Universities. 1976.
4. Biological Council of Canada. A Brief submitted to the Secretary of State of Canada on Museum Collections and Canadian Science. Toronto, June, 1977.
5. Biological Council of Canada. A Brief submitted to the Miscellaneous Estimates Committee, House of Commons on Bill C-26. March, 1977.
6. A Brief on Canadian Science Journals published by the National Research Council of Canada to the Prime Minister of Canada, submitted by the Biological Council of Canada. October 1977.
7. A Brief to The Task Force on National Unity, submitted by the Biological Council of Canada. April 1978.
8. Towards Integration and Maximization of Resources Applied to Research and Development in Canada. A Discussion Paper, submitted by the Biological Council of Canada. October 1978.
9. Biological Council of Canada, A Proposal to Establish the Agricultural Research Council of Canada. December 1978.
10. Biology, Biologists & Government, a presentation to the President and Members Natural Sciences and Engineering Research Council, submitted by the Biological Council of Canada, December 1978.
11. Biological Council of Canada, Invitational Symposium. Biotechnology: What Directions for Canada. Proceedings of a Symposium held in Ottawa on October 23, 1980.
12. Biological Research in Federal Laboratories by K. Davey. Prepared on behalf of Biological Council of Canada, April 1982.
13. A Statement on Hiring Policy for Scientists in the Federal Government. April 1983.

Copies of recent publications can be obtained from the office of the BCC President: Dr. G. R. South, Department of Biology, Memorial University, St. John's, Newfoundland, A1B 3X9.

Flea News is a publication for Siphonaptera specialists. Further information may be obtained from R. E. and J. H. Lewis, Department of Entomology, Iowa State University, Ames, Iowa 50011, U.S.A.

Information Apterygotologiques may be obtained from Laboratoire d'Ecologie Generale, Brunoy, France.

Tymbal, for Auchenorrhyncha specialists, began publication in April 1983. Contact M. Wilson, Commonwealth Institute for Entomology, 56 Queen's Gate, London SW7 5JR, England.

GRADUATE STUDENT POSITION

A graduate position is available at the Ph.D. level in Entomology, to work on mosquito vectors of Western Equine Encephalitis. The main emphasis of the research is directed toward field populations of *Culex tarsalis*—autogeny, parity rates, diapause, gonotrophic dissociation. Stipend $8,800.00 annually. Position available January 1, 1984. Apply to Dr. R. A. Brust, Department of Entomology, University of Manitoba, Winnipeg, Manitoba R3T 2N2.

OBITUARIES

George Tamaki 1931-1983

George Tamaki, Research Leader and Research Entomologist of the Agricultural Research Service's, Yakima Agricultural Research Laboratory, died July 10, 1983, of a heart attack. George was at the height of a distinguished career with the United States Department of Agriculture when he was struck down at the age of 52.

He was born in Los Angeles, California, on March 20, 1931, and attended the University of California, Berkeley, where he received a BS in 1960 and a Ph.D. in entomology in 1965. Upon completing his graduate studies he accepted a position as a research entomologist with the Yakima laboratory, where he spent his entire career.

Throughout his career, George maintained a strong interest in sound biological and ecological approaches to agricultural pest control, with emphasis upon the green peach aphid, the Colorado potato beetle, and the red-backed cutworm, among others. George authored over 90 publications covering a broad spectrum of research interests emphasizing his biological and ecological approaches. He was recently honored for his outstanding achievements in entomology as the 1983 receipient of the C.W. Woodworth Award of the Pacific Branch, Entomological Society of America.

In 1979, George was appointed Research Leader of the Vegetable and Field Crops Insects Research Unit and in 1981 Research Leader of the Insect Ecology and Behavior Research Unit. He also served as a USDA Technical Advisor for Vegetable Insects Research.

In addition to his research, George had an abiding interest in the education and training of students. He served as Adjunct Professor of Entomology at Washington State University and was a member of the Graduate Faculty at Oregon State University. In both capacities he guided the academic and research programs of a number of master's and doctoral students.

George was active in supporting international cooperation in entomological research, with programs in India, Pakistan, Poland, and Israel. He most recently represented ARS-USDA as a member of a team developing a cooperative research exchange program with Hungary. He was active in a number of professional societies, including The Entomological Society of America, The Entomological Society of Canada, The Washington State Entomological Society, and The Entomological Society of British Columbia.

George is survived by his wife, Mildred; a son, Blaine; and a daughter, Dawn; all of whom live in Yakima.

Although we have lost a valued friend and esteemed colleague, his influence will be felt for many years to come through the accomplishments of his colleagues and students, with whom he had such a warm, caring relationship.

A scholarship fund in George's name has been established at Washington State University. Contributions may be made out o the George Tamaki Memorial Scholarship Fund, and

sent in care of the Yakima Agricultural Research Laboratory, ARS-USDA, 3706 W. Nob Hill Blvd., Yakima, WA 98902.

H.R. Moffitt
A.K. Burditt, Jr.
Yakima Agricultural Research Laboratory,
ARS-USDA
Yakima, WA 98902, U.S.A.

Roy Mason White 1888-1983

R.M. (Sam) White died on February 4, 1983 at Resthaven Retirement Home, Penticton, B.C. Sam was a prominent entomologist in the Canadian Prairie Region from 1922-1948 and was an Honorary Life Member of the Entomological Society of Alberta.

Sam was born near Darlingford, Manitoba on December 15, 1888, attended school at Morden, Manitoba, obtained a B.S.A. from the Manitoba Agricultural College in 1924, and a M.Sc. from MacDonald College in 1927. He served in the First World War with the 27th Battalion C.E.F. from 1914-1918, participated in some of the fiercest battles at St. Eloi, the Somme, Vimy Ridge, Hill 70 and Passachandale, was wounded three times and won the Military Medal and Bar.

Sam began his entomological career with Norman Criddle at Treesbank, Manitoba, in 1922. Criddle's tutelage sparked a tremendous interest in Sam in all things biological and he became an excellent all-round naturalist. Sam spent the winter of 1930-1931, at Saskatoon, then transferred to Lethbridge, where he remained until his retirement in July 1948. At Lethbridge he was in charge of grasshopper investigations and contributed greatly to knowledge concerning biology, ecology, distribution, and population forecasting, of economic species.

Sam's work was always carefully done and has stood the test of time as Hardman and Smoliak (1980) published on the potential economic impact of rangeland grasshoppers based on annual samples of grasshoppers collected and identified by Sam from 1928-1944. In addition to grasshoppers Sam maintained an interest in Coleoptera, Botany, and Ornithology.

On retirement in 1948, Sam and Mrs. White moved to Summerland, B.C., where he continued his hobby of flower growing, especially irises, gladioli, and dahlias. He produced many new varieties of irises and was well known in this field in Canada and the United States.

Sam was a dedicated scientist, an ardent horticulturalist, and an energetic and enthusiastic naturalist.

L.A. Jacobson (retired)
A.M. Harper
Agriculture Canada Research Station
Lethbridge, Alberta

RECENT DEATH

Mrs. H.L. (Mick) Seamans. On 21 October, 1983, aged 91. Widow of Dr. H.L. Seamans, Field Crops Entomology, Agriculture Canada.

Editor's Remarks

This Bulletin issue contains articles pertinent to our relations, as a Society and as individuals, to other professional organizations. Singled out is the Biological Council of Canada which we are all supporting financially through our membership fees, but for which our moral support has waxed and waned over the past few years. Dr. Wiggins' editorial and Dr. South's presidential report aim to inform us of the role and functions of the BCC, and should assist us in understanding the rationale behind our Society's involvement with this umbrella organization.

I also wish to draw the attention of readers to a report from another organization, and one whose work is of immense value to every entomologist, namely the International Commission on Zoological Nomenclature. The Trust which manages the financial affairs of the Commission will shortly be launching an appeal for the funds which are urgently needed for the work of the Commission to continue.

Our own Society recently completed a highly enjoyable Annual Meeting in Regina, held in conjunction with the Entomological Society of Saskatchewan. While the reports that were presented to the Governing Board by Officers, Trustees and Committees are printed in this issue of the Bulletin, the Actions of the Governing Board and Minutes of the Annual General Meeting will be available in the March 1984 issue.

H. J. Liu
Alberta Environmental Centre
Vegreville, Alberta

Mot de l'éditeur

Ce numéro du bulletin contient plusieurs articles qui traitent de nos relations, à titre collectif ou individuel, avec d'autres organismes professionnels. Il sera en particulier question du Conseil canadien de biologie dont nous assurons en partie le financement par nos cotisations, mais pour lequel notre intérêt oscille depuis plusieurs années. L'éditorial de M. Wiggins et le rapport du président, M. South, ont pour but de nous informer du rôle et des activités du conseil et de nous permettre de comprendre pourquoi notre société s'implique dans cet organisme-parapluie. On trouvera aussi un rapport de la Commission internationale de nomenclature zoologique, dont les travaux revêtent une grande importance pour tous les entomologistes. Le fonds qui s'occupe des finances de la commission mettra bientôt sur pied une campagne de financement pour assurer la poursuite des activités de l'organisme.

Notre société a tenu récemment sa réunion annuelle à Regina, conjointement avec l'Entomological Society of Saskatchewan. Les rapports présentés par les divers administrateurs, mandataires et comités au conseil d'administration lors de cette réunion apparaissent dans le présent numéro du bulletin. Par contre, le résumé des travaux du conseil d'administration et le procès-verbal de la réunion annuelle générale paraîtront dans le numéro de mars 1984.

H.J. Liu
Alberta Environmental Centre
Vegreville, Alberta

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