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ENTOMOLOGICAL SOCIETY OF CANADA

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# Bulletin

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VOLUME 5

NUMBER 1



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1973 ANNUAL MEETING  
REPLY FORMS  
PAGES  
16-17

# ENTOMOLOGICAL SOCIETY OF CANADA

## EXECUTIVE COMMITTEE

- President: D. K. McE. Kevan, Dept. of Entomology,  
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- Treasurer: E. C. Becker, 1320 Carling Ave.,  
Ottawa, K1Z 7K9
- Editor: D. P. Pielou, Dept. of Biology,  
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### CHANGE OF ADDRESS

The headquarters of the Entomological Society are now located at 1320 Carling Avenue, Ottawa, Ontario K1Z 7K9. All correspondence to the Treasurer and Managing Editor and all correspondence dealing with dues, missing and back issues of *The Canadian Entomologist* or the *Bulletin of The Entomological Society of Canada* and especially changes of address should be sent to the new address.

E. C. Becker  
Treasurer

### CONTRIBUTIONS

Contributions and correspondence should be sent to: D. C. Eidt, Editor, *Bulletin of the Entomological Society of Canada*, P. O. Box 4000, Fredericton, New Brunswick. Inquiries about subscriptions and back issues should be referred to the Treasurer, Entomological Society of Canada, 132 Carling Ave., Ottawa, Ontario, K1Z 7K9.

### DEADLINE

The deadline for the next issue, Vol. 5, No. 2 for June 1973 is 15 May.

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D. P. Pielou      Editor (Society Publications)  
D. C. Eidt        Assistant Editor (Bulletin)

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Cover Design: M. A. Sydor, bio-Graphic Unit

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Published by the  
Entomological Society of Canada  
1320 Carling Avenue, Ottawa

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*Editorial*

**PARTICIPATION NOT RESIGNATION**

Recently one of our members resigned. Nothing unusual, membership are often allowed to lapse. This time however, the resignation came in the form of an emphatic letter giving the reason for the resignation. He was the victim of a series of faux pas, like not receiving a programme for the 1972 annual meeting, having a manuscript for the *Can. Ent.* acknowledged very late, and being subjected to red tape over a request for a page charge waiver.

These sorts of insults hit lots of our members, probably not in volleys, but adequate to cause resignations. We hardly blame him.

We believe membership in the Entomological Society of Canada is a bargain. The Society does more for the average member than he can do for the Society. If it were not so, there would be no Society. All but a small part of the work of the Society is done by volunteers who fit it into the time left over from full-time occupations. It has to be left until last and often is not done satisfactorily (see next editorial). The solution to the problem is not resignation, but participation, even if only to make your opinions known, to make the Society serve its members more effectively. Now is a critical time for the Society, which is being called upon to make an increasingly active role in shaping national goals in science and technology.

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**GREMLINS**

The last issue of the *Bulletin* had almost as many typographical errors as the *Crocus*, Saskatchewan, Bugle or whatever W. O. Mitchell called it. It was more rushed than usual because of the timing of the annual meeting, but other than that, we make no excuses. The printer has offered to re-run the photograph of the 1972-73 Board of Directors, full-page, with the correct caption, at his expense. We apologize and promise to be more careful henceforth.

## LETTERS TO THE EDITOR

### FELLOWSHIPS

Sir:

At the recent meeting of the Board of Governors of the E.S.C. the proposed plan for electing "fellows" of the Society was discussed. The Board noted that although a majority of the mail ballots were in favor of the principle, there was a strong "anti-fellow" group among the members. It was agreed that further discussion of the principle and of the qualifications and method of elections of fellows should be held, using the **Bulletin** as a forum.

As members who oppose the principle of designating a group of fellows, we noted recently a parallel situation within the Ecological Society of America. In this Society, members are debating the issue of "professional ethics" and "certification" of ecologists. In this connection, E. S. Deevey (*Bull. Ecol. Soc. Amer.* 53: 5-6) notes that the proposal is (i) "divisive, and will destroy the society that tries it," and (ii) "in principle elitist, and arrogant in its implied exclusion of other professions." Bruce L. Welsh (*ibid.* 53(2):5-6) professes himself to be "deeply saddened that members . . . may waste their valuable energies debating (these issues)".

We believe that the "fellowship" proposal in the E.S.C. is similarly divisive and elitist in principle. We are also saddened by this debate and wish that the energies of our members could be directed to more important issues affecting the E.S.C. and broader areas of society rather than looking inward and concerning ourselves with internal recognition of a "superior" group of entomologists.

W. J. Turnock  
George H. Gerber  
G. K. Bracken  
G. E. Bucher  
H. G. Wylie

### BULLETIN

The **Bulletin** of the Entomological Society of Canada is the official organ of the Society. Most actions and notices affecting members are published in the **Bulletin**, e.g. notices of meetings, actions of committees, minutes, actions of the Board, notices of policy change, requests for opinion and participation. Book reviews, articles other than research papers, and Society notices are no longer published in the **Canadian Entomologist**, which is reserved for scientific papers.

## ORDINARY, AND PREFERRED

Sir:

Your two-column summary of the results of the "Fellowships" ballot was just what was needed. Perhaps it shows that there is no middle ground on which we can all meet in this matter.

When you recollect that we got safely through our Centennial celebrations without going on an emotional binge over our Imperial past, it makes you wonder what made our executive suddenly come up with such an Early Victorian proposal.

The fellow-countrymen of Lewis Carroll may enjoy making a word like "fellowship" mean whatever they want it to, but my preference is for the true definition that implies universal comradeship. If we are going to allow ourselves to be stratified, let us at least do it honestly, without debasing the meaning of a word that, Heaven knows, can be put to much better use in these stressful times.

Let us, in fact be honest North Americans, and borrow from the language of the stock market. I propose that we divide ourselves into "ordinary" and "preferred" members.

G. E. Shewell

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## COLD HARDINESS IN NORWAY

Sir:

Have just read the most recent edition of the **Bulletin**. I am presently on sabbatical leave in Norway, so it takes a little time for my mail to catch up with me. Please accept my congratulations for what is a most interesting edition of the **Bulletin**. I was most interested and inspired by Dr. Salt's address, since I am presently working with Dr. Lauritz Sømme on insect cold-hardiness.

I am presently on a year's sabbatical leave from the Biology Dept., University of Victoria, B.C. I spent the first six months, July - December 1972, working on intertidal insects at the Scottish Marine Biological Association, Dunstaffnage Marine Research Laboratory, Oban, Argyll, Scotland. During that time I attended the 17th International Congress of Zoology in Monaco (24-30 Sept. 1972). I am spending the second six months, January - July, 1973 at the Zoological Laboratory, University of Oslo, Norway, working with Dr. Sømme. Working specifically with bark beetles at the moment, *Scolytus ratzeburgi*, but hope to extend this to include other species later. On 18 February 1973, I will be participating in the meetings of the Norwegian Entomological Society by presenting two papers on my recent work.

Will be returning to Victoria around the end of July 1973.

I hope you will find some space in the **Bulletin** for this, since many of my entomological colleagues don't know where I am this year and are perhaps wondering about my delayed response to mail.

Richard A. Ring

# ENTOMOLOGICAL SOCIETY OF CANADA

## COMMITTEE CHAIRMEN AND REPRESENTATIVES

*Addresses are given only when inadequate in Dec. 1971 list, Bulletin 4(1)*

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Science Policy Committee Chairman:	Dr. W. F. Baldwin.
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Alternate:	Dr. D. R. Oliver.
Canadian Committee on Water Pollution, Representative:	Dr. A. L. Hamilton.
Canadian Council on Animal Care, Corresponding Member:	Dr. A. E. R. Downe.
C.S.A. Committee on Common Names for Pesticides:	Dr. L. O. A. Roadhouse.
E.S.O. - E.S.C. Committee on Exchanges:	Dr. J. F. McAlpine.

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## OFFICERS AND GOVERNING BOARD 1972-73

*Front row:* B. N. A. Hudson, Director-at-large; E. C. Becker, Treasurer; J. R. McLintock, President-Elect; D. K. McE. Kevan, President; P. S. Corbet, Past-President; D. M. Davies, Secretary; M. E. MacGillivray, Acadian.  
*Back row:* K. S. McKinlay, Saskatchewan; J. E. McFarlane, at large; C. R. Harris, at large; L. L. Pechuman, at large; P. S. Barker, representing V. Hildahl, Ontario; J. A. Downes, at large; W. J. Turnock, at large. *Inset:* W. Smirnov, Quebec.



*Officers and Governing Board — 1972-1973*





## ON TARGET

The anti-aircraft missile, which finds its target by using infrared sensors, is something of a modern wonder. However, parasitic wasps which find and lay their eggs on beetle larvae buried beneath the bark of trees have been doing this for thousands of years.

Richerson and Borden (Can. Ent. 104: 1877-1881) studied a parasitic wasp, *Coeloides brunneri*. The female of this wasp drills its ovipositor into trees to lay its eggs on beetle larvae burrowing invisibly beneath the bark. They showed that neither the sounds made by the burrowing larvae, nor odour, could account for the wasp's ability to find its host. What could be demonstrated was that the bark immediately above the burrowing larva was slightly warmer than at other points distant by the length of the female wasp's antenna. This temperature difference was quite small, between 0.5 and 1.0°C.

Confirmation that the female wasp was using heat to detect suitable oviposition sites was obtained by burying small heating elements beneath the bark. In every case the female drilled into the bark above the heating elements. Since the wasp's antennae did not actually touch the bark when hunting, the authors concluded that it was detecting infrared radiation from the hot spots above the burrowing larvae.

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## LESS PESTICIDE ON APPLES?

Commercial agriculture depends upon growing large numbers of one kind of plant on limited areas. This means that the farmer may be creating conditions which favour the build up of insect pests. Is it possible to restore some kind of balance in a monoculture so that natural forces, such as parasites or predators, will keep pest insects at a reasonable levels without excessive use of pesticides? MacLellan (Can. Ent. 104: 1397-1404) has studied this problem with the codling moth in Nova Scotian apple orchards. That's the worm you'd rather find in the apple you're eating than half of one.

Since the apple was introduced into Nova Scotia in 1633 it has spread throughout the Province and may be found growing wild in many areas. MacLellan found that wild apple trees and abandoned orchards had low levels of codling moth infestation with only small population fluctuations from year to year. By contrast, commercial orchards, particularly young ones, had big variations in codling moth numbers from year to year with large infestations in some years.

MacLellan studied the parasites and predators which attack the codling moth. Over a seven-year period parasitism was found to be three times higher in codling moth on wild trees. Predator populations were found to be very low where pesticides were used extensively. However, where integrated control was practiced, predator populations remained almost as high as those in abandoned orchards or those receiving no sprays.

The author stated in conclusion, "With today's emphasis on new and better selective controls including selective insecticides, sterile male techniques, growth regulators, pheromones and attractants, it should be possible to further complement native or introduced natural enemies in commercial orchards to reduce codling moth numbers to the levels found in natural fruit."

## NO SONG OF LOVE

Courtship presents most of us with problems at one time or another but Pickford and Gillott (Can. Ent. 104: 715-722) took a wider view than most. "How", they wondered, "does a grasshopper who can not sing attract a mate?"

In many groups of grasshoppers and crickets the attention of the female is drawn to the male, and vice versa, by auditory signals — they chirp. In some species the male chirps and the female responds, in others only the male is vocal. However, in some species both sexes are silent so that one wonders how they promote togetherness?

Pickford and Gillott studied a laboratory strain of one of the silent species, *Melanoplus sanguinipes*. When mature males and females are present in the same area and ready to mate, the males wave the antennae conspicuously and vibrate the hind legs. Surprisingly, the studies showed that this obvious behaviour was not necessary for normal mating. However, blinding the male by covering the eyes with an opaque paint caused all courtship behaviour to cease. It appeared that the males depended principally on sight to find a mate. Males could distinguish mature females from immature ones and mated females from virgins. In the latter instance the grasshopper is notably smarter than the human male! The authors felt that this fine discrimination might depend upon chemical stimuli but that additional experiments would be needed to prove it.

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### LETTER

Dear Sirs:

In early November, we will begin publishing a weekly subscription newsletter, ECO/LOG WEEK, which will attempt to provide an interpretive coverage of all aspects of the environmental conservation and pollution control scene in Canada. We will be interested in every aspect of environmental control: air, water, soil, noise, thermal, radioactive, and so on.

I am writing to ask you to ensure that I am on your mailing list to receive all press releases, announcements, news bulletins, annual reports, speeches, technical papers, newsletters, brochures and pamphlets, in the environmental control field.

Thank you for your co-operation. We will do our best to provide a balanced and accurate coverage of your activities in this field.

James Hilborn, Editor  
ECO/LOG WEEK  
Suite C, 6 Crescent Rd. Toronto, Ont.

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*Il faut bien que je supporte deux ou trois chenilles si je veux connaître les papillons. Il paraît que c'est tellement beaux. — Saint Exupéry*

## 1972 PHOTO SALON

At the 1972 Annual Meeting, the Photo Salon became a part of the National (U. S.) Insect Photographic Salon for 1972 (the 15th).

There were 180 entrants who submitted slides and 10 who submitted sequences. Over-all quality of the entries was extremely good, resulting in the acceptance of 315 slides out of the 714 submitted. Of the ten sequences submitted, five were accepted, the Award of Merit going to an entry from England. Three Canadians submitted two sequences each, and each received one acceptance, two of them with Honourable Mention. Thus Canadians have maintained their reputation in the field of sequences!

A new award was made available this year in the form of a gold medal, presented by the National Association for Photographic Arts (a Canadian Association) for the best slide in the show.

The silver medal given by the Photographic Society of America, in recognition of a well-run Salon in 1971, was awarded to the best example of insect camouflage or mimicry.

### AWARDS

**National Association for Photographic Arts Gold Medal Best Slide of Show and  
ESA Award of Excellence for Best Slide of Show by a Non-Member:**

Dr. Aubrey Crich, APSA, Grimsby, Ontario

*Male Water Bug with Eggs on Back # 7*

**ESA Award of Excellence for Best Slide by a Member of ESA, ESC or ESQ**

E. N. Woodburg (ESA), Wilmington, Delaware

*Red-Banded Hairstreak (Principio furnace)*

**P.S.A. Nature Division Silver Medal for Best Slide Depicting Camouflage or  
Mimicry**

E. N. Woodbury, Wilmington, Delaware

*Camouflage, Green Comma*

**ESA Award of Excellence, Sequences**

L. McLeod, Balsham, England

*Anthrax pithecius Fab. Parasitic on Synagris analis*

### HONORABLE MENTION

#### Slides

Charles Bartlett, Easthampton, Massachusetts

*Red Sphinx*

Glenn A. Baum, Sunnyvale, California

*Mesquite Weevils # 1*

Catherine Chain, Glendora, California

*Hairy Mygalomorphs*

Mary D. Creager, Decatur, Illinois

*Royal Walnut Moth # 7*

Amos D. De Hosse, APSA, Belleville, Michigan

*Swallowtail Larva*

John W. Evans, Fort Worth, Texas

*Robber Fly Cannibalism #1*

*Cone Nose Bug Feeding on Io Moth Larva*

*Robber Fly Mimics Bumble Bee*

- Karl A. Grube, Herndon, California  
*Sac Spider and Its Egg Sac # 3*
- Harold N. Hickey, New Orleans, Louisiana  
*Phidippus audax with Fly*  
*Many Ages (Wasp's Nest)*
- Robert R. Hill, AFIAP, Rochester, New York  
*Origaba larva*
- Bruce Hodge, Orange, N.S.W., Australia  
*Spitfires # 6*
- Isidore Jeklin, Toronto, Ontario  
*Common Fly*
- Howard L. Kessler, FPSA, Sacramento, California  
*Ant Tending Aphids*  
*Pause in the Fight (Mantids)*
- Laurie Kriz, Apache Junction, Arizona  
*Hadrurus arizonensis*
- Nelson H. Martin, Santa Barbara, California  
*Spittlebug Secreting Protective Froth*
- Vashti McCollum, Springdale, Arkansas  
*Skipper*
- Gladys W. McKinney, Houston, Texas  
*Twig Girdler Cutting Mimosa*
- David B. Mills, East Lansing, Michigan  
*Lace Bugs Adults and Nymphs # 3*
- Wiles F. Mitchell, Rochester, New York  
*Red-Banded Leafhopper*
- Bruce O'Cull, Momence, Illinois  
*You and Your Short Cuts!*
- Herbert B. Parsons, Ashland, Massachusetts  
*Spider and Victim*
- Leslie J. Richards, Invercargill, New Zealand  
*Cabbage Tree Moth (Epiphyryne veniculata)*
- Thomas M. Smith, Invercargill, New Zealand  
*Peripatus (Peripatoides novae zealandiae)*
- Robert V. Staats, EFIAP, Newport Beach, California  
*Hungry Tarantula Hawk*
- Audrey N. Tomera, Murphysboro, Illinois  
*Pond Crayfish*
- Gary Weber, Newcastle, N.S.W., Australia  
*Araneus Spider*
- Joe S. Weddle, McKittrick, California  
*Trapdoor Spider with Burrow*

#### Sequences

- W. Aubrey Crich, APSA, Grimsby, Ontario  
*Green Dragonfly from Larva to Dragonfly*
- Evan Gushul, Lethbridge, Alberta  
*Warble Grub Emerging*

## MOSQUITO CONTROL

A new CDA publication offers extensive information and control advice for **Planning an Anti-Mosquito Campaign**. A compact, 15-page brochure, it explains:

Why control campaigns are necessary. (Because Canada's extensive breeding grounds produce nearly 60 different kinds of mosquitoes; most must feed on blood in order to lay eggs, thus causing considerable discomfort to people and animals).

The mosquito life cycle.

The need for planning a full-fledged antimosquito campaign before warfare commences in the spring.

How to conduct a mosquito survey and recruit the efforts of several communities (mosquitoes pay no heed to fences or municipal boundaries).

The equipment necessary and available to fight mosquitoes.

The need to consult representatives of provincial departments of health or agriculture, to learn what insecticides are permitted in each area.

The brochure, publication 1485, is available from: The Information Division, Canada Department of Agriculture, Sir John Carling Building, Ottawa, Ont., K1A 0C7.

On peut aussi obtenir cette brochure en français. Demandez publication N° 1485 de la Division de l'information du ministre de l'Agriculture.

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## PESTICIDES REVIEW

As a major user of pesticides, agriculture should be responsible for research, information, and regulations to protect the environment. Accepting the responsibility, the Canada Committee on Agricultural Meteorology invited experts to assist in reviewing current scientific knowledge about airborne pesticides. Of interest to the CCAM were the relation of pesticides to: their potential sources; spray dissemination; microscale, mesoscale and synoptic-scale transport; analytic techniques; biological significance; monitoring by a national network.

Although not exhaustive, the review resulted in the delineation of certain areas on which to focus attention. These include: a need for comprehensive data on regions of pesticide pollution; a need for standard procedures for evaluating spray equipment and analyzing pesticides; a need for knowledge about the various fluxes by which pesticides leave and enter the wind field.

A series of position papers, that provided background information for the review, have been published and are available from: Agrometeorology Section, Plant Research Institute, Canada Department of Agriculture, Ottawa, Ont., K1A 0C6.

Copies of the photographs of the Governing Boards of 1971-1972 and 1972-1973 (8 x 10 glossy prints) are available to anybody interested. Order directly, at \$2.00 per print, from Ralph Emery A.R.P.S., Photographer, P. O. Box 1113, Pointe Claire, P. Q.

## DAVID EDGAR GRAY 1913 — 1972

On 21 September 1972, after a long bout with cancer, David E. Gray died at the age of 59. He had a long and distinguished career with the Canadian Forestry Service, Department of the Environment and antecedant organizations.

Dave was born 18 May 1913 at Woodlawn, Carleton Co., Ontario and received his early education in Ottawa area schools. He received the B.S.A. in entomology from the University of Toronto (Ontario Agricultural College) in 1936 and the M.Sc. in forestry and conservation from the University of Michigan in 1940. In 1938 he was awarded a Canadian Pulp and Paper Association Scholarship for post-graduate training in entomology.

His career began as a student assistant with The Department of Agriculture in the summers 1930 to 41. His first permanent appointment in 1941 was interrupted, as were his aspirations to attain the Ph.D., by war service, where he earned the rank of Flight Lieutenant in the R.C.A.F. After the war Dave became Assistant to the Chief or Director (as the titles changed) responsible for forest entomology and pathology. In 1966 he was commissioned to form an entomology unit in the Eastern Forest Products Laboratory at Ottawa.

He was involved in survey of pine shoot moth, nursery pine sawfly, European spruce sawfly, and other insects. He was associated with the Forest Insect Survey from its inception. For twenty years he was the key man in personnel and general administration in the Forest Biology Division, later the Forest Entomology and Pathology Branch. He conducted research on white pine weevil in the 1930's and recently on the control of wood borers and termites.

Dave was well known for his energy and enthusiasm and hardly anyone connected with forest entomology or pathology in Canada has not felt his influence.

He is survived by his wife Catharine, who lives at 2143 Dutton Cresc., Ottawa, and by three children.

D. C. Eidt

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### CONTRIBUTIONS TO THE JOHN SANDNESS FUND

The University of British Columbia (Department of Plant Science) has established this fund in memory of Dr. John Sandness who came to their department in July 1969 and died prematurely of diabetes on 27 September 1970.

During this short time he laid the foundations for a programme in applied entomology in that department, a programme which now involves three full-time faculty members. He had little time to establish a research programme, but soon proved himself to be an excellent teacher, establishing a fine rapport with his students.

Many of his students have contributed to this fund and it is hoped that other entomologists will wish to contribute, so that a meaningful scholarship or bursary can be established for students in applied entomology.

Please send contributions to: Professor V. C. Runeckles, Chairman  
Department of Plant Science  
University of British Columbia  
Vancouver 8, B.C.

## SCIENCE WRITING FOR THE PUBLIC

*Reprinted from the Newsletter of the Canadian Science Writers' Association 3(1) Jan.-Feb. 1973*

Consider for a minute the real big-time in specialist writing (whether for print or broadcast): sports writing. Why? Because the sports pages have readers. A lot of readers. And ranging from the professional to the mildly-interested wife who wants to talk to her husband.

Interest by the readers is reflected in editors' attitudes. Just consider who's assigned to which ministers when a federal election is called. Whoever's not busy in the office will get to cover the science minister when he's in town, for he's not half as important as the minister in charge of Sports Canada. Or consider a large, maybe international, convention for scientists. Almost any reporter will do. Express a strong interest in science and you're the one.

However, suppose you wanted to cover a Grey Cup or Stanley Cup game. The list of competent writers, columnists and editors lined up to review the water boy of the losing team is five or six deep. And these individuals aren't newcomers to the field; they represent editors and broadcasters who have been in the business up to 20 years. Often they've made it in the particular sport first.

Name two scientists in Canada who have achieved major awards for their work who are in the Canadian Science Writers' Association as professional writers.

Specialists? At least two newspapers in medium-sized cities in Canada go out and find a specialist in lawn bowling to cover the local tournaments for them. Name two newspapers in Canada who would use a specialist in chemistry to cover a chemistry convention.

On the other hand, however, name one scientist in Canada who respects the press enough to consider it as a possible career after he's become an expert in his field.

Name me one scientist who has the respect for the press that any professional sports coach has.

Coaches and players who make it in sports know what the news media can do — and how they do it. Or they soon learn. Not that they care about the press; most of them have a healthy disrespect for reporters. However, they know that the ones who really matter are the readers or listeners (Sure, maybe it's for money, but I haven't noticed scientists sneering at public grants lately). The public is all important to good sports people.

And they take the time and the trouble to communicate through that lousy intermediary, the reporter, so they can reach the public.

Right now, it appears to be up to the science writers to try to make science news. Its up to them to make a dry-as-dust topic presented in a boring, lecture-room manner interesting and intelligible to audiences that often have little or no knowledge of the subject. Scientists tend to claim, rather scornfully, that you shouldn't put it into English from science-ese.

"You have to write for the top 10 per cent," to quote a comment from the science writers' seminar.



It may be that scientists are too concerned with communicating with other scientists — with the top 10 per cent — through the public's press. Not many hockey players learn to play hockey through the sports pages.

And until scientists learn that reaching the public is important, that talking to people is important, science writing will remain small-time.

Glennis Zilm  
Medical Writer  
Canadian Press, Ottawa

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### 1973 GEORGE J. SPENCER MEMORIAL LECTURE

The 1973 Spencer Memorial Lecture will be held at the University of British Columbia on 28 March 1973 at 8:00 p.m. in Room 2000 of the Biological Sciences Building. The speaker will be Professor L. P. Brower of the Department of Biology, Amherst College. The title is "Experimental proof of the palatability spectrum in natural populations of the Monarch butterfly". You are invited to attend.

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### INSTRUCTIONAL KIT

The Entomological Society of America and Brigham Young University are collaborating in the preparation of instructional kits for an introductory course in entomology. The kit will include 27 or 28 cassette taped lectures prepared by demonstrated experts, charts, graphs, maps, diagrams, color transparencies and a manual. The tentative cost is U.S. \$300 to 400 per kit, to be mailed soon after 1 September 1973. Indications of intent to purchase are being received by Vernon J. Tipton, chairman, E.S.A. Committee on Education, Box 7402, University Station, Provo, Utah 84601.

The **Bulletin** has only the outline and list of author-narrators sent to all E.S.A. members. It is a commendable undertaking and sounds like it will be well worth the purchase price.

### B.C.C. REPORTS

Views on the policies expressed in B.C.C. reports would be welcomed by our B.C.C. delegates:

Anne Hudson and D. R. Oliver,  
Entomology Research Institute, K. W. Neatby Bldg.  
Carling Ave., K1A 0C6, Ottawa

Please send comments on reports no. 16, 17, and 18, featured in the past two issues of the **Bulletin** and in the current issue, as soon as possible.

ANNUAL MEETING

*Entomological Society of Canada*  
*Entomological Society of Alberta*

1-5 October 1973  
*Banff School of Fine Arts*  
*Banff, Alberta, Canada*



*Feature Symposium*  
(2 October)

**SYSTEMS APPROACH TO PEST MANAGEMENT**

This subject of current entomological importance will be broadly based so as to attract participation and interest in all facets of entomological activity and to unify the scientific and technological aspects of entomology.

*Discussion Groups*  
(2, 3, 4 October)

As an alternative to submitted papers, members are invited (see page 18 for details) to participate in discussion groups on timely and interesting topics and problems. Participants must complete and return the adjacent form to Dr. Haufe, not later than 15 June 1973.

*Special Interest Groups*  
(1, 5 October)

Members wishing to organize informal conferences on specialized topics are requested to indicate on the tear sheet not later than 15 June 1973.

*Submitted Papers*  
(2, 3, 4 October)

Contributors must complete and submit the adjacent form to Dr. Charnetski, not later than 6 July 1973.

*Annual Meetings*

The Annual General Meetings of both Societies will be held during the week.

1973  
ANNUAL MEETING



TEAR OUT  
REPLY FORMS

**SUBMITTED PAPER REPLY FORM**

(Deadline - 6 July 1973)

**RETURN TO:** Dr. W. A. Charnetski, Agriculture Canada  
Research Station, Lethbridge, Alberta T1J 4B1

*PLEASE TYPE*

Author's Name: .....

Title of Paper (not to exceed 15 words): .....

To be read by: .....

Institution and address: .....

.....

.....

.....

.....

Projection equipment required: 2 x 2 , 16 mm movie   
(Other sizes and glass mounts not acceptable).

**SPECIAL INTEREST GROUP REPLY FORM**

(Deadline - 15 June 1973)

**RETURN TO:** Dr. W. A. Charnetski, Agriculture Canada  
Research Station, Lethbridge, Alberta T1J 4B1

Participant's Name: .....

Participant's, Address: .....

.....

.....

Title of Group: .....

Proposed Moderator: .....

Anticipated Attendance: .....

## DISCUSSION GROUP REPLY FORM

(Deadline - 15 June 1973)

Explanation overleaf

RETURN TO: Dr. W. O. Haufe, Agriculture Canada  
Research Station, Lethbridge, Alberta T1J 4B1

Participant's Name: .....

Participant's Address: .....

.....

TOPIC	Recommended Participant
1) Mountain fauna	.....
2) Biological availability of insecticide residues	.....
3) Insect pests of oil seeds	.....
4) Prediction of insect outbreaks	.....
5) Insect attractants and hormone analogues	.....
6) Insect sampling	.....
7) Aquatic fauna as indicators of environmental quality	.....
8) Insect vectors of disease (behavior, control)	.....
9) Economic insects - Cost-benefit assessment	.....
10) Place of systems analysis in pest management	.....
11) Host-parasite reactions	.....
12) Biometeorology	.....
13) Other (state subject)	.....

First choice of topic No. ....

Second choice of topic No. ....

## DEVELOPMENT OF DISCUSSION GROUPS

(Conference program - Banff)

Many members of ESC have expressed some dissatisfaction with the routine scientific program based on reading of prepared papers. The same concern is being encountered in some other societies and especially in congress proceedings. This has led the Committee on Scientific Program to consider the possible development of alternative methods of conference communication in the form of discussion groups on timely and interesting topics and problems. The Committee has decided to explore the interest of the membership in this type of activity and to develop a limited part of the program along these lines if there is general support within the Society.

The objective would be complete involvement of participants through open exchange on selected subjects with the exclusion of prepared positions and papers. A summary of the state of the art, current developments, and future prospects is a useful record that might be developed as a result of consensus in such group exchanges on selection subjects. It might conceivably be considered for later publication as a report of the conference if found to be of sufficient interest and use in the scientific community. Within the next few weeks the Committee will be evaluating the feedback on this proposal. If response is encouraging and facilities are available, an attempt will be made to organize one or more groups as a feature of the program on a trial basis. This proposal should not be confused with the call for submitted papers and should not influence intentions to submit papers for regular sessions of the conference.

Please record your interest promptly by completing the reverse side of this tear sheet. Indicate **two** topics ranked according to your interest and designate **one** additional topic only if it is considered to have equal or greater current importance in entomology. The Committee is also interested in workers that you recognize as prime candidates for participation in group discussions (list only one for each of your choices of topics).

The Committee must have prompt returns for an early decision. Moderators or chairmen will be designated to maintain contact among participants showing sufficient interest in a subject or problem, and to develop and conduct the group discussion as a scheduled session in the program.

Return completed tear sheets by mail (preferably not later than 31 March) to W. O. Haufe, Agriculture Canada Research Station, Lethbridge, Alberta. Participants in discussions on selected subjects (if development is feasible) will be contacted by mail before 15 June with further details on sessions and procedures.

## CURRENT ACTIVITIES OF B.C.C.

**BCC Fall Meeting, November 1972.** The theme of the meeting was: "Who is doing what about matters concerning the biosphere and biological research?" A number of prominent biologists and members of government agencies and departments attended the meetings as guests. They briefed the Council on the recent past events (the Stockholm Conference, Dai-Dong, SCITEC's recent meeting) and future plans (the Canadian Environmental Advisory Council, CCMAB, Science Council of Canada, DOE).

Dr. David Munro, Director-General, Intergovernmental Affairs (DOE) gave an interesting account of the Stockholm conference and the Stockholm Action Plan. He explained that the Stockholm conference was primarily a political exercise, which is clearly necessary before any large scale international exercise can be undertaken. However, in spite of its political nature, there was considerable biological input. A declaration of 26 principles to guide decision-making relating to the preservation of the environment, as well as to national development, may well become the basis of international law concerning the environment. A total of 109 recommendations – the Stockholm Action Plan – are under consideration by the U.N. It is hoped that a U.N. Council for Environmental Affairs, with a permanent Secretariat and \$100 million for funding, will be set up. The plan will follow up matters of education, human settlements (there will be a conference in Vancouver in 1975 on this subject), pollution and pollution control, national resource management (with particular emphasis on the cleaning up of rivers), and the maintenance of environmental quality (current action is evident with regard to ocean dumping).

**Canadian Committee on Man and the Biosphere.** MAB is a UNESCO program for international research on the rational use and conservation of the resources of the biosphere. A Canadian Committee has been formed under the Chairmanship of Dr. Peter Larkin, Department of Zoology, University of British Columbia. The Committee will have a membership of about twenty, broadly covering biology, medicine, technology, sociology and earth sciences. The BCC has provided the Committee with names of bioscientists as candidates for membership on CCMAB. Dr. Roy L. Taylor (BCC Vice-President) has been appointed a Corresponding Member of CCMAB, and will be responsible for receiving information from the Committee as well as transmitting BBC input to the Committee.

**Comité consultatif canadien de l'Environnement.** L'honorable Jack Davis, ministre de l'Environnement, a dévoilé la composition du Comité consultatif canadien de l'Environnement, qui le conseillera dans les domaines suivants: l'état de l'environnement et les dangers qu'il court, les priorités d'une action fédérale-provinciale, l'efficacité des efforts d'Environnement Canada pour préserver ou améliorer la qualité de l'environnement, et d'autres questions qui lui seront soumises au fur des besoins.

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### FROM THE CANADIAN ENTOMOLOGIST 100 YEARS AGO

A complaint has once or twice reached us lately to the effect that our publication was gradually becoming too technical . . . . We must confess that the complaint is not unfounded, and that we have almost unconsciously drifted somewhat away from the design of the periodical. (5:1)



## INSECTS IN THE ART AND MYTHS OF THE NORTHWEST COAST INDIANS

The ancestry of the Northwest Coast Indian is largely based on mythology; a mythology in which animals figure prominently. A spirit or supernatural being, frequently in animal form, would appear to, or be killed by some ancestor, or might even kidnap an ancestor who had violated taboos. In some instances the supernatural being is actually considered to be the original ancestor. This supernatural experience was then represented symbolically in the form of a crest or heraldic emblem, which was inherited by the descendants of the ancestor to demonstrate their lineage (Barbeau 1929, 1951; Drucker 1963). Consequently the people felt a very close bond with the mythological animals and used them extensively in their art.

Animals are found on their totem poles and in other characteristic carvings and designs with which they decorated almost everything. However, insects are represented infrequently. For example, in his book on the totem poles of the Gitksan Indians, Barbeau (1929) lists 109 poles with 525 figures or crests, of which only 15 are insects. Other animals occur 300 times, the most frequent being the bear, frog, wolf, eagle, thunderbird and raven.

I first came across insects in the art and myths of these people whilst trying to identify a figure on a Gitksan totem pole at Kitwancool, British Columbia. The figure turned out to be Large-nosed-person, also known as Large-belly (Barbeau 1929), with whom is associated the following myth:

One summer a young girl broke her seclusion taboos and went out to play with her brothers. That night a heavy snow blanketed the village, nearly covering their house, and when the young people looked out next morning they found themselves in a strange world. A monstrous being, Large-belly, appeared and called them out of the house one by one, whereupon he slit them open with his long, sharp nose and hung them in the rafters of his house to smoke and dry like split salmon. Eventually one of the boys managed to slay the monster and then fled with his sister and remaining brothers. However, a female monster of the same kind appeared and pursued them. Trying to escape they hid in a tree at the edge of a lake, but the monster saw their reflections in the water and dived in to capture them. Although it was summer the water was icy cold and the monster soon froze, enabling the fugitives to kill her. Before she died, however, she declared "The people will always suffer from my nose." From her remains were born the mosquitoes and other pests (Barbeau 1929, 1951).

According to Barbeau this myth accounts for the origin of the dragonfly crest adopted in the family of the survivors. However, elsewhere he refers to the dragonfly, mosquito and horse fly synonymously. This may be the result of the myth being common to a number of families and the consequent variations given by the different informants. It would seem that the mosquito would be more appropriate to the content of the myth.

The origin of the mosquito is the subject of other myths and amongst the Tlingits of Alaska is again closely associated with a cannibal being:

Long ago near Klukwan there dwelt a giant cannibal, Goo-teekhl, who was said to be sixteen feet tall and more powerful than a grizzly bear. He terrorized the district, gobbling up the winter stores of salmon from the drying racks, so that the people were in danger of starving. Warriors were sent against him but he killed and ate them, their arrows and spears proving useless against his thick hide. He then fell upon the people, devouring them, and soon the tribe was on the verge of extinction.

The survivors held council and the task of ridding the people of this scourge fell to the Ganaxadi clan who dwelt in the Frog House. They searched the forest for Goo-teekhl and eventually came upon a huge house which they knew to be his because of the red smoke belching from the smoke hole. When it was dark they dug a deep pit of the type used to trap grizzly bears. At the bottom of the pit they strung a net of strong bear sinew then covered over the pit with branches and grass. At daylight one of the people appeared in front of the house. Goo-teekhl, seeing him, chased him, expecting an easy breakfast. The Indian skipped lightly over the hidden trap, but the cannibal crashed into the pit and was enmeshed in the net. The Indians heaped branches on top of the helpless cannibal and set them on fire. Realizing what they were doing Goo-teekhl cried out that they were foolish men, it was not in their power to destroy him. Even though they burnt him to ashes he would go on eating their people for all time. They kept the fire burning fiercely for four days and nights so that the cannibal could not carry out his threat. When the fire had died down they stirred the ashes with long poles just to make sure that nothing was left of their enemy. As the sparks flew up out of the pit they changed into myriads of mosquitoes which immediately started to bite the people and draw their blood. Goo-teekhl had made good his threat! In an attempt to appease the cannibal they carved a large wooden image of him and since that day the people of the Frog House at Klukwan have fed the image hoping that Goo-teekhl will relent and the mosquitoes will stop biting (Barbeau 1951; Keithahn 1963).

This story is most vividly told in a model potlatch pole illustrated in Keithahn's book. Here Goo-teekhl is shown holding half a frog, representing the depleted peoples of the Frog House whom he holds in his power, and below him is a mosquito biting another frog.

The Kwakiutl version of the origin of the mosquitoes is basically very similar and, in brief, is as follows:

Chief Nun-nu-kai-wie had four sons who wished to go hunting. He told them to be very careful, for over the mountains, in the Valley of Smokes, there lived the terrible cannibal giant Bakbakwalanooksiwae. Before they set out the sons were given four magic articles — a pebble, a comb, a vial of oil, and a piece of wool — which were to be thrown to the ground one by one if the cannibal should chase them.

The young hunters set out and eventually came to the Valley of Smokes. There they saw houses from which issued smoke of different colours; white smoke indicated the home of the mountain sheep; black, that of the black bear; brown, of the grizzly bear; and blood red smoke, the house of the cannibal. Disregarding their father's advice they entered the village and went to the house with the blood red smoke. There they found a fat ugly woman and a young child.

One of the hunters had scratched his leg and it was bleeding. The cannibal child spotted this and though his mother tried to restrain him he started to lick the blood. The hunters then realised they were in the company of cannibals and must escape. This they accomplished by shooting arrows through the doorway and then running outside on the pretext of retrieving them. When they did not return the woman shouted to her husband, "Bakbakwalanooksiwae, our dinner has escaped." The giant cannibal set off in pursuit of the hunters. Hearing him close behind they threw down the magic pebble, which turned into a mountain. This delayed the cannibal for a little time, but he soon caught up. The hunters then threw down the comb which turned into a thicket of thorns, and again the giant was slowed down. Then they threw down the oil which turned

into a lake and finally the wool which produced a thick fog. With the help of these magic articles the hunters reached the safety of their home and just managed to bar the door as the enraged cannibal flung himself at it.

Chief Nun-nu-kai-wie called out to Bakbakwalanooksiwae to go away in peace and return in four days when he promised he should have his sons to eat. As soon as the cannibal had gone Nun-nu-kai-wie started to make his preparations. He ordered his sons to dig a deep pit within the house over which they supported a large wooden settee. The chief then killed some dogs and pulled out their entrails, then told his sons to lie on the floor and pretend to be dead with their intestines torn out. Finally he heaped rocks on the blazing fire.

When the cannibals arrived they saw the young hunters seemingly dead and disembowelled, but before they were permitted to start the feast they were shown to the seat of honour, the settee beside the fire. The chief then entertained his unwelcome guests with long stories, and as planned, the drone of his voice and the heat of the fire soon put them to sleep. The four sons sprang from the floor, pulled the supports from under the settee tumbling the cannibals into the pit. The red hot stones and boiling water were then thrown into the pit. The bodies of the cannibals were cremated, and Nun-nu-kai-wie, gathering up the ashes, scattered them in the wind saying: "Bakbakwalanooksiwae, you shall pursue men for all time and in all places." The ashes turned into mosquitoes (Barbeau 1951).

Barbeau (1951) also cites a version of the mosquito myth given by Swanton (1905-09), which is a combination of the "cannibal frozen in the lake" (Large-nosed-person) and the "cannibal cremated" themes. In this version the cannibal seeing the reflection of his Indian fugitives in the lake dives in to capture them, but the lake freezes over and he is held fast in the ice. The Indians then build a fire over his head and the flying ashes turn into mosquitoes.

Not only is the mosquito's creation accounted for in the several versions of the myth given in Barbeau (1951), but also that of the black fly, sand fly, horse fly, and biting and stinging insects in general.

Another myth with a major entomological theme is that of the woodworm, also known as the scrubworm, grubworm or caterpillar.

In this myth a young girl, who was in seclusion prior to her reaching maturity, became so lonely that she tried to make a pet out of a woodworm which had been brought in with the firewood. But the woodworm would not eat and finally, in desperation, she gave it her breast. In time the woodworm grew to an enormous size and the girl had trouble in keeping it concealed. At night when everybody was asleep it would burrow under the village popping up at intervals to gobble up the winter stores of dried salmon, berries and oolachen oil.

For a long time the people did not know who was stealing their food. Then one day the girl's mother, wishing to see how her daughter occupied herself, visited her quarters and found her singing a lullaby to the woodworm. Horrified, the mother called the chief who took one look and sent for the girl's uncle. By means of a ruse they got the girl away long enough to take a good look at the monster. They decided that it must be killed in order to save the remainder of their food and also because it might become dangerous. The problem was how to do it without the girl's knowledge. In secret the men made spears. Then on an appointed day the girl's aunt sent for her to come and look at a marten-skin cloak which was being made for her to wear in the ceremony that would terminate her seclusion. As soon as the girl was out of the way the men killed the monster by thrusting their spears down its burrow. When the

girl returned and discovered their deed she could not be consoled and sang the woodworm lullaby day after day, night after night until she died.

Because of this event the family of the girl took the woodworm as its crest and migrated north to settle at Klukwan in Alaska. The Woodworm house post from the Whale House is apparently still preserved at Klukwan and shows the girl holding a woodworm to her breast while two others form her head dress. Below the girl the mosquito is shown biting the frog, recalling the cannibal giant myth. Fine photographs of this post along with other woodworm poles and accounts of the myth can be found in Barbeau (1951, 1953), Keithahn (1963), and Feder (1965).



Fig. 1. Kwakiutl mask carved by Oscar Matilpi, 1972. Cedar wood, cedar bark and twine; red, black and yellow. Height: 25 cm.; length of singer: 15 cm. Owned by the author.

The Gitksan version of this myth, collected by Barbeau (1929), accounts for the origin of the Woodpecker or Caterpillar crest and is in part as follows:

A girl secretly adopted a young woodpecker as a pet and kept it hidden in a pit under the house. She kept feeding it and feeding it until it eventually developed into a huge caterpillar-like monster whose abode was a tunnel underground. The girl's parents, discovering the monster, killed it and took it as a family crest.

Of particular interest is Barbeau's footnote to this myth, in which he says that some of his informants described the caterpillar "as a grub, of the type that burrow tunnels in trees. Kweenu said, "This woman gave birth to little grubs, worms, as one finds in tree trunks. One hears them burrowing their tunnels."

Barbeau (1929) also relates another myth collected from the Gitksan which tells of a monstrous ghost-like moth:

During a terrible famine and drought many of the people died. Although very weak, having lived for a long time on nothing but fern roots, decayed rose berries and salmon bones, the survivors managed to build snares in the Spring and catch two mountain goats. On the bodies of the goats they saw a monstrous ghost-like moth feeding greedily. The people said, "It must be the ghost of one our dead relatives partaking of food." They killed the moth and thereafter used it as a crest.

A very large and important element in the artistic traditions of the Northwest Coast Indians is to be found in the carved wooden masks used in the ceremonials of their various dancing societies. Again animals in their natural, or grotesque and monstrous forms, predominate, but insects are infrequent. Audrey Hawthorn (1967), whose book features the art of the Kwakiutl, illustrates some 184 animal masks, including 70 bird monsters, 50 quadrupeds (mainly bear and wolf) and 29 birds. Only 12 insect masks, one mosquito and eleven bumblebees, are shown. Nine of the bumblebee masks, one large one and eight smaller ones, form a complete set owned by one family; the small masks being worn by the children.

The dances were intensely dramatic (Drucker 1963; McFeat 1966) and, as pointed out by Drucker, the Kwakiutl, being no mean dramatists, heightened the intensity with interludes of quiet dances or periods of clowning and buffoonery. Bees, wasps and the mosquito (Fig. 1), known appropriately enough as *Scratcher*, were amongst those characters that were intended to inject the comic interludes. These insects would dance amongst the potlatch guests "stinging" them with the sharp pointed sticks in their mouths. Those who thus "suffered" were rewarded for their "pains" with special gifts during the potlatch (Hawthorn 1967).

In one of the major dance cycles the principal dancer is possessed by the spirit of the cannibal giant *Bakbakwalanooksiwae* who, you will recall, was killed and burnt by *Nun-nu-kai-wie*. The mosquitoes, gnats and midges are also said to represent the flying sparks of the cannibal's pyre (Hawthorn 1967).

Hawthorn (1967) describes the dances of the insects as mimetic, simulating flight and hovering, and mentions that the dancers wore cotton cloth over their heads. She also refers to a photograph by Curtis (1915) of a wasp where the dancer was dressed in an over-all costume covered with short feathers.

An extremely fine old mask, claimed by the collector to be a mosquito, is illustrated in Siebert and Forman (1969). This mask was collected by the Russian explorer and zoologist *Voznesensky* between 1839 and 1845. It has a long pointed snout or proboscis with, interestingly enough, teeth. The teeth, and also the eyes, are of inlaid *haliotis* shell. Feathers and walrus whiskers are also used for decoration, but the most striking feature of this mask is the painted leather wings which are delicately fringed with eagle down.

The woodworm theme is also represented in the wooden masks. *Barbeau* (1953) and *Feder* (1965) show a human mask whose eyebrows take the form of two neatly carved woodworms. Presumably this mask represents the face of the girl who adopted the woodworm as a pet.

As well as carving in the usual medium of wood the Haida of the Queen Charlotte Islands are also famous for their work in argillite, a dark slate found only on their islands. Sometime around the beginning of the 19th century the Haida were in contact with the New England whalers that sailed the North Pacific. Here they saw the white sailors spending their leisure time doing scrimshaw, carving and engraving whales' teeth and walrus tusks. Quick





to embrace the new art, the Haida soon developed their own unique form, carving in argillite. A purely commercial production of small boxes, pipes, plates, figurines and miniature totem poles followed, these items being sold as curios to white explorers, traders and sailors, and today to the tourist (Barbeau 1953). Nevertheless argillite scrimshaw still retains the familiar figures illustrating the traditional myths.

A number of these argillite carvings are shown in Inverarity (1971), one being an extremely fine plate engraved with the design of a dragonfly. Other insects represented in carvings shown in Barbeau (1953), are the mosquito, on a small argillite panel with several other animals; the woodworm, on several miniature argillite poles; and the butterfly, shown in association with the raven, on a miniature pole and another small carving. The butterfly, according to mythology, was the spokesman or messenger for the raven who created the world. There are many myths telling us how the raven created the sun, the moon, and the stars, but apart from brief mention as the raven's companion the butterfly does not appear to play a prominent role. However, part of a myth in which the butterfly is featured is given in Barbeau (1953):

The raven and the butterfly came to a large village, where the people offered the raven food. But he was too proud to speak to the people directly and sent the butterfly to act as his spokesman. By deceit the butterfly managed to get all the food for himself, leaving only the burnt skins of the dried salmon for the raven. Some time later they came to a chasm. The raven persuaded the butterfly to cross on a kelp and when he was part way across the raven turned the kelp over. The butterfly fell into the chasm and was drowned, and the raven ate from his stomach the food he had obtained by trickery.

One is left to wonder how the proud raven fared after this.

I have found few other examples of the insect in my rather brief bibliographical search. One which I have come across several times is the woodworm dish shown in old photographs of the interior of the Whale House at Klukwan. This enormous ceremonial food trough is described as being fourteen feet long, carved many years ago in the form of a giant woodworm, with a long segmented body, human feet, and a human face with round, fat cheeks (Barbeau 1951; Keithahn 1963; Feder 1965). Another interesting and rather unusual example is shown in Barbeau (1953). This is a tiny pendant, possibly an amulet, of greenish stone carved in the shape of a scrubworm with a segmented body.

Finally, I have in my possession a silk-screen print of the dragonfly design (Fig. 2) by the Haida artist Bob Davidson, an example of the use of modern techniques.

Undoubtedly many more exist, Keithahn (1963), for example, says that the dragonfly was a popular design with the Tsimshian, and it would indeed be interesting to continue this search amongst the many fine museum collections.

Ian Outram

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*"You scientists are probably accustomed to the way in which people in public office are always requiring you to produce what they call practical results and expect you to justify your studies by proving that those studies help human beings to become fatter, lazier, less troubled and less frightened of extinction. . . . May I assure you that I still have a veneration for the scientist as one who is opening new windows on our understanding of existence."*

His Excellency the Governor-General of Australia, the Right Honourable Sir Paul Hasluck, to the 14th International Congress of Entomology.



## REVIEW

**National Engineering, Scientific and Technological Societies of Canada.** Science Council of Canada: Special Study No. 25. 127 pp. \$2.50. Available from Information Canada, Ottawa and most booksellers in Canada.

This study was commissioned by the Science Council of Canada: to obtain an inventory of the national scientific and technical societies, their objectives, procedures, and relationships with each other and with society at large; and to suggest means by which the societies might respond more quickly to matters of public concern and, in general, serve Canada better.

It is a well written report leavened by flashes of wit making it easy, often pleasant, to read. The essence of the message to the community of scientists, engineers, and technologists is this: The original objectives of our societies rarely envisioned the role that science now plays in society and made no provision for involvement in public problems. Times have changed, the role of the societies must be enlarged beyond the traditional one.

The background material was assembled by Dr. A. S. West of Queen's University and from it he, and the management committee of SCITEC, derive their separate impressions and conclusions. Altogether 121 national societies were asked for data, 82 responded at least in part, and over 100 interviews were held from coast to coast with members of 63 societies. Six group meetings were arranged as well as a program on the general subject during the 1972 annual meeting of SCITEC.

The inventory part of the report covers such matters as the history, kinds of societies, reasons societies have formed, the organizations, operations, and activities of the societies and the challenges they face. The chapter on problems discusses the many aspects of communications difficulties in Canada, as well as the operational and involvement problems; it will be read with profit by officers, past, present and future, of national technical organizations and, in fact, of any national organization.

The abiding concern in the report, and rightly so, is to mobilize the right mix of highly qualified people to attack matters of public concern. The life style of the man on the street is being affected by matters that are (hopefully) understood by the educated few who, to date, have shown no desire to explain what is going on and what the issues are. Government must make decisions in such areas and cannot reach effectively those who can clarify the issues.

The suggested solutions to these problems seem reasonable. If the major recommendations in the report were fully realized, the scientists, engineers, and technologists (SET) of Canada would have a House of SET in Ottawa operated by SCITEC, providing the member societies with pooled services, offices as necessary, a means of communication with fellow societies and with society at large. It would provide a focus for SET in Canada, catalysing and assisting in the broad aspects of social activities, providing government with considered multidisciplinary responses to questions of the day supplied by the memberships of suitable societies in time for the responses to be useful.

It is up to the community of scientists, engineers, and technologists of Canada to determine how much of this pleasant picture will become anything more than a dream.

F. J. L. Miller

Contributed by S.C.C.

## REVIEW

**Natural Resource Policy Issues in Canada.** Science Council of Canada: Report No. 19.

Some recommendations of interest to E.S.C. members are:

Federal and provincial agencies and the professional societies should encourage universities to broaden their undergraduate programs in the primary resource fields.

The search for more realistic measures of the environmental costs of resource exploitation and of the use and benefits of conservation in Canada should be intensified, as a matter of urgency.

Operations and planning for resource exploitation, transportation corridors and centres of population in the North should not proceed ahead of the development of Man's understanding of the North.

The Ministry of State for Science and Technology should press for the removal of the impediments to increasing extramural funding of research and development by all departments and agencies of the Federal Government.

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## BOOK REVIEWS

**Crop Loss Assessment Methods.** FAO Manual on the evaluation and prevention of losses by pests, diseases and weeds. Commonwealth Agricultural Bureaux, Farnham, Royal, Slough SL2 3BN, England. Price: \$12.00.

Crop losses caused by pests and diseases have affected man's health and his society for many centuries. In many countries, crop losses have been so great and so frequent that they have created famine conditions and sometimes contributed to great economic and sociological perturbations. Appraisal of crop losses should be more than just pure theoretical or hypothetical evaluation, and remains basic to the solution of several pest and disease problems. The determination of real economic crop losses are fundamental for the orientation and assessment of many research programmes. The lack of current crop loss information was recognized many years ago by many countries interested in agriculture. The need for an experimental basis for crop loss appraisal was evident and emphasized in 1967, when FAO (Rome) convened a symposium on "Crop Losses". It recommended that a manual of methods of crop loss estimation be prepared for the assessment of losses caused by insects, diseases, nematodes and weeds on crops of major importance, namely wheat, barley, rice, maize, potato and cotton; however, where good specific methods on other crops were submitted, these were also included.

The editor is Luigi Chiarappa, plant pathologist at the Plant Protection Service of the FAO, Rome. To obtain a worldwide coverage of crop loss documentation, the assistance of correspondents from many countries or language areas was sought. Canada was one of those countries. Helping were 38 correspondents in entomology, 39 in plant pathology, 18 in nematology and 12 in malherbology (weed science). To serve plant protection workers particularly, it was decided at the beginning that the manual should be compiled and presented in general terms only, outlining principles on which the planning and performance of field experiments and surveys could be based.

As expressed by Mr. Chiarappa, "it is anticipated that the first edition of this Manual will further stimulate the interest of individual scientists on the development of crop loss methodology so that the results of their research will be promptly submitted to FAO or its various correspondents in different geographical areas for a continuous source of fresh and useful information". This is why this publication is presented in such a form that additions or annual supplements can readily be added at intervals. A Manual of this kind cannot be considered as a final work.

It consists of an introduction (section 1) and three main sections: section 2 giving general information on field experiments and survey techniques; section 3, which forms the bulk of the manual, providing details of apparatus and methods; and section 4 containing miscellaneous information, such as conversion tables, plant growth stage diagrams, etc. The manual is to be published in English, French and Spanish, the official languages of FAO.

The committee is now in the process of preparing the second issue of the Manual. Contributions are needed on specific methods on other insects of the major crops covered already and insects on crops other than the six covered in the first issue. Additional information on techniques and apparatus used for assessment of pest populations, general assessment methods and plant growth stages of the various crops should complete the first manual. Information pertaining to insects of any crop is particularly sought on: field symptoms, effects on crops, procedures for sampling insect populations, procedures for estimating losses, and limitation and prevention of damage.

This Manual is one of the few examples of international cooperation and achievement in the world of plant protection. An invitation is at the same time addressed to all plant protection researchers and extension workers in all parts of the world to provide pertinent information by contacting the correspondents in their areas, or FAO directly.

M. Hudon

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## FORTHCOMING CONFERENCES

Second International Conference on Comparative Virology, 27-29 August 1973, Mt. Gabriel, Quebec.

First International Congress of Ecology, 8-14 September 1974, The Hague, The Netherlands. Write c/o Royal Netherlands Academy of Sciences and Letters, Kloveniersburgwal 29, Amsterdam.

International Seminar on Mosquito Control, 8-10 May 1973, University of Quebec at Trois-Rivières, P. Q. Write Antoine Aubin or Jean-Pierre Bourassa, Université du Québec à Trois-Rivières, C. P. 500, Trois-Rivières, P. Q.

First International Congress of Systematic Evolutionary Biology, Boulder, Colorado, 4-11 August 1973.

## BOOK REVIEW

**Die Tagfalter Europas und Nordwest Afrikas, ein Taschenbuch für Biologen und Naturfreunde.** by Lionel G. Higgins and Norman D. Riley, translated into German and revised by Walter Forster. Coloured illustrations by Brian Hargreaves. Verlag Paul Parey, Hamburg and Berlin. pp. 1-377, col. pl. 1-£0, 385 text-figs. 1971. Price: DM 34.

The fine and comprehensive handbook published in 1970 under the title "A Field Guide to the Butterflies of Britain and Europe" has been translated into German in this edition by Dr. Walter Forster, Director of the Bavarian State Zoological Collection in Munich. Dr. Forster is himself the senior author of a major work on European Lepidoptera and is an authority on butterflies in his own right. He has used his knowledge to good effect both to introduce the latest developments in the still rapidly advancing field of European butterfly classification and also to shift the emphasis from the primarily British one of the original English text to one more in accord with general European interests. The distributional maps have been dispersed through the text, near the accounts of the species to which they refer. The chapter on collecting has been replaced by a short section recommending that, in general, collections of European butterflies should **not** be made except for serious scientific objectives, but that photography of living insects provides possibilities for at least as satisfying a hobby as the collecting of dead specimens. The coloured plates have fully retained the fine quality of those of the English edition, and the book is produced in a similar compact and convenient format. The translation does justice in every respect to the original edition. The traveller in continental Europe may well prefer this edition if he has a good reading knowledge of German. Entomological libraries will wish to buy it in addition to the English original because of the supplementary information it contains.

Eugene Munroe

### NOTICE OF MEETING

The 72nd ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA Thursday to Friday 29 to 30 March 1973 will follow the Spencer Memorial Lecture at UBC on the evening of Wednesday March 28. Paper reading sessions will be held in the Conference Room of the CDA Research Station, 6660 N.W. Marine Drive, Vancouver 8, B.C. This notice is also a call for papers. Titles should have been sent to W.T. Cram at the above address by 1 March 1973. The length of the meeting will be determined by the number of titles submitted. There will be a banquet at the U.B.C. Faculty Club the evening of Thursday 29 March. The Directors will meet at 1300 on Wednesday 28 March at the Research Station.

## EMPLOYMENT

The Entomological Society of Canada maintains a list of employment opportunities in Canada for members, and has an employment office at annual meetings of the Society. Positions wanted and available are published in the *Bulletin*, for details see *Bulletin* 4(4):114.

### POSITIONS WANTED

Ph.D. with background in medical entomology and parasitology seeks position as an entomologist. University affiliation desired. Ref. No. 27-1-73.

Please direct all inquiries and correspondence to: S. R. Loschiavo, Chairman, Employment Committee, Entomological Society of Canada, 25 Dafoe Rd., Winnipeg, Manitoba. R3T 2M9

Do not direct inquiries to the *Bulletin*

### POSITIONS AVAILABLE

Le Département de biologie, Université Laval, annonce la mise au concours d'un poste destiné à un zoologiste qualifié pour enseigner la limnologie et, si possible, l'aménagement de la faune des eaux douces. Les recherches du candidat doivent se situer dans l'un ou l'autre des domaines de l'écologie des eaux douces (production, biologie des populations, biologie des communautés, éco-physiologie, éco-éthologie, contrôle de la pollution, etc.).

Le Département de biologie compte 20 professeurs travaillant dans les domaines suivants: biologie cellulaire, écologie animale terrestre, écologie marine, entomologie et physiologie générale.

Les demandes de renseignements et les candidatures doivent être adressées à: Dr Lucien Huot, directeur, Département de biologie, Faculté des Sciences, Université Laval, Québec 10, P.Q., Canada.

Applications for a position in limnology in the Department of Biology, Laval University, are invited from zoologists qualified to teach limnology and, if possible, management of fresh-water fauna. The research interests of the candidate should be in any field of fresh-water ecology (e.g., production, population biology, environmental physiology, behavioral ecology, pollution control, etc.).

The appointee will be required to teach in French. However, candidates who do not master French may apply, with the understanding that they are willing to learn the language within a reasonable period.

The Department of Biology has a teaching staff of 20 members plus a few post-doctoral fellows, working in the following fields: cell biology, terrestrial animal ecology, marine ecology, entomology and general physiology.

Inquiries and application should be forwarded to: Dr. Lucien Huot, directeur, Département de biologie, Université Laval, Québec 10, P. Q., Canada.

## PERSONALIA

W. B. Mountain, has been appointed Assistant Director General (Institutes and Services). Bill has been Director of the Entomology Research Institute, Canada Agriculture since 1969.

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E. H. Smith, assumed the chairmanship of the Department of Entomology, Cornell University, 16 November 1972.

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Jim MacNeil, Ph.D. has joined the C.D.A. Entomology Section at Summerland, B.C. He is studying the fate in the environment of pesticides used for fruit tree pest control.

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G. G. E. Scudder, Dept. of Zoology, U.B.C. has just spent three months carrying out research on Lygaeidae (Hemiptera) in Northern Queensland and the Territory of Papua, New Guinea.

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Professor Georges Maheux, Ste-Foy, Québec, has been named a Member of the Order of Canada in recognition of his research as an entomologist and naturalist.

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E. J. LeRoux, Research Branch, Canada Agriculture, has assumed the duties of Assistant Director General (Planning and Coordination). Previously Ed was A.D.G. (Institutes and Services).

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Don Leatherdale left the Scientific Information Section, CDA, at the end of 1971 after two years spent primarily in preparing the framework for the Canadian Agricultural Thesaurus, one volume of which is concerned with zoological taxonomy. Don is now in Rome, appointed by the International Development Research Centre, Ottawa, as a consultant with the AGRIS Coordinating Centre at FAO. AGRIS is being developed as an international computerized information system for the agricultural sciences and technology.

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Jacob G. Rempel is visiting Professor of Biology at the University of Victoria for the academic year 1972-1973. He is taking the place of Richard Ring, who is on sabbatical leave (see letter, page 3) After two years of retirement, Professor Rempel is enjoying it greatly. He writes, "I find the students cooperative, attentive and always correct".

## POST GRADUATE DEGREES

Roy Ellis, Ph.D., Department of Entomology, University of Manitoba, November 1972. Thesis: Delimitation of sibling species of the *Aedes communis* Degeer aggregate (Diptera, Culicidae). As an NRC postdoctorate fellow under the direction of D. M. Wood, Dr. Ellis is now preparing a monograph on the mosquitoes of Canada.

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