

Proceedings of the
Twenty-Fourth Annual Meeting
of the
ENTOMOLOGICAL SOCIETY
of
ALBERTA



October 14-16, 1976
Kananaskis Environment Centre
Kananaskis, Alberta

PROCEEDINGS OF THE 24TH ANNUAL MEETING OF THE
ENTOMOLOGICAL SOCIETY OF ALBERTA
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The Entomological Society of Alberta acknowledges with thanks the generous donation from the Dean of Science, University of Calgary.

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PRESIDENT'S REMARKS

W. A. NELSON

Welcome to the 24th Annual Meeting of the Entomological Society of Alberta. I would first like to thank Jinx Proverbs and Jerry Weintraub for their excellent mini-symposium. It has been my opinion for some years that the meetings of this Society have not heard about the sterile insect release method of population control since it was first successfully used in screwworm eradication on the island of Curacao. I therefore took it upon myself to invite both of these sterility-oriented experts to combine forces for this meeting.

I have enjoyed the past year as President of this Society. It has been an interesting year for us entomologists. Some of us did some research--others didn't. There was an International Congress this year--nearby for a change. A few of us made it to Washington D.C.--most of us didn't. I must give recognition and thanks to those who backed out so that others could go--such others as one coleopterist and one ectoparasitologist who were taking part in specialist meetings. In spite of fiscal restraints, the registration at this Congress was one of the highest--about 2,500 from some 70 countries: so there must be money somewhere.

And yet locally we appear to have a problem developing, and your president last year very ably outlined the reasons why entomologists are needed more than ever. Government appears to have ignored such plain facts. The way things are moving presently, especially with staffing constraints in the federal government, I can see in tens years' time a total of about 20 professional entomologists in all of Alberta: 15 in Edmonton, 4 in Lethbridge, and 1 in Calgary. This does not include students, whom I consider the most important members of the entomological community. In the future, it might well be considered feasible to entertain joint meetings with the Entomological Societies of Saskatchewan and of British Columbia.

During this meeting you will be asked to consider a resolution on the state of entomology in Alberta. You gave us free rein last year to act as we saw fit on this question. Yet your committee, chaired by Larry Jacobson, felt that some further direction from members was necessary before action was taken. The Entomology Manpower Report of the Entomological Society of Canada has just been published in their Bulletin, and this may color the action that you wish this Society to take.

It has always been my opinion that fundamental training in the basics of morphology, taxonomy, physiology, ecology and economic entomology would provide students with the tools to enter any phase of entomological research. Having said this, I am really just echoing the

the statement made by our president, Alex Harper, last year. Notwithstanding the freedom of choice of the individual student--and notwithstanding the ivory tower attitude of Canadian university departments (with which I am most sympathetic)--it seems to me incumbent upon these departments to be continually aware of the current philosophy of government and industry, and to try insofar as possible to provide the type of graduate who is in most demand (if indeed there is any demand). To this end it might be wise for universities to consider allowing more students to complete their thesis requirements on location under seasonal workers in the field (government or industry). Such a course is not without precedent, as some universities long ago have allowed for such action.

I would like to mention two matters in closing: First, I must convey my thanks to the Dean of Science, University of Calgary, for a substantial financial donation towards the success of this meeting, and next, the final report of the Alberta Environment Authority on Pesticide Use is now out, and since this Society had a substantial input into this investigation, I would urge all members to read this report.

I now declare part one of the business meeting of this Society in session.

PROGRAM SYNOPSIS

THURSDAY EVENING

- 7:00 Executive Meeting
- 7:30 Registration and Reception

FRIDAY

- 8:00 Breakfast
- 8:30 Registration
- 8:45 Introductions
 Dr. K.W. Richards, C.D.A., Lethbridge
 Dr. W.A. Nelson, C.D.A., Lethbridge
- 9:00 Feature Speaker - Dr. M.D. Proverbs
- 10:00-10:30 Submitted Papers
- 11:00-12:00 President's Address
 Business Meeting
- 1:30- 4:30 Sumbitted Papers

FRIDAY EVENING

- 6:00 Socialize
 Dinner
- GUEST SPEAKER
- Peter Schlederman, Archeologist
 University of Calgary

SATURDAY

- 9:00-10:30 Submitted Papers
- 10:30 Business Meeting, continued
- 12:00 Adjourn

ABSTRACTS OF SUBMITTED PAPERS BY MEMBERS
OF THE ENTOMOLOGICAL SOCIETY OF ALBERTA

THE STERILE INSECT RELEASE METHOD FOR CODLING MOTH
CONTROL IN BRITISH COLUMBIA ORCHARDS

M. D. Proverbs
Research Station, Agriculture Canada
Summerland, British Columbia

The codling moth, *Laspeyresia pomonella* (L.), is the most serious pest of apple in the Pacific Northwest and in many other apple-growing areas throughout the world. At present, the only commercial method of control is by chemical sprays. Unfortunately this practice has often caused or contributed to greatly increased mite populations, destruction of beneficial insects, insecticide resistance, soil poisoning and other problems. Implementation of the sterile insect release method of control for codling moth would eliminate or alleviate a number of these problems.

Research on the feasibility of using the sterility procedure against the codling moth was started in British Columbia in 1956. It was found, when mature male pupae (within 1 day of eclosion) or adult male moths were exposed to a partially sterilizing dose (25 krad) of gamma radiation and then crossed with untreated females, that the progeny were more sterile than the irradiated P₁ males. However, the obvious drawback to use of inherited sterility as a control measure is that the F₁ progeny must be reared in the field on a host crop. Since it seemed very unlikely that growers would accept the use of inherited sterility with a high-priced crop like apple, it was decided to rely on release of fully sterile insects.

Laboratory work showed that exposure to 40 krad would induce complete sterility in the female moth and almost complete sterility in the male without seriously affecting mating, adult longevity, or flight. Experiments with caged apple trees, in which various numbers of sterile males were added to fixed numbers of fertile male and female moths, indicated that the ratio of sterile to fertile males should be at least 20:1, and preferably 40:1, in order to induce a rapid decline in a wild codling moth population.

After detailed flight, mating and behavioral studies, we were ready in 1961 for field assessment of the sterility procedure. Sterile male moths were released in a small, semi-isolated block of abandoned apple trees for 3 consecutive years. The releases were made from ground

stations 3 times weekly starting at the pink bud stage of apple, i.e., about 1 week before wild adult moths start to emerge in the field, and were discontinued in late September when moth reproduction has virtually ceased due to the onset of cool fall weather.

During the first year of release, the ratio of sterile (released) to fertile (wild) males, as determined by sex attractant traps, was not maintained at a sufficiently high level to give good codling moth control. However, with improvement in rearing procedures, the ratio of sterile to wild moths during the next 2 years was held at or above 20:1, and the wild population was almost eliminated.

In subsequent experiments in abandoned and commercial orchards it was shown that release of sterile males plus sterile females was about as effective as release of sterile males alone, so the expensive procedure of segregating the sexes was eliminated.

Development of an artificial diet for laboratory rearing allowed us to produce enough moths to assess the sterility method in 400 acres (21 orchards) during the early 1970's. Codling moth control was excellent despite some reinfestation from nearby untreated orchards. Furthermore, fewer chemical sprays were needed to control other pests than in most commercial orchards where codling moth control was by chemical sprays.

As a result of a cost sharing agreement between cooperating fruit growers and the Governments of Canada and British Columbia, an area wide program of codling moth control by the sterility method was initiated in the Similkameen Valley in 1976. The primary objective is to determine whether the method is feasible on a commercial scale. Control in 800 acres (about 90 properties) was very encouraging during 1976. The method will be expanded to about 1200 acres in 1977, and probably to the entire Similkameen Valley (about 1600 acres of apple and pear) in 1978.

THE STERILE MALE TECHNIQUE FOR *HYPODERMA*: BACKGROUND AND PROGRESS IN A PILOT-SCALE STUDY

J. Weintraub
Agriculture Research Station
Lethbridge, Alberta

A life table was compiled, based on 13 years data, assessing the impact of natural mortality factors on the persistence of *Hypoderma* populations and their potential recovery from insecticidal control. A significantly high and density-related mortality in the first-instar larvae was identified as a key factor. It functioned to stabilize the grub populations, limiting excessive population growth and permitting increased survival at low population levels. Systemic insecticides impose additional mortality at this larval stage but the population is adapted to minimize the impact through

the density-related nature of the mortality. Characteristics of puparial development and behavior of the warble flies also act to perpetuate reduced populations by concentrating the flies phenologically and geographically to facilitate reproduction.

A pilot-scale study was instituted to release only *H. lineatum* flies, sterilized by 4000-4500 rad, on a commercial cattle ranch on which the warble grub populations were reduced by insecticidal treatments over 3 years to base-line levels <2 grubs per animal. Techniques have been developed to rear the larvae in segregated cattle hosts, to collect the mature larvae and manage the pupal development to schedule the irradiation (by Dr. M.D. Proverbs of Summerland, B.C.) and emergence of flies for prompt release synchronized with field emergence of warble flies. Samples of sterile flies were tested for degree of sterility in the laboratory. Prior studies at warble fly mating sites in the field showed acceptable vigor and competitiveness of the sterile flies with normal flies.

Monitoring of grub populations on the ranch in both treated and untreated cattle showed that after the first season of releases there were no *H. lineatum* larvae in about 400 cattle examined, whereas low levels of *H. bovis* persisted. Neighboring ranches, which also treated their cattle with insecticides under provincial legislation, had persistent low levels of both species. We are thus encouraged to continue the sterile *H. lineatum* releases, initiate *H. bovis* releases and ultimately to discontinue in phases both the insecticidal treatment and the sterile fly releases when population monitoring so indicates.

HIGH SPEED CINEPHOTOGRAPHIC STUDIES OF LARVAL BLACK FLIES FEEDING

D. A. Craig
University of Alberta, Edmonton, Alberta

High speed cinephotography (300 fps) shows that the complete closing cycle of the aquatic fan for *Simulium vittatum* larvae is only 30 milliseconds.

Detailed movement and interaction of the fan, mandibles and maxillae could also be seen.

VERTEBRATE RESISTANCE TO A BITING FLY:
RABBIT/TSETSE FLY MODEL

K. Parker

University of Alberta, Edmonton, Alberta

The results of 3 experiments show that naturally developed resistance in Flemish Giant X Lop Ear rabbits affect tsetse (*Glossina morsitans morsitans*) biology. In the first two experiments, mortality was higher in female flies maintained on previously exposed rabbits than in female flies fed on previously non-exposed rabbits. Male mortality was not affected. During the first 5 larviposition cycles, pupae produced by flies fed on previously non-exposed rabbits were heavier than pupae produced by flies fed on previously exposed rabbits. The number of pupa/female/cycle and percent emergence were not significantly different, however the number of pupa/female/cycle was generally greater when flies were maintained on previously non-exposed rabbits.

In a third experiment, to test for skin resistance, 4 rabbits had colony flies fed on their left but never on their right ear. After 6 months the meal sizes taken by teneral flies from the right and left ears were determined. For six of eight tests, flies took larger meals from the right ear than from the left; however the differences were never statistically significant. The rabbits were paired on the basis of greatest or least differences in meal weights between the previously exposed and the previously non-exposed ear. For flies maintained on the pair of rabbits with the greatest differences in meal weights between ears, the populations fed upon the previously exposed ear had higher mortality and produced lighter pupae. For flies maintained on the pair of rabbits with least differences in meal weights between ears, the population fed on the previously exposed ear produced lighter pupa but had the same mortality as the controls. The mechanism of resistance appears to be due to skin resistance, however tests are planned to determine if antibodies are involved.

ORIOUS TRISTICOLOR (HEMIPTERA: ANTHOCORIDAE)
A PREDATOR IN ALFALFA

J. N. Harrowing and A. M. Harper
University of Lethbridge and Agriculture Canada
Lethbridge, Alberta

Orius tristicolor was the only species of *Orius* Wolff that was positively identified from southern Alberta alfalfa fields. Females outnumber males in early and mid-summer at which time males become more numerous than females. Population levels of *O. tristicolor*, if allowed to build up naturally in an alfalfa seed field, seemed to reach a peak in early August and then drop off with the approach of autumn. In hay fields the population increased until the alfalfa was cut and then the numbers dropped sharply. Females are similar to males in appearance, however they are much larger. Virgin females do not appear to produce viable eggs. *Orius tristicolor* is a general predator, feeding on a variety of insects and mites found in alfalfa.

ENTOMOPHTHORA CULICIS, A FUNGUS PARASITIC ON BLACK FLIES

J. A. Shemanchuk
Agriculture Canada Research Station
Lethbridge, Alberta

Entomophthora culicis, a fungus belonging in the order Phycomycetes, was found parasitizing adults of *Simulium venustum* and *Simulium vittatum*. This fungus was first discovered in Flat Creek in Athabasca County in 1973. During the summers of 1974, 1975, and 1976, this fungus was found in other small streams in central Alberta, indicating that this fungus is well established in the area.

Infected flies usually appear in early July and are present through to mid-September.

This is the first known record of *Entomophthora culicis* in Alberta and possibly the first record in Canada.

THE MORPHOLOGY OF THE COMPOUND EYE OF
CICINDELA TRANQUEBARICA HERBST (COLEOPTERA: CICINDELIDAE)

J. E. Kuster
University of Alberta, Edmonton, Alberta

The morphology of the compound eye of *Cicindela tranquebarica* was examined by light and scanning electron microscopy, cryofracture SEM, thin section transmission electron microscopy, and freeze-etch TEM techniques.

The light preceiving trioptric apparatus consists of a biconvex laminated cuticular corneal lens, a nine banded helically arranged cuticular sub-corneal layer, and a crystalline cone. Four Semper's cells secrete the four quadrants of the cone. A four membered elongation of Semper's cells constitutes the crystalline thread.

Distally, the rhabdome is elliptical in cross section with the microvilli oriented parallel to the seven retinula cells. The nuclei of the retinula cells are located at this level. Processes of Semper's cells containing microtubules are situated between the membranes of retinula cells: 1/2, 3/4, 5/6, 6/7. Proximally, the fused rhabdome is cross shaped having the microvilli of adjacent retinula cells perpendicularly arranged. The seventh retinula cell is eccentrically displaced and does not contribute to the rhabdome. At this level, the retinular cytoplasm is rich in mitochondria..

Each of the seven retinula cells forms an axon which surrounds the eighth or basal retinula cell. The basal retinula cell has a rhabdome with the microvilli parallel to the longitudinal axis. Eight axons from each of the 4000 ommatidia penetrate the tracheated basement membrane.

Two primary pigment cells containing rough endoplasmic reticulum envelop the cone and thread. Approximately 16 secondary pigment cells containing pigment granules shroud the retinula cells. Basal pigment cells surround the eighth retinula cell, penetrate the basement membrane, and surround glial cells.

From the inter generic comparisons of cicindelids, the photopic eye of this diurnal tiger beetle represents the apomorphic state in the transformation series from a nocturnal beetle having a scotopic eye plan.

NABID REPRODUCTION IN SOUTHERN ALBERTA

Lynn Richards and A. M. Harper
Agriculture Canada Research Station
Lethbridge, Alberta

Three species of *Nabis* were found in southern Alberta during insect surveys of alfalfa fields in 1976. These insects are predators of a variety of other insects. The most common species was *Nabis alternatus*. Laboratory studies on *Nabis alternatus* showed that females lay about 100 eggs in a life time with nearly 60 of these hatching. This insect overwinters as an adult with the greatest ovarian development in the spring. Two internal parasites were identified from *Nabis alternatus* as *Leucostoma simplex* in 6-14% of the females and *Wesmaelia pendula* in 5-15% of the males.

MOUTHPART STRUCTURE AND FUNCTION IN LARVAL THYSANOPTERA

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

The head of larval *Haplothrips verbasci* (Osborn) is produced ventro-caudad as a mouthcone formed of the labrum in front, the maxillary stipes on either side and the labium behind. Both maxillary and labial palpi are well-developed but otherwise the principal feeding structures are like those of Hemiptera. These consist of cibarial and salivary pumps, the hypopharynx and 3 stylets: the left mandible (the right one degenerates during embryogenesis) and 2 long maxillary stylets.

The mandible is equipped with powerful retractor muscles but no protractors and probably works with a "punching" mechanism assisted by contraction of the cephalic depressor muscles. The 2 maxillary stylets work together as a unit and are equipped with both protractor and retractor muscles. The margins of the left stylet are longitudinally grooved to receive the ridged margins of the right stylet. The combination encloses a food canal but no salivary canal.

Movements of the various parts during feeding is described.

CHEMICAL CONTROL OF A MIDGE *CONTARINIA VIRGINIANIAE* (FELT) AND
A SEED BORING SAWFLY *HOPLOCAMPA LACTEIPENNIS* ROHWER IN ALBERTA

J. A. Drouin and D. S. Kusch
Northern Forest Research Centre, Edmonton, Alberta

A chokecherry midge, *Contarinia virginianiae* (Felt) causes the seed to abort and premature dropping of enlarged fruit. A seed borer, *Hoplocampa lacteipennis* Rohwer also causes extensive damage to chokecherry fruit. Chemical tests with three systemic insecticides were conducted in 1975 and expanded to eight in 1976 to control both insect species. Plots were located at Devon in mixed chokecherry, pincherry and Saskatoon stands along the river's edge and were replicated one tenth acre units.

A backpack SOLO mistblower was used to apply seven of the eight insecticides and a TOT 2S gravity-fed ultra low volume sprayer was used to apply the oil based formulation (pbi Turbair) containing Malathion. Timing is critical and chemical application should coincide with the opening of the flowers to commencement of petal drop.

Results indicate excellent controls on both insect species with all the systemics tested including an increase in fruit production. However, some phytotoxicity may occur to the foliage since *Prunus* and *Amalanchier* sp. are very susceptible to systemic insecticides. If aesthetics are of major concern, judicious applications of Resmethrin, Malathion, Metasystox-R, Diazinon and Baygon 1.5 EC, in that order will give good results with minimal phytotoxicity.

EVIDENCE THAT RESISTANCE IN ALFALFA TO THE PEA
APHID, *ACYRTHOSIPHON PISUM* IS CONTROLLED BY
SALTS OF CHARACTERISTIC ORGANIC ACIDS

NO ABSTRACT AVAILABLE

STUDIES OF THE SEX PHEROMONES OF TWO NEW ZEALAND TORTRICIDS

Ross Galbreath*, H. Young[†], and M. H. Benn**

*Entomology Division, and [†]Plant Diseases Division, D.S.I.R., Auckland, New Zealand, and **Department of Chemistry, University of Calgary, Alberta

Ctenopsestis obliquana and *Planotortrix excessana* are two economically important leaf-roller pests of *Actinidia chinensis* ("Kiwifruit"). A study of the sex pheromones of these moths was undertaken, using the Roelof's technique of electro-antenogram assay of gas chromatographically fractionated materials. Mass fragmentometry was also used. We concluded that the principal pheromone emanating from females of both species was Z-8-tetradecenyl acetate. Tetradecyl acetate was also identified in *P. excessana* but not in *C. obliquana*. An unidentified tetradecenyl acetate was present in small amount and may be important for differentiating the pheromone. In the field Z-8-tetradecenyl acetate trapped males of both species.

REATTACHMENT OF LARVAL BLACK FLIES AFTER INSECTICIDE TREATMENTS

D. A. Craig
University of Alberta, Edmonton, Alberta

Mortality of larvae detached with Abate 200E and Methoxychlor were investigated. The LC 50 for detached larvae was only 0.11 ppm for Abate and 0.028 ppm for Methoxychlor.

TERATOLOGY IN THE SAWFLY GENUS *PRISTIPHORA*
(HYMENOPTERA: TENTHREDINIDAE)

H. R. Wong
Northern Forest Research Centre, Edmonton, Alberta

Tetralogical aberrations in the hind thoracic legs of *Pristiphora erichsonii* (Hartig) and *Pristiphora geniculata* (Hartig), and antenna of *Pristiphora banksi* Marlatt were described and shown. The probable cause of these abnormalities was discussed.

FOOD VALUE OF AN APHID AND ITS HOSTS

A. M. Harper and M. S. Kaldy
Agriculture Canada Research Station
Lethbridge, Alberta

Pea aphids were equal or superior in nutrient value to their hosts, broad beans and alfalfa. They contained about 21% dry matter. They also contain 11% fat, 7% sugar, and 56% protein on a dry matter basis.

Broad beans contained $1/2$ the amount of dry matter, $1/3$ as much fat, about the same amount of sugar, and $4/5$ the amount of protein as the aphids.

Prebloom alfalfa contained the same amount of dry matter and about $1/2$ as much fat and protein as the aphids and $1/5$ as much sugar.

Alfalfa at 10% bloom contained the same amount of dry matter and about $1/2$ as much fat, protein, and sugar, as the aphids.

Kananaskis	and grounds	Mountain sunshine break	M. Proverbs W. Nelson
Food Line	J. Weintraub M. Proverbs E. Benton	Registration	Insect Collection
Opening Session	M. Proverbs	Okanagan road map	E. Benton G. Griffiths
E. Swailes and reflection	Grubs, grubs, grubs!	J. Weintraub	W. Nelson B. Khan H. Philip
Rabbit vs. Tsetse fly	K. Parker	O. tristicolor	J. Harrowing J. Shemanchuk
H.R. Wong	J. Kuster	D. Craig	feeding blackfly L. Richards and friend
Ursus thripsi again!	B. Heming	J. Drouin	Presentation ← ← E. Hall R. Gooding



TWENTY-FOURTH ANNUAL MEETING - KANANASKIS-1976

W. Nelson G. Ball and group			W. Charnetski	D. Szlabej	J. Kuster J. Harrowing	
Our Projectionists	D. Craig	H.R. Wong	A. Harper	B. Heming	H. Cerezke W. Nelson	
J. Shemanchuk H. Cerezke G. Hilchie E. Hall	M. Benn	Arena		H. Philip K. Parker H. Wong D. Craig G. Griffiths	M. Reddy M. Steiner	
K. Richards	Flap Flap!	G-R-R-R-!	THE SHADOW!	"Bug"?	B. Heming Ursus thripsi	
E. Gushul Smile!	D. Struble	Who me?	Butterfly Panorama	J. Slater	K. Ball	D. Craig
J. Drouin K. Heming	M. Steiner R. Gooding	The group of 9		The group of 10		K. Ball
P. Schederman	Archeology in Greenland					G. Pritchard



ENTOMOLOGICAL SOCIETY OF ALBERTA

MINUTES OF EXECUTIVE MEETING

April 30, 1976 - 1:30 p.m.

A meeting of the Executive was held April 30, 1976, at the Research Station, Canada Agriculture, Lethbridge, Alberta. Present were Dr. W.A. Nelson, Dr. A.M. Harper, Dr. W.A. Charnetski, Dr. B. Heming, and Dr. H.F. Cerezke.

- 1) The President, W. Nelson opened the meeting and called for adoption of 1975 Executive and General Business Minutes. A. Harper moved, W. Charnetski seconded they be adopted.
- 2) Dr. H. Cerezke presented an interim financial report, indicating a bank balance as of April 30, 1976, of \$2,196.16. Items to be deducted from this include \$950.00 for loan and purchase of 300 insect collection boxes and up to \$450.00 for postage, publishing 1975 ESA Proceedings, E.S.A. Student Prizes, and printing of ESA letterhead and envelopes.

With incoming dues for 1976, the total bank balance is expected to be reduced to between \$700.00 and \$800.00. Three items discussed in connection with the financial report included purchase of the insect collection boxes, and printing of new stationary and expenses incurred by the Regional Director while attending ESC Board of Governor's Meetings.

Dr. H. Cerezke reported that the 300 plastic boxes had arrived from Vlchek Plastics, Ohio, and that shipping charges, customs and sales tax had to be paid.

Dr. H. Cerezke reported the present stock of ESA stationary supplies as low. A. Harper volunteered to check out reprinting supplies in Lethbridge where the last supply was obtained. A rough estimate from Robins Printing for supplying 3000 letterheads and 1000 envelopes was quoted as \$69.00.

Dr. W. Charnetski expressed his concern for ESA paying Reg. Dir. expenses, and stated he felt ESC could afford to pay. He stated he would like to present a motion to this effect at the next Board of Governor's Meeting if the ESA Executive gave their approval. No final agreement was reached.

- 3) Dr. A. Harper suggested ESA consider buying up Dr. B. Hocking's share remaining in the "Insect Collectors Guide" for Mrs. J. Hocking. B. Heming volunteered to discuss this with Dr. G. Ball.

- 4) Honorary Membership in ESA-- The topics of honorary members and scholarships were discussed and a number of suggestions were made as follows:
 - Dr. G.A. Hobbs was suggested for honorary membership in ESA and ESC;
 - Mr. E.T. Gushul was suggested for hon. mem. in ESA;
 - Hold an annual meeting to emphasize contributions of amateur entomologists;
 - Initiate "Carr Entomological Scholarship" (father and son were collectors);
 - Consider U. of A. collection to be named after Brian Hocking: A motion was made by A. Harper that the present Entomological Society of Alberta Prize be changed to the "Brian Hocking Entomological Society of Alberta Prize". Seconded by W. Charnetski, carried. B. Heming agreed to discuss this motion with U. of A. entomology staff.
- 5) Concern for Entomology in Alberta-- In reference to this topic from the 1975 minutes and the formation of a committee consisting of L. Jacobson, G. Ball and J. Gurba, A. Harper reported a lot of documentary information had been gathered. W. Nelson stated he would review the topic with L. Jacobson for action and a report for the 1976 Annual Meeting.
- 6) Dr. W. Charnetski provided a brief report of some highlights of the ESC Manpower Study and indicated a report would be released later this year.
- 7) Achievements Award Committee-- W. Charnetski proposed the Exec. of the ESA be this committee with Reg. Dir. as chairman. All agreed. He further suggested that names of potential recipients could be put forth at the Exec. meetings and that someone especially proficient in writing critiques be nominated for preparing background documentation. This should be done in confidence without nominee knowing of his or her selection.
- 8) A letter from the Alberta Environment Conservation Authority was read and discussed, re an invitation for ESA to nominate two representatives to serve on Public Advisory Committees of ECA. The Secretary was instructed to obtain more information on commitments for this committee and to send letters of the information with suggested names to Lethbridge, U. of A. and other locations as necessary.
- 9) Dr. W. Charnetski reported as Reg. Dir. to ESC on the following topics:
 - NRC grant to ESC for publishing Can. Ent. now deleted
 - Editorial problems of Can. Ent.
 - Finances of ESC generally in good condition
 - Membership committee - in poor shape

- Publicizing entomology - some concrete things to come
- Fee structure - ESC recommends each prov. Soc. to collect its own dues
- ESC considering to publish books
- Average page costs of Can. Ent. now up to \$61.00
- Scholarship Committee; first ESC Scholarship of \$500.00 awarded to Mr. G. Hilchie, a student at the University of Alberta.
- Report of Science Policy Committee
- ESC may be asked to rejoin as member in B.C.C.
- First draft of Biological Survey of Insects of Canada held back
- 1977 ESC meeting to be in Winnipeg; 1978 ESC meeting was proposed by W. Charnetski to be in Edmonton, but will likely be in Ottawa since it will be the first meeting to be held independently of regional sponsorship.

- 10) Annual Meeting of Ent. Soc. Alta., 1976-- W. Nelson reviewed his correspondence with G. Pritchard in regard to holding the 1976 meeting at Kananaskis. The Environmental Centre (U of C) will be available for the general meeting and it is fairly certain YMCA facilities 6-7 miles away will be available for accommodation. Suggested dates are October 7-9.

The Committee responsible for Program and Notices will include the following persons from CDA Lethbridge (subject to their acceptance): K.R. Depner, P.E. Blakeley, K.W. Richards and J. Weintraub.

Local arrangements will be made by G. Pritchard and R.C.B. Hartland-Rowe.

Dr. W. Nelson will contact the nominees and inform them of their responsibilities.

- 11) Dr. W. Nelson noted the Biting Fly Institute had been approved by C.A.S.C.

The meeting adjourned at 4:30 p.m.

H. F. Cerezke
Secretary-Treasurer

MINUTES OF EXECUTIVE MEETING

October 14, 1976 - 7:00 p.m.

A meeting of the Executive of the Entomological Society of Alberta was held October 14, 1976, at the University of Calgary Environmental Sciences Centre (Kananaskis). In attendance were Dr. W.A. Nelson, Dr. A.M. Harper, Dr. W.A. Charnetski, Dr. B. Heming, Dr. G. Pritchard, Mr. J.A. Drouin, Dr. R.H. Gooding and Dr. H.F. Cerezke.

- 1) The minutes of the previous Executive meeting were adopted on a motion by A. Harper and W. Charnetski.
- 2) Dr. H. Cerezke reported that the total funds in E.S.A. treasury as of September 28, 1976, was \$1,191.50. An interim report on membership in E.S.A. was also given.
- 3) Honorary Membership in ESA-- This topic was discussed and several names were suggested to possibly fill the two vacancies presently available. Action was left for 1977 business.
- 4) Honorary Membership in ESC-- W. Charnetski reported that there was possibly one vacancy for honorary membership in ESC, and suggested that Dr. G.A. Hobbs name be given support by ESA for submission to ESC. The idea of preparing a contingency list of names from the ESA membership for future submission to ESC when new honorary membership vacancies arise was also discussed.
- 5) Twenty-fifth Annual Meeting Theme-- A suggestion was made that since 1977 was to be the 25th Annual Meeting of ESA, an appropriate theme would be to provide some form of recognition to the contributions of amateur entomologists.
Motion: W. Charnetski moved, R. Gooding seconded that the 25th annual meeting be set up to recognize and encourage amateur entomologists to take part.
Carried: R. Gooding suggested a scroll might be prepared which would cite specifically their valued contributions.
Motion: A. Harper moved, G. Pritchard seconded that the next executive look after the selection of amateurs and preparation of scrolls.
Carried: Other suggestions were that a copy of the proceedings with appropriate citation be presented to those selected, and that the 25th Proceedings be bound in hard cover as a special issue.
- 6) Dr. B. Heming reported that the suggestion made earlier for ESA to buy remaining stocks of "Insect Collectors Guide" was not favored by entomology staff at U. of A.

- 7) Resolution on the State of Entomology in Alberta-- It was reported that this resolution had been completed and that a copy had been typed. However, a need was expressed for further editorial work before the final copy of the resolution could be presented. It was suggested that G. Ball read the resolution at the general meeting and obtain a consensus from the membership.
- 8) Awards Committee-- W. Charnetski suggested an awards committee should be established by each regional society to assist selection of entomologists deserving awards, and to take advantage of the three awards offered by ESC. The matter was deferred to the general business meeting.
- 9) ESA Representation on Alberta Environment Conservation Authority-- It was noted that J. Shemanchuk was now ESA's representative to ECA's public advisory committee.
Motion: W. Charnetski moved, A. Harper seconded that J. Shemanchuk be empowered to select a second member if necessary. Carried.
- 10) Biting Fly Institute-- W. Nelson reported there was no news regarding the location of this Institute.
- 11) An item from the Secretary's correspondence was the request that future ESA Proceedings carry on its front cover the number ISSN 0071-0709 (International Standard Serial Number).
- 12) The Secretary noted that the 1975-76 recipient of ESA Prize was Mr. W. B. Barr, a student from the University of Alberta.
- 13) In recognition of his valued photography service at the 24th Annual Meeting A. Harper moved, R. Gooding seconded that an honorarium be paid to E. Gushul. Carried.
- 14) Dr. R. Gooding moved, A. Harper seconded that the society pay room and board expenses and mileage (@ .15¢/mile) to Dr. M.D. Proverbs as guest speaker. Carried.
- 15) Edmonton and Olds were suggested as possible choices to hold the 1977 ESA Annual Meeting. It was suggested the Executive be empowered to decide the location and that B. Heming could approach B. Godwin of the Olds Agricultural College to determine whether accommodation there would be adequate.
- 16) Dr. W. Charnetski requested directions from the Executive on topics that might be brought up at the ESC Board of Governors' meeting. Some discussion followed on the subject of payment of room and board to the ESA Regional Director while in attendance at ESC meetings. The topic was referred to the general business meeting for approval of payment.

- 17) Special Committees and Reports-- With regard to the establishment of future committees R. Gooding suggested that the dead line for any reports prepared be completed and that they be in the hands of the Secretary by April so that they could be circulated with the agenda of the spring Executive meetings.

Meeting was adjourned.

MINUTES OF THE 24TH ANNUAL MEETING OF THE E.S.A.

October 14-16, 1976

The 24th Annual Meeting of the Entomological Society of Alberta was held at the University of Calgary Environmental Science Centre, Kananaskis, Alberta, October 14-16, 1976.

- 1) The minutes of the previous Annual Meeting were adopted as printed in the 23rd Proceedings of the ESA on a motion by H. Cerezke, seconded by A. Harper. Carried.
- 2) Dr. H. Cerezke presented an interim financial report, indicating there was approximately \$1,191.50 in the treasury at the start of the meeting. H. Cerezke moved its adoption, seconded by W. Charnetski. Carried.
- 3) As of October 12, 1976, the Secretary reported total membership in the Society was 84, including 72 members paid up to 1975 and 1976, 10 new members (1976) and 2 honorary members.
- 4) ESA Prize Recipient-- G. Ball announced that the 1975-76 recipient of this prize was U. of A. student, William Brian Barr, who was in attendance at the meeting.
- 5) The following committees and respective members were announced:

Nominations:	B. Heming (Chairman) E. Swailes
Resolutions:	H. R. Wong (Chairman) J. Shemanchuk
Insection Collections:	H. Philip (Chairman) K. Richards B. Stumpf
Auditors:	J. A. Muldrew J. A. Drouin
- 6) Dr. H. Cerezke reported on the purchase of 300 new insect collection boxes by the Society and indicated they had been received by the Entomology Dept. at the U. of A.
- 7) Dr. G. Ball reported there was no report for the Common Names Committee.
- 8) Regional Director to ESC Report-- W. Charnetski, presented his report on the years' activities and moved its adoption as read, seconded by K. Richards. Carried. A copy of the RD report will be printed in the 24th Proceedings.

Dr. W. Charnetski expressed regrets on behalf of Dr. G. Cooper, Pres. of ESC, for not being able to attend the ESA meeting.

Recipients of the ESC awards were announced as follows:

C. G. Hewitt Award:	Dr. B. Heming
Entomological Society of Canada Student Award:	Mr. G. Hilchie

Congratulations were extended to both recipients for their worthy achievements.

As Chairman of ESC Scholarship Fund, J. Shemanchuk reported that only \$26,000.00 had been raised. He indicated there were two additional members on this committee, one in Ottawa and one in the Maritimes. Because of the problems of raising money for the Scholarship Fund J. Shemanchuk suggested ESA membership might consider making a donation. The original plan of this committee was to raise \$2,500.00-3,000.00 per year for scholarship but until this objective is reached, the funds will be considered an award.

- 9) Honorary Membership in ESC-- W. Charnetski reviewed this subject indicating there was one vacancy, and asked for nominations since he is a member of the ESC nominating committee for honorary membership. J. Shemanchuk moved, W. Charnetski seconded that Dr. G. Hobbs name be submitted. Carried.
- 10) Donation to Zoological Record-- G. Ball moved, D. Craig seconded that ESA again make a donation of \$25.00. Carried.
- 11) Insect Survey of Alberta-- A recent letter on the subject from the Hon. H. Schmid was read to the membership. The discussion that followed was in regard to what further work ESA should do as a follow-up toward supporting such a survey. W. Nelson wound up the discussion by suggesting ESA reply as in the original vein of the report already submitted with documentation and an updated report of the status of the national survey, and perhaps pointing out the disappointments seen in existing displays at the Museum.
- 12) Honorary Membership in ESA-- Documentation on one nominee, Dr. G. Hobbs, was read by the President and a secret ballot was distributed for acceptance of G. Hobbs as honorary member. The vote was unanimous in favor of acceptance. W. Nelson was to notify G. Hobbs of the Membership decision.
- 13) Dr. W. Nelson reported that no action had been taken by the bodies responsible for the choice of Canadian Centre for Biting Flies.

- 14) The location of the 25th Annual Meeting of ESA was reviewed but it was decided to leave the matter in the hands of the new executive (re motion of Charnetski and Gooding in Exec. Minutes, Oct. 14, 1976). The suggestion was left with the Executive to explore holding the meeting at Olds, and if not suitable, then Edmonton.
- 15) Resolution on State of Entomology in Alberta-- It was pointed out that the ESC Manpower study of Entomologists was now out. Discussion followed as to how to handle the Alberta resolution, or how the two reports might be combined. G. Ball read the Alberta resolution to the membership, pointing out that the report needed revision before submission. He felt the national report could be supported by motion without submitting the Alberta report. W. Charnetski agreed but thought ESA should support the Alberta report and send it to the Ministers concerned, indicating our concurrence with the ESC report and attaching a copy of it. Submission of only the ESC report was not favored since it was pointed out that one or two important points not contained in the ESC report needed to be emphasized. These concerned specific conditions pertaining to Alberta. W. Nelson called for a motion that ESA draft a letter summarizing the pertinent points contained in the Alberta report, attach a copy of the ESC report, and send to various federal and provincial Ministers, Members of Parliament and Opposition Leaders. The letter should point out that there is no indication basic and applied research in entomology was to be expanded in Alberta and that no reduction in federal research laboratories in western Canada should take place.

Dr. R. Gooding moved, seconded by J. Shemanchuk that the President draft the letter as outlined above and send to the various governmental representatives. Carried.

- 16) Local Awards Committee-- W. Charnetski asked that a committee be established whose function would be to collect names and supportive information which could be forwarded to the national nominating committee. R. Gooding moved, A. Harper seconded that the President and Past-President be a standing committee to obtain and submit names for nominations. J. Weintraub amended the motion that the Reg. Dir.'s name be added to the committee. Carried.
- 17) ESA Public Advisory Committee Representative to Alberta Environment Conservation Authority-- J. Shemanchuk represents ESA and has attended three meetings of ECA on the Pollution Study Group. He reported on his experience with the Pollution Study Group and suggested ESA should have a representative also on the Environmental Protection Study Group. However, it was unknown whether ESA could have two representatives, and in the interim, it was decided G. Griffiths could represent ESA's interests on the Environmental Protection Study Group since he was already a member of this group, representing National and Provincial Parks. G. Griffiths agreed to carry this function for the Society during 1977.

- 18) Regional Directors Fees for 1977-- R. Gooding moved, D. Craig seconded that ESA pay the Regional Director's room and board fees while attending ESC Board of Governor's meetings in 1977. Carried.
- 19) ESC Scholarship Fund-- G. Pritchard moved, W. Charnetski seconded that ESA make a donation of \$100.00 to ESC Scholarship Fund, made in recognition of the fact that a surplus of funds was collected at the joint ESC-ESA meeting in Banff in 1973. Carried. The basis of this motion stems from the statement prepared by G. Pritchard--"In view of the fact that the Entomological Society of Canada Scholarship Fund is a worthy cause, and also with regard to the fact that the fund was instigated as a result of remarks made by Brian Hocking at the 1973 National Meeting in Banff, I move that the Ent. Soc. of Alta. make a donation of \$100.00 to this fund, this amount to be taken from the proceeds from the 1973 meeting".
- 20) The 1977 slate of Executive of ESA was announced as follows:

President	B. Heming
Past-President	W. A. Nelson
Vice-President	J. Weintraub
Secretary-Treasurer	H. F. Cerezke
Editor	J. A. Drouin
Regional Director	W. A. Charnetski
Directors-Edmonton	R. H. Gooding (1974-77)
-Calgary	P. Scholefield (1977-79)
-Lethbridge	K. R. Depner (1975-78)

A. Harper moved, J. Shemanchuk seconded that this Nom. Comm. Report be accepted. Carried.

- 21) Resolutions Committee-- J. Shemanchuk moved, W. Charnetski seconded that the following report of the Resolutions Committee (H. R. Wong and J. A. Shemanchuk) be adopted as read. Carried.

Whereas the success of the 24th Annual Meeting of ESA can to a large extent be attributed to the following, be it resolved that letters of appreciation be sent to:

1. Dean of Science, University of Calgary for the financial assistance to the meeting;
2. Dr. Peter Schledermann for the interesting and entertaining after dinner talk;
3. The staff of the Environmental Sciences Centre (Kananaskis) for the excellent service and facilities during the meeting.

Be it further resolved that a vote of thanks be extended to the Executive and committees who were involved in the preparations for the meeting.

- 22) Insect Collection Competition-- H. G. Philip presented the following report of this year's ESA Insect Collection Competition:

Twelve collections were submitted:

- 1 from Edmonton
- 1 from Spirit River
- 1 from Lethbridge
- 9 from Olds College

Results:

Junior: one entry, Tom Boag (Edmonton) - commendation

Senior: two entries, First Prize to Allen Siemens of Lethbridge.

Open : nine entries
First Prize - Bob Prysiazny of Olds College
Second Prize - Clive Cox of Olds College
Third Prize - Randy Dunn of Olds College

- 23) The President read a letter prepared by G. Ball and G. Pritchard nominating Miss Jean Harrowing to receive the Entomological Society of Alberta Prize from the University of Lethbridge. This was the first time this prize had been awarded to a student at the U. of L., and was awarded for her scholastic achievement and keen interest demonstrated in entomology.

The meeting was adjourned on a motion by J. Shemanchuk.

H. F. Cerezke
Secretary-Treasurer

FINANCIAL STATEMENT FOR 1976

<u>Receipts</u>	<u>Subtotals</u>	<u>Totals</u>
Bank balance held in Edmonton account, (Jan. 1, 1976)	\$ 2,387.16	
Petty cash, Jan. 1, 1976	10.29	
Credit held for F. W. Faxon	1.72	
	<u>2,399.17</u>	\$ 2,399.17
Membership sales (1975) 4 @ \$4.00	16.00	
(1976) 24 @ \$4.00	96.00	
(1977) 48 @ \$4.00	192.00	
	<u>304.00</u>	304.00
Bank interest: April 30	31.43	
October 31	13.79	
	<u>45.22</u>	45.22
Annual Meeting:		
Registration: Students - 15 @ \$3.00	45.00	
Regular - 29 @ \$5.00	145.00	
	<u>190.00</u>	190.00
Subscription funds received from (F. W. Faxon)		8.00
Sale of 1975 ESA Proceedings, Colorado Library (F. W. Faxon)		4.00
Reimbursement of loan to U. of A. Ent. Dept.		123.50
Reimbursement from Receiver General of Canada		<u>100.00</u>
Total Receipts for 1976		3,173.89
Credit held for F. W. Faxon		5.72
Total Ent. Soc. Alta. Receipts		3,168.17

Disbursements

Ent. Soc. Alta. Prize: Univ. of Alberta	50.00	
Univ. of Lethbridge	50.00	
	<u>100.00</u>	100.00
Printing and duplicating 1975 ESA Proceedings		153.59
Contributions to Zoo. Soc. London (1975)	25.51	
(1976)	25.50	
	<u>51.01</u>	51.01
Annual Meeting		
Honorarium for after dinner speaker	50.00	
Symposium guest speaker (food, lodging, (registn.)	29.00	
mileage	131.40	
Drinking glasses	6.00	
Gratuity, photographic services	24.00	
	<u>240.40</u>	240.40

<u>Disbursements (Con'd)</u>	<u>Subtotals</u>	<u>Totals</u>
Insect Collection Competition Prizes (1975)	\$ 73.90	
(1976)	90.00	
	<u>163.90</u>	163.90
Room and meal costs to Reg. Dir. to attend ESC Meetings: Aug. 16-18, 1975	57.50	
Mar. 30-31, 1976	<u>50.00</u>	
	107.50	107.50
Printing 1000 envelopes, 3000 letterheads		85.81
Postage		30.65
Miscellaneous (receipt book, envelopes)		4.75
Deposit to Receiver General of Canada		100.00
Loan to Ent. Dept., U. of A. for Insect Collection Boxes		<u>958.15</u>
Total Disbursements		1,995.77

Balance

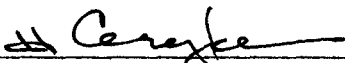
Total Receipts	3,173.89	
Total Disbursements	1,995.77	
Bank balance December 31, 1976	1,162.33	
Credit held for F. W. Faxon	5.72	
Total Ent. Soc. Alta. funds held in bank	1,156.61	
Petty cash on hand	15.79	
Total Ent. Soc. Alta. funds in Treasury December 31, 1976		1,172.40

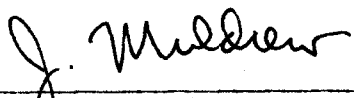
Summary of Insect Collection Competition Funds

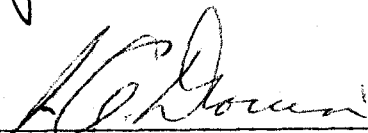
Purchase of 300 insect boxes @ \$2.18/box, U.S. funds	646.33	
Duty @ 17.5%	112.16	
Federal sales tax @ 12%	90.37	
Freight Charges	104.19	
Storage Charges	<u>5.10</u>	
Total ESA funds loaned to Ent. Dept., U. of A.	958.15	958.15
Reimbursement to ESA by Ent. Dept., U. of A.		123.50
Value of Insect Collection boxes held by Ent. Dept., U. of A., December 31, 1976		<u>\$834.65</u>

Prepared by:

Approved by ESA Auditors


 H. F. Cerezke
 Secretary-Treasurer


 J. A. Muldrew


 J. A. Drouin

REPORT OF THE REGIONAL DIRECTOR

As Regional Director, I attended the only meeting of the Governing Board of the Entomological Society of Canada (since our last meeting) at Winnipeg on March 30-31, 1977. Actions taken have been published in the Bulletin of the Socceity (Volume 8(2):7-9, June 1976).

Several significant points and accomplishments bear specific mention:

Society Operations-- Because of the failure of NRC in renewing the Publication Grant for 1975-76, the Society has decided to spend approximately \$2,200 to pay the page charges that were not covered by the NRC grant during the 1974-75 fiscal year.

The Society is considering the purchase of a building for the society in order to meet the increasing demand for space.

The Canadian Entomologist-- The publication of Can. Ent. is proceeding more smoothly through an increase in the number of reviewers, the provision of secretarial assistance for the Editor, and the combined efforts of the Treasurer, Managing Editor, Editor, Associate Editors, and the Publication Committee.

The number of manuscripts submitted have increased markedly during the year.

The Manpower Study-- The manpower study has been completed and a summarized report has been circulated through the September 1976 (Volume 8(3)) issue of the Bulletin. Everyone is urged to read this report carefully.

Medals and Awards-- This year's Gold Medal will be presented to Dr. B. P. Beirne of Simon Fraser University and the C. Gordon Hewitt Award to Dr. Bruce S. Heming of the University of Alberta.

Scholarship Fund-- The Scholarship Fund is slowly increasing but not fast enough.

The first award of \$500.00 will be made to Mr. G. J. Hilchie of the University of Alberta.

Biological Survey of Insects in Canada-- An Ad Hoc Committee chaired by Mr. J.A. Downes revised the original Survey proposal published in 1974 in the Bulletin 6(2). Department of Supply and Services suggested that the proposed project covered too long a time period and that the committee should submit a proposal for an 18 month pilot study. This shortened proposal was submitted and was signed.

W. A. Charnetski
Regional Director

*REPORT ON THE INSECT COLLECTION**COMMITTEE*

The competition consisted of twelve entries. However, nine were from Olds College and one from Spirit River, Edmonton, and Lethbridge respectively. The plastic display boxes again sold rather well.

The following prizes were awarded:

First Prize (Junior)	Tom Boag, Edmonton
First Prize (Senior)	Allan Seimens, Lethbridge
First Prize (Open)	Bob Prysiazny, Olds
Second Prize (Open)	Clive Cox, Olds
Third Prize (Open)	Randy Dunn, Olds

Tom Boag, Edmonton, a junior is to be commended on his submission. Many thanks to the assistance received in judging the collections.

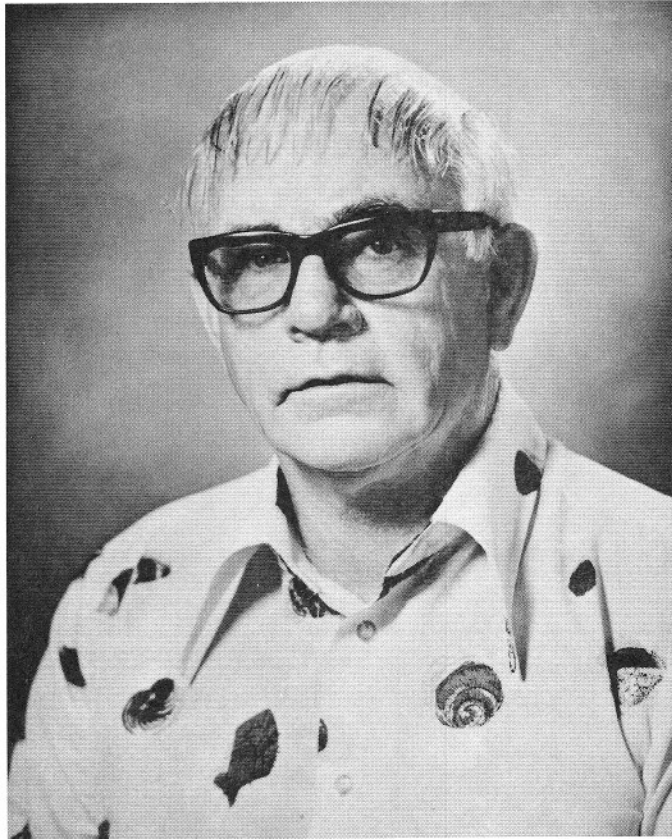
H. D. Philip, Chairman
K. W. Richard
B. Stumpf

POTPOURRI

The following items were received by the Secretary during 1976 and are available on file for anyone wishing to see them:

1. Canadian Nature Federation, Canadian Conservation Directory.
2. Notice of Mosquito Abatement Symposium, Edmonton, Alta., March 1976.
3. Report on Oshawa Second Marsh, The Oshawa Naturalists Club.
4. Monthly Notices of New Publications, Environment Canada, Ottawa.
5. Copies of White Owl newsletter called "News".
6. Copy of Bill C-253 which provides for establishment of a Canada Sea Coast Conservation Authority.
7. Information on MacKenzie Valley Pipeline Inquiry from Northern Assessment Group, Canadian Arctic Resources Committee.
8. Notice of film called "The Forest Watchers", produced by NFB of Canada.
9. The Mizushima Oil Spill, a report received from Information Services, Environment Canada.
10. Copies of "Citizens Bulletin", Environment Canada.
11. Information on a proposed Grasslands National Park in Saskatchewan.
12. Copy of report on "The Alberta Insect Survey", a proposal submitted by ESA for consideration by the Provincial Museum of Alberta.
13. Copy of Newsletter for the New School of the Environment, Banff Centre.
14. List of Canadian Nature Tours for 1977, Canadian Nature Federation.
15. Information package from Edmonton Convention Bureau.
16. Notice of the book "Conservation in Canada", a Conspectus.
17. Information on the "Montreal Translation Centre".
18. Information and Tribute to the late Jack Miner, and report on the Jack Miner Migratory Bird Foundation Inc.

19. Announcement of a meeting "Energy: The User's Problem and Response", Toronto, January 1977.
20. Sample copy of Eco/Log Week, August 1976.
21. Report on "Background to the PCB Problem and Highlights of the Task Force on PCBS".
22. Copy of a Newsletter of the Canadian NGO Participation Group on Habitat Participation, July 1976.
23. Copy of Energy, Mines and Resources Canada Newsletter, "The Conserver", Volume 1, No. 1.
24. Notice of book called "A New Look at Some Old Things", distributed by Bd. and Park Commissioners, Hamilton County Park District.
25. Notice of the magazine called "Alternatives".
26. Information on the proposed expansion of skiing facilities at Sunshine Village, Banff National Park, distributed by Edmonton Chapter NPPAC.
27. Notice of the 7th Convention of the Concile international des économies régionales, Sherbrooke, Québec 1976.



OBITUARY

GORDON ANDREW HOBBS 1916 - 1977

Gordon Hobbs died on March 23, 1977, after a prolonged illness. He is survived by his wife, Betty, and three children.

He was born in 1916 and raised in Ontario and received his undergraduate training at the Ontario Agricultural College. After service as an officer in an antitank regiment during World War II, he came to work on forage crop insects at the Field Crop Insect Laboratory, which later became part of the Agriculture Canada Research Station, Lethbridge.

He obtained his M.Sc. from Utah State College in 1948 and his Ph.D. from Oregon State University in 1952.

For many years Gordon was responsible for research on forage pests but later he began to concentrate solely on forage crop pollinators. After demonstrating that honey bees were of no value in pollinating alfalfa in western Canada, he devoted his attention to leafcutter and bumble bees.

His observations of 19 species of bumble bees representing seven of the nine genera found in North America corrected a large amount of misinformation that had existed in the literature and provided a great deal of new information on behavior and phylogenetic relationships of Bombidae.

In 1962, he imported the alfalfa leafcutter bee into southern Alberta, and his tests immediately showed the great potential of this species. Within three years, he published a bulletin "Importing and managing the alfalfa leafcutter bee". Revised many times in subsequent years, this bulletin became a "best-seller". He published well over 30 scientific papers as well as many popular articles, and made several movie records of his work.

From 1962 until his retirement in 1975, Gordon made a great many improvements on the management of the alfalfa leafcutter bees. His research received world-wide recognition, and requests for information and for his bees were received from Europe, South America, and Asia, as well as from locations across North America. An alfalfa seed industry developed in western Canada as a direct result of his efforts, and the production of seed and leafcutter bees became a multimillion dollar industry. His research work received recognition by the Research Branch of Agriculture Canada through a special merit award in 1968.

Upon his retirement in 1975, Gordon devoted his time to the commercial production of the alfalfa leafcutter bee. In 1976, he was awarded an honorary membership in the Entomological Society of Alberta and a similar honor in the Entomological Society of Canada was being proposed at the time of his death.

During his career, Gordon contributed to science through his basic studies of insect behavior, his development of practical methods of managing the leafcutter bee, and his transmission of his knowledge to the growers. The combination of these aspects of his career earned Gordon Hobbs a position among the top entomologists in Canada.

LIST OF MEMBERS

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