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Editor W. A. Charnetski

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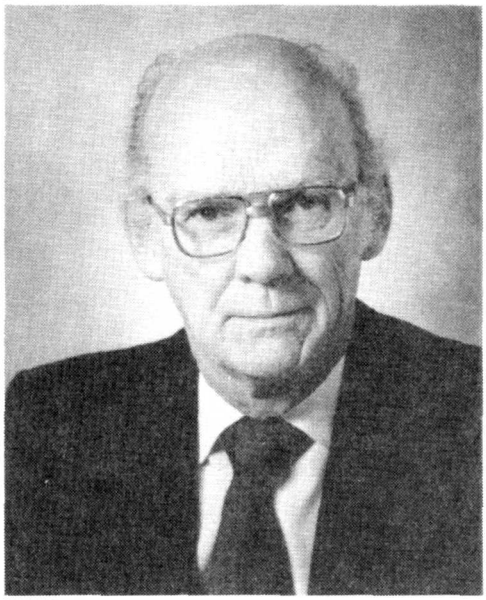

HONORARY MEMBER

OF

WILLIAM (Bill) ARNOLD NELSON

Bill Nelson is a native of Lethbridge, where he received his early education. He attended the University of Alberta, obtaining his B.Sc. degree in Chemistry and Biological Sciences in 1944. Bill continued his training at McGill University, where he received his M.Sc. and Ph.D. degrees in 1948 and 1957, respectively.

Bill joined the Experimental Farms Service of the Canadian Department of Agriculture in 1941 as a summer student, and served in this capacity for two summers. Through 1943 to 1947, Bill was an Agricultural Assistant with the Entomological Laboratory, working on a project on wheat stem sawfly resistance in wheat. In 1948, he transferred to the Livestock Insects Laboratory, under the direction of the late R. H. Painter, as an Agricultural Scientist to conduct research on pests of sheep and other livestock. Even though Bill's place of work changed from the Livestock Insects Laboratory to the Veterinary-Medical Entomology Section of the Science Service Laboratory, to the Animal Parasitology Section of the Research Station, his emphasis did not change. Bill's research on the host-parasite relationship in livestock pests has been widely recognized and the results have been published in 30 scientific papers and 59 other publications. In his research he has established that resistance to keds by sheep was characterized by cutaneous vasoconstriction in skin that cut off the blood supply sufficiently that the parasites were not able to obtain blood. He also proved this to be true for cattle lice. Bill is a co-author of an internationally recognized review of literature on host-parasite relationships.

Bill is an active member of the Entomological Society of Alberta, and before retirement, he was an active member of the American Society of Parasitologists and the Professional Institute of the Public Service of Canada. For a while he was a member of the Entomological Society of Canada and the Agricultural Institute of Canada. Bill served as Associate Editor of the Journal of Medical Entomology. Bill served in various capacities on Research Station Committees.

Bill is a very active member in the Lethbridge Symphony Association and St. Augustine's Anglican Church. He is a recognized amateur photographer. Bill and his wife, Margaret, have three children - Murray, Mark, and Katherine. Bill and Margaret reside in Lethbridge.

Bill has been a very active member of the Entomological Society of Alberta. He is a charter member of the Society. He has served as President, Vice President, Treasurer, Secretary, Editor, and Director of the Society. Bill has been the photographer at the annual meetings for the last five years, theresults of his efforts are ever present in our proceedings. Bill presented informative papers at 17 annual meetings of the Society.

It is with great pleasure we, the undersigned, nominate William (Bill) Arnold Nelson as Honorary Member of the Entomological Society of Alberta.

J. A. Shemanchuk
J. Weintraub
W. B. Barr
W. A. Charnetski
J. L. Shipp

Dated 19 September 1984

PRESIDENT'S REPORT
Entomological Society of Alberta

During my opening address at your annual meeting in Calgary this year, I reported that our total membership had become very static during the last 10 years. It seems this statement was somewhat precipitous, because before the end of the meeting fourteen more new names had been added to our membership list. A sincere welcome to all of you, and I hope that you will have a long and active association with this Society.

I noted also that our female membership had increased from 7% to 17% of the whole, but there had been only two lady Vice Presidents in the thirty-two years of the Society's existence. I trust whatever contributions I have been able to make, will encourage other ladies to take an active role in the Society, without the need of an affirmative action program!

Another concern has been that the Society is made up almost entirely of professional entomologists, and despite the frequently recurring theme at annual meetings of how we can encourage amateur entomologists, nothing very concrete has come out of our efforts. With the current emphasis on presentation of research papers, the gap is perhaps rather difficult to bridge. Dr. Robert Holmberg has done a commendable job of compiling a form for our members to fill out, where we as individuals can offer our teaching services to young people and the general public through the Alberta Teachers Association. This is a start in the right direction. Amateur entomologists have made significant contributions in other Provinces and countries where they have been active, so I hope we will give this some serious consideration.

During this year we have tidied up our list of standing committees, and will in future detail names of members in The Proceedings so that there is less confusion about who is a member of what committee and for what term. Our financial status is very healthy, and under Dr. Holmberg's capable direction it can only improve I'm sure.

Our membership is pleased to add another honorary member, Dr. William Nelson, who has been an active member for many years, and who ably fulfils the role of official photographer at our annual gatherings.

Finally, I would like to say that, despite some initial trepidation, I have enjoyed my year as President of this Society, and wish all the very best to Jim Drouin and the rest of the incoming executive.

Marilyn Y. Steiner
President
Entomological Society of Alberta

TRANSMISSION OF VERTICILLIUM WILT BY INSECT FECAL PELLETS

H. C. Huang and A. M. Harper
Agriculture Canada Research Station, Lethbridge, AB

Alfalfa leaves infected with Verticillium albo-atrum were fed to leaf chewing insects: grasshoppers Melanoplus sanguinipes (Fabricus) and M. bivittatus (Soy), alfalfa weevil Hypera postica (Gyllenholl), and woolly bear Apantesis blakei Grote, to determine survival of the pathogen after passage through the digestive tracts. V. albo-atrum survived in the digestive tracts of all species and usually appeared in the feces one day after feeding. The percentages of V. albo-atrum-contaminated feces varied among individuals within species and was related to the duration of feeding on diseased tissue. V. albo-atrum could be eliminated from the digestive tracts of grasshoppers by changing the diet to uninfected alfalfa leaves.

When V. albo-atrum-contaminated feces from grasshoppers were buried near roots of alfalfa seedlings, 21% of the plants developed wilt symptoms after 6 weeks. Previous reports indicate that alfalfa pests and predators are effective agents for spreading spores of V. albo-atrum. This study demonstrates that the pathogen can also be transmitted by the feces of leaf chewing insects.

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CONTROL OF INSECT PESTS WITH THE FUNGUS VERTICILLIUM LECANII

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Agriculture Canada Research Station, Lethbridge, AB

An isolate of the fungus Verticillium lecanii (Zimmerman) Viegas from Mount Allen in Alberta significantly reduced populations of the aphids, Metopolophium dirhodum Walker, Acyrthosiphon pisium (Harris), Therioaphis maculata (Buckton), and Myzus persicae (Sulzer), the grasshopper Melanoplus sanguinipes (Fabricus), and the nobid Nabis alternatus Parshley.

The pathogen did not significantly reduce populations of the aphid Rhopalosiphon padi L., the adult of the coccinellid Hippodamia quinquesiguata Kirby, and the larva of the pyralid Ostrinia nubilalis (Hübner).

V. lecanii is affected by temperature and humidity and is most effective for controlling insects when humidity is high. As the mean rainfall in southern Alberta is about 407 mm per year and humidity is low, V. lecanii may be of limited value for control of pests on dryland crops. However, there are nearly 405,000 ha of irrigated land in southern Alberta where moisture can be controlled and humidity increased. By irrigation of fields and judicious application of suspensions of V. lecanii it may be possible to increase the effectiveness of V. lecanii on aphids and grasshoppers.

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ROOT MAGGOTS (*DELIA* SPP.) AS PESTS OF CANOLA IN ALBERTA

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and

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Province-wide surveys of damage to canola by root maggots indicated that crop infestations were higher in those areas of Alberta where the cooler temperatures and higher moisture conditions, which are conducive to maggot survival and development, prevailed. These conditions predominate in the Northwest and Peace River regions. In the Northwest, an average of 75% of the plants in a field were invaded in 1981, 34% in 1982, 64% in 1983. In the Peace River region the average in 1981, 15% in 1982, 25% in 1983. In the remaining regions combined, an average of 5% of the plants in a field were invaded in 1981, 13% in 1982, and 16% in 1983. Most of the roots invaded were scarred on the surface only. However, in 1981, 50% of damaged roots in Northwestern Alberta had tunnels penetrating at least halfway across their width, while in 1983, 30% of the roots of damaged plants in Northwestern Alberta were riddled in this manner. Plant mortality, due to severing of the root below the soil surface, was rare.

While the cabbage maggot, *Delia radicum* (L.), is the dominant pest of canola in the most heavily infested area Northwest of Edmonton, survey work during 1984 has shown that the turnip maggot, *D. floralis* (Fallen), becomes dominant in Northeastern Alberta and at Athabasca.

The biology of the cabbage maggot in Northern Alberta may be outlined as follows: Adults emerge from overwintering puparia from about May 15 to July 15 without a sharp peak. They locate new canola fields by odour and begin to oviposit when the crop bolts in mid- to late June. Larvae can be found from late June to about the end of July. They normally feed externally in the rootstock, producing deep furrows which extend more or less vertically. Damage accumulates through July, and badly damaged plants may rot and eventually break off just below ground level. During the second half of July larvae leave the roots to pupate in surrounding soil. Most puparia overwinter.

The predominant univoltinism of the cabbage maggot in Northern Alberta contrasts with its multivoltinism in other parts of Canada and elsewhere in the world. Two years' gathering of basic phenological data has been essential before consideration of pest management strategies, because of the inapplicability of previously published data to Northern Alberta.

Carabid and staphylinid beetles are important predators of the eggs and larvae of root maggots in Northern Alberta as elsewhere, though these are differences in the species composition of the fauna. The most abundant carabids trapped in canola fields at Morinville in 1984 were *Bembidion quadrimaculatum* Kerby, *Agonum placidum* Say, and *Amara quenseli* Schonherr.

The predatory staphylinid *Philonthus occidentalis* Horn was also abundant. The staphylinid *Aleochara bilineata* Gyllenhal, whose adults are predators of root maggot eggs and larvae and whose larvae are internal parasitoids of the puparia, was less common in canola fields than has been reported in garden crops.

The late Dr. Terry Swanson undertook fungal isolation from samples of 50 canola roots damaged by root maggots and 50 undamaged controls collected at weekly intervals through July. Preliminary results suggest that Rhizoctonia infection was mainly acquired in the seedling stage, but that Fusarium infection was entirely secondary following insect damage. Two-thirds of the maggot-damaged roots were infected with Fusarium, while clean controls were entirely unaffected. The few control roots which proved positive for Fusarium were pockmarked by larval flea beetles. Other, still unidentified, fungi were also secondary invaders of maggot-damaged roots. Complete data and identifications are expected by the end of the year.

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THE EUROPEAN CORNBORER IN ALBERTA

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and

N. B. Collard
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Although sporadic outbreaks of the European cornborer, Ostrinia nubilalis, Huebn. have occurred in Alberta since 1956, the insect did not become established until 1980. Since then it has spread westward and northward from its center of origin in Medicine Hat, and can now be found as far west as Purple Springs, and as far north as Brooks.

In alberta O. nubilalis is of the "one generation strain". It generally winters above ground in corn frass, as a mature fifth instar larva. However, some third and fourth instar larvae have been found in the early spring, indicating that this species is able to survive the winter in younger stages, under some conditions. Mature larvae are also able to winter successfully in corn trash buried 12 inches (30.5 cm) below the surface; subsequent tillage operations can expose such buried cornborer larvae, permitting them to complete development, and reducing the effectiveness of this cultural control measure.

So far, the European cornborer has been of concern primarily to sweet corn growers in Alberta. Although four insecticides are available for the control of the cornborer, control recommendations to date have favoured cultural methods, largely due to the relatively small acreages of sweet corn involved and the inexperience in handling insecticides on the part of many growers.

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DIFFERENCES IN POPULATIONS OF THE EUROPEAN CORN BORER (OSTRINIA NUBILALIS) IN SOUTHERN ALBERTA

D. Lee
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Differences in phonology, female fecundity, and pupal weights were observed between two populations of the European corn borer in southern Alberta. The date for 50% pupation for borers in the S. Saskatchewan River valley was June 21, while that for the borers on the plains 15 km south was June 28. Dates for 50% emergence were July 8 and July 14, respectively (1983 data). Transplanting valley borers to the plains and plains borers to the valley in March 1984 demonstrated that differences in phenology and pupal weights are mainly environmentally determined. Under controlled conditions valley females laid an average of 584.3 eggs each, while plains females laid only 284.6 eggs each. The partial correlation coefficient of fecundity with pupal weight was +42.2%. Weights of pupae dissected from corn stalks also showed significant differences between populations of the valley (mean wt. = 0.1001) and the plains (mean wt. = 0.0852). Thus, differences in fecundity between the two populations are related to differences in their pupal weights. Field sampling in 1984 demonstrated a significant increase in the larval weights (both wet weight and oven-dry weight) of valley borers between June 5-10. This did not occur in plains populations. Possibly valley larvae engage in a post-diapause feeding behaviour, while plains larvae do not.

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LIFE HISTORY AND DISTRIBUTION OF PETROVA METALLICA (LEPIDOPTERA: TORTRICIDAE) IN ALBERTA

J. A. Drouin and H. R. Wong
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The pitch-blister moths, Petrova albicapitana and P. metallica cause extensive damage in Alberta. The pitch nodules that results are similar in appearance as are the larvae, but can be separated by the type of feeding damage. Larvae of P. metallica feed by tunnelling down the pith, causing the shoot to swell. Larvae of P. albicapitana partially girdle and feed on bark and xylem. Pheromone trapping in 1981-84 indicate that P. metallica is more abundant, especially at elevations over 1000 m and has much wider distribution than previously recorded. P. metallica was not found at elevations below 1000 m while P. albicapitana was the only species found. As the elevation increased over 1000 m, P. albicapitana decrease to only a few found at the 1500 m elevations. Life history is similar, with a two-year life cycle, different feeding habits, and P. metallica does not migrate.

==========

OBSERVATIONS ON THE LIFE HISTORY AND HABITS OF NEMATUS CALAIS KIRBY (HYMENOPTERA: TENTHREDINIDAE) DEFOLIATING WILLOWS IN ALBERTA

H. R. Wong
Canadian Forestry Service, Northern Forest Research Centre, Edmonton, AB

Nematus calais Kirby caused moderate to severe defoliation to ornamental willows in the Edmonton area in 1976-78. A brief description of the life stages, damage, and life history and habits are presented. There are two generations a year, adults appearing in early June and mid-July to early August. Five or six larval instars were observed. The number of instars is not related to the sex of the individual.

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FLIGHT ABILITY OF REEMERGING EASTERN LARCH BEETLES, DENDROCTONUS SIMPLEX LECONTE (COLEOPTERA: SCOLYTIDAE), FOLLOWING EGG GALLERY FORMATION AND OVIPOSITION IN TAMARACK, LARIX LARCINA (DU ROI) K. KOCH, IN NEWFOUNDLAND

D. W. Langor
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Flight muscle changes during egg gallery formation and oviposition was investigated for field populations of Dendroctonus simplex in Newfoundland. Beetles in the flying state possessed large, fully developed flight muscles in their metathorax. Muscles completely degenerated within 10-12 days after start of egg gallery formation and mature gonads occupied most of the space in the metathorax. Flight muscles did not completely regenerate in all parent beetles before reemergence from first brood trees. Of 96 reemerged beetles, 16% had fully developed flight muscles and were judged capable of flight, 34% had small flight muscles, and 50% had no flight muscles. Therefore, most reemerging adults were not capable of flying to new hosts to produce a second brood. Reemerged beetles that were capable of flight may have been too few in number to overcome the resinosis response of ungirdled larch. No second broods were produced in ungirdled trees in 1983 or 1984. Lack of complete flight muscle regeneration may be a result of selection for a single brood per year in Newfoundland where climate is not conducive to production of a second brood.

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PROOFING MOSQUITOES: MARKING AND RECAPTURING

P. J. Scholefield
Pesticide Chemicals Branch, Alberta Environment, Calgary, AB

Emerging adult mosquitoes were marked with Dayglo (Reg. Trade Name), a fluorescent powder, and then released. Recapture of these marked adults in the village of Tilley was facilitated by use of New Jersey light traps. Presence or absence of tagged adults in light trap collections would suggest which mosquito larval habitats were the source of mosquito annoyancy. In this present trial it was found that a large swampy area to the N.W. of Tilley was a problem, because marked adults from this site were being recaptured in the village. In addition, they were also found in light trap collections taken in Brooks, 21 km away to the N.W.

It is evident from this preliminary mark-recapture trial that this system of tracking adult mosquitoes has great utility. One example is that it could be used in mosquito control programs to determine whether a particular larval habitat warrants chemical control and to what degree. The great distance travelled by some of the tagged adults further substantiates the fact that mosquito problems can have their origin some distance away.

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B.T.H-14 FORMULATION STUDIES FOR MOSQUITO CONTROL IN ALBERTA

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As an alternative to current organophosphate dependency in mosquito control programs in Alberta, formulations of B.t.H-14 present a promising potential. Registered formulations, of which granules are preferred, are monitored both at and below label recommended rates and varying external conditions. Using screened bioassay larval holding cages and the standard dipping technique in artificial and natural ponds, mosquito larvae were monitored up to 14 days after B.t.H-14 treatment. Over 1983 and 1984 field seasons tests of this nature indicate that 95% success rates within 24 to 48 hours after treatment, of both granular and liquid B.t.H-14 formulations, coincide directly with weather conditions that produce water temperatures in excess of 15°C. In southern Alberta, this temperature factor affecting larval metabolic and feeding rates contributes significantly to the success or failure of the product. Because of this affect, the successful use of B.t.H-14 in cooler spring water conditions will be in question until its action at lower temperatures is studied further.

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COMPARATIVE LIFE-HISTORY CHARACTERISTICS IN THREE POPULATIONS OF A COMMUNAL ORB-WEAVING SPIDER

M. J. Benton
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Size and fecundity in three populations of the communal orb-weaving spider, Metepeira spinipes, were examined. M. spinipes exhibits increasing colony size and encounters increasing potential prey density over a desert to rain forest clinal gradient in central and south central Mexico.

There was no difference in adult size or fecundity between the desert and rain forest populations, but both parameters were significantly greater in the intermediate population. The following explanations are postulated for these results:

1) A more optimal developmental temperature regime may exist in the intermediate habitat which maximizes adult size and fecundity while warmer than optimal mean and extreme temperatures in the desert and rain forest negatively affect these values.
2) Food may be more limiting in the desert and rain forest. The desert is simply low in potential prey, while the rain forest may be low in effective prey availability per individual due to high spider density, smaller individual web sizes, and web colony avoidance by potential prey.
3) In spite of the high fecundity in the intermediate population, large colony size is prohibited by winter effects which coincide with the annual die-off of the adults, and by the relative shortage of favourable web sites which may negatively affect juvenile survival. This relatively lower adult population size, however, may in turn result in higher prey availability per individual and, along with developmental temperature regime, promote the observed larger body size and higher fecundity.

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BUMBLE BEE CHROMOSOME NUMBERS: IMPLICATIONS FOR TAXONOMY AND THE EVOLUTION OF SOCIALITY

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Chromosome counts are available for 16 Bombus Latr. species (the social bumble bees) belonging to five subgenera and for one Psithyrus Lep. species (the social parasitic bumble bees). In Bombus the haploid numbers are consistent within each subgenus but there is variation between subgenera; the subgenera Bombus s.s. and Pyrobombus have n=18, while Separatobombus and Cullumanobombus have n=19, and Fervidobombus has n=20. Thus, considerable morphological divergence between subgenera is often, but not always, paralleled by divergence in chromosome number. The finding that Psithyrus ashtoni has an n=25 provides support for the monophyletic origin of Psithyrus, but the high value of n is not expected if eusociality selects for increase in chromosome number.

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REPRODUCTIVE BEHAVIOUR OF THREE NOVA SCOTIAN BROAD-WINGED DAMSELFLIES (ODONATA: CALOPTERYGIDAE)

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and

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A comparative study of the three Nova Scotian Calopterygid damselflies, Calopteryx maculata, C. aequabilis, and C. amata was carried out in the summers of 1983 and 1984. All three species displayed similar complex mating behaviour. The possibility of sperm replacement may explain the elaborate territoriality and post-copulatory guarding behaviour of C. maculata and C. aequabilis. In C. amata there appears to be a reduction in territoriality and guarding behaviour which may be the result of differences in habitat between the three sites where each of the three species was studied. C. amata displayed longer mean courtship and copulation times, as well as a higher incidence of forced copulation attempts.

Observations of all three species suggest that females are pursuing a complex mating and oviposition strategy of their own. Testable hypotheses regarding this behaviour may be made if it is assumed that females are acting to maximize their own fitness rather than merely accepting benefits of male action.

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MORTALITY FACTORS AND REGULATION OF POND-SKATER POPULATIONS

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Impacts of potential density-dependent mortality factors on population growth of Gerris buenoi Kirkaldy were studied experimentally in field exclosures. Effects of predation by freshwater invertebrates and food limitation were considered in a 2x2 factorial experiment, using food supplements and elimination of predators by screening as experimental treatments. Control exclosures were run under ambient conditions of food availability and predation. Presence of invertebrate predators decreased survivorship 2-3 fold. The main predators noted in this study were fishing spiders (Dolomedes), backswimmers (Notonecta), larvae of predaceous diving beetles (Ascillius, Dytiscus), and dragonfly naiads (Aeshna). Food supplements, at 50-200% (by weight) of average background surface fall of potential food items, did not significantly affect survivorship of gerrids to the adult stage. However, food additions were associated with significant increases in whole body dry mass of teneral adults. This effect was greater for females than for males, suggesting that female fitness may be more effected by variation in body size than is that of males. Absence of predators was associated with smaller body size among teneral adults of G. buenoi. This confusing observation suggests that the experimental manipulation of screening out aquatic predators can have a significant impact on food available to semi-aquatic bugs.

Results of a second experiment about the significance of cannibalism under field conditions demonstrate that the Food Cache Hypothesis (Polis, G. A. 1982. Ann. Rev. Ecol. & Syst.) does not hold for G. buenoi in Alberta. In the experiment, performance of two groups of bugs was compared. The control group resulted from a single pulse of 100 eggs (cohort 1) added to 1.0 m^2 exclosures. The experimental group resulted from a similar first cohort plus 4 supplemental pulses of 50 eggs each at weekly intervals. Survivorship and dry mass of teneral males from the first cohort did not differ between groups with and without access to early stages as potential prey. Mass of females from cohort 1 was significantly less from the experimental group, suggesting that interstage resource competition was more important than cannibalism over the natural range of density used in this experiment.

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BIOGEOGRAPHY AND ECOLOGY OF SAND DUNE TIGER BEETLES IN ALBERTA AND SASKATCHEWAN

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The following hypotheses are proposed to explain the distribution and geographic variation of sand dune dwelling tiger beetles of the genus Cicindela (Coleoptera: Carabidae) in Alberta and Saskatchewan. During periods of cool, moist climates, when many small dune fields become overgrown with plants, tiger beetle ranges may be restricted to a few very large dune fields, which thus act as refugia. Isolated populations in southern dune fields show increased area of light elytral markings, while northern populations show dark ground colour and/or thinner light markings. Cicindela formosa gibsoni Brown is more-or-less endemic to the Great Sand Hills of Saskatchewan, while a distinctive, darker coloured population of C. hirticollis Say is endemic to the Lake Athabasca dunes. These forms may have evolved in situ. C. limbata Say has a northern and a southern subspecies in Canada, and these taxa may have evolved in these two dune fields as well. The two subspecies presently occupy both natural and man-made habitat throughout the prairies, and intergrade in central Saskatchewan. C. tranquebarrica Herbst and C. lengi W. Horn exhibit darker colour in more northern areas, but the former species is a habitat generalist, and the latter is unknown from the Lake Athabasca area, so this area can not be postulated as a refugium for them. These hypotheses can, in the forseeable future, be tested by the prediction that increase in dune area will result in wider geographic ranges and greater intergradation between subspecies, while decrease in dune habitat will have the opposite effect.

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THE CHIRONOMIDAE (DIPTERA) COMMUNITIES OF THE DELTA MARSH, MANITOBA

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The Chironomidae (Diptera) are reported to be one of the most abundant and diverse groups of aquatic insects found in marsh habitats. However, very little information is available on this group in wetlands. In the Delta Marsh, in south-central Manitoba, four separate investigators have sampled aquatic insect emergence. The Chironomidae from these collections have been sorted, identified, and enumerated. Six habitats within the marsh, situated along a gradient, from the dry uplands to the deep-water bays, were sampled. These habitats were: Phragmites australis (Cav.) Trin. ex Steudel, Scolochloa festucacea (Willd.) Link (whitetop), Typha glauca Godr. (cattail), Scirpus acutus Muhl. (hardstem bulrush), shallow water with Potamogeton pectinatus L. (pondweed), and deep-water bays with scattered submersed vegetation.

Species determinations have not been completed, but well over 100 species of chironomids have been identified from the Delta Marsh. Highest emergent densities (15,450/m^2/yr) were found in shallow water with dense submersed vegetation. The subfamily, Orthocladiinae, dominated emergence at the terrestrial end of the gradient and the Chironominae dominated in the deeper waters. Tanypodinae were most abundant in shallow water with dense submersed vegetation. The two most abundant species in each habitat were: Phragmites - Pseudosmittia sp., Limnophyes n. sp.; whitetop - Chironomus nr. atroviridis (Townes), Limnophyes n. sp.; cattail - Cricotopus sylvestris (Fabr.), Limnophyes n. sp.; bulrush - Paratanytarsus sp. 1, Limnophyes n. sp.; shallow water with pondweed - Tanypus punctipennis Meigen, Cricotopus sylvestris; and deep water bays - Chironomus spp.

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EREBIA MAGDALENA (LEPIDOPTERA: SATYRIDAE) IN ALBERTA, NATURAL HISTORY AND BIOGEOGRAPHY

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Erebia magdalena Strecker was discovered in 1981 on a front range mountain in Alberta. Eggs obtained from captive females were allowed to hatch, and larvae were reared. Comparisions with adults of E. magdalena from the U.S. and E. mackinleyensis Gunder from the Yukon suggest that the Albertan population descended from populations which dispersed north from a southern refugia following deglaciation.

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STRUCTURE AND DEVELOPMENT OF LARVAL ANTENNAL SENSILLA IN EMBRYOS OF LYTTA VIRIDANA (COLEOPTERA: MELOIDAE)

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

At hatching (252-264 h at 25 ± 0.5°C), each larval antenna has 3 flagellomeres and bears 30 sensilla of 7 different types. The antennae first appear at 48 h as paired evaginations of body wall epidermis on either side of and slightly behind the stomodaeum. Sensillar stem cells originate in their walls by 64 h and these proliferate until about 120 h by which time most of their progeny have begun to differentiate into groups of sensory neurons and accessory support cells.

Following revolution (Katatrepsis) at ± 120 h, the sensory dendrite of each neuron grows towards the surface of the epidermis and contacts the inner side of embryonic cuticle 2 when this begins to be deposited at 120 h. With apolysis of this cuticle at 132 h, both dendrites and the apices of the thecogen cells which surround them, elongate, the latter depositing a dendritic sheath about each group of denrites that is continuous with this cuticle. Between 112 and 144 h, trichogen cells grow out to form the definitive sensilla and larval cuticle begins to be secreted about these after 156 h. Dendritic contact with embryonic cuticle 2 is maintained until shortly before hatch through pores in the apical or basal cuticle of the larval sensilla. Basal bodies and ciliary rootlets of the dendrites first appear at about 120 h while scolopales of the Johnston's Organ scolopidia are secreted between 120 and 168 h. Differentiation of sensilla is essentially complete by 192 h except for further growth and differentiation of tormogen cells and dendrites, processes which continue until after hatch.

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PARTICLE CAPTURE MECHANISMS AND FLUID MECHANICAL ASPECTS OF SUSPENSION FEEDING IN AQUATIC INSECTS

S. A. Braimah and D. A. Craig
Department of Entomology, University of Alberta, Edmonton, AB

Nymphs of Isonychia campestris McDunnough and larvae of Simulium bivittatum Malloch, fed mixtures of six size classes of polystyrene particles captured particles that were smaller than the pore spaces between filtering structures more efficiently than was expected, if filters functioned only as mechanical sieves. Capture efficiency was highest for the smallest (i.e. 0.5-5.7 m) particles.

It is shown that direct interception and diffusive and/or motile-particle deposition are mechanisms by which smaller particles reach filter surface. The latter mechanism is a better predictor of size distribution of such particles which were caught and consumed by both insects. Adhesion of particles is probably by electrostatic attraction/surface chemical effects.

Fluid mechanical aspects of the study indicate that filter-feeding in immatures of both insects is characterized by low Reynolds number (Re). Gradients of velocity in the boundary layer around rays of scaled-up models of portions of filters, towed through Canola oil, revealed that capture of small particles occurs in the viscous boundary layer closest to the ray. Adhesion of such small particles is enhanced by their neutral bouyancy which increases the transit time in the filters.

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PRELIMINARY ANALYSIS OF THE GENETIC BASIS OF STERILITY IN HYBRIDS OF GLOSSINA MORSITANS MORSITANS AND GLOSSINA MORSITANS CENTRALIS (DIPTERA: GLOSSINIDAE)

R. H. Gooding
Department of Entomology, University of Alberta, Edmonton, AB

Female Glossina morsitans morsitans, marked at 3 loci on the X chromosome and at one or two loci on each autosome, were mated with Glossina morsitans centralis who were marked at the same loci. The F_1 females were backcrossed to G. m. centralis and their male progeny were tested for their ability to fertilize females from each parental line. The origin of the chromosomes in the hybrid males was determined by electrophoresis and by scoring of visible traits. None of the males were able to fertilize G. m. centralis. About half the males having an X chromosome and a Y chromosome from G. m. centralis fertilized G. m. morsitans, but almost none of the males having an X chromosome from G. m. morsitans and a Y chromosome from G. m. centralis fertilized either G. m. morsitans or G. m. centrallis. Within some genotypes both sterile and fertile males were found. The results indicate that fertility in backcross hybrid males is influenced by maternally inherited factors, by compatibility of X and Y chromosomes, and by one or more loci on the autosomes. In hybrid females no evidence was found for genetical recombination between the loci ocra and Apk on the X chromosome, but free recombination occurred between the loci Ao and Xo in linkage group II. On the basis of the results obtained, it is proposed that an inbred line of hybrid flies could be established and used for genetic control of the subspecies which provided males for the establishment of the hybrid line.

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A COMPARISON OF PROTEOLYTIC ENZYMES FROM ADULTS AND LARVAE OF TSE-TSE FLIES, GLOSSINA SPP.

M. T. Cheeseman
Department of Entomology, University of Alberta, Edmonton, AB

1) Proteolytic enzymes from adult Glossina morsitans morsitans, G. m. centralis, G. m. submorsitans, G. p. gambiensis and larvae of G. m. morsitans were separated using DEAE-cellulose chromatography and Sephadex gel-filtration and characterized by their ability to hydrolyse casein and/or synthetic substrates.

2) Adults of G. morsitans subspecies have seven proteolytic enzymes; trypsin, carboxypeptidase A, carboxypeptidase B, a chymotrypsin-like enzyme PVII, a trypsin-like enzyme PVI and two aminopeptidases.

3) An additional trypsin-like enzyme, designated proteinase VIII, was found in adult G. p. gambiensis.

4) Homologous enzymes from adults of all taxa are qualitatively similar.

5) Neither PVI nor PVII found in adult G. m. morsitans were detected in larvae.

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POSSIBLE MECHANISMS OF FEEDING DETERRENCE IN PHYTOPHAGOUS INSECTS

B. K. Mitchell
Department of Entomology, University of Alberta, Edmonton, AB

In recent years, there has been a substantial increase in studies on chemical regulation of feeding in phytophagous insects. It is becoming clear that chemical compounds in plants can influence insects via sensory and metabolic routes. The concept of feeding deterrents is part of this increased interest and studies in this area are designed to further understand insect/plant relationships as well as to uncover possible ways deterrents could be used in insect control. Most studies in this area make assumptions concerning the mode of action of feeding deterrents. The assumptions are largely untested.

We have undertaken a study of various alkaloids and are investigating their effect on chemosensilla of chrysomelid beetles. When feeding deterrents act via the chemosensory system, they could do so in a number of ways. These are discussed by Schoonhoven (1982) and by Mitchell and Sutcliffe (1984). In this paper we demonstrate that, as a group, alkaloids do act on sensilla in all of the ways suggested. The electrophysiological data are correlated with behavioural data to determine which, if any, of these mechanisms is the most effective.

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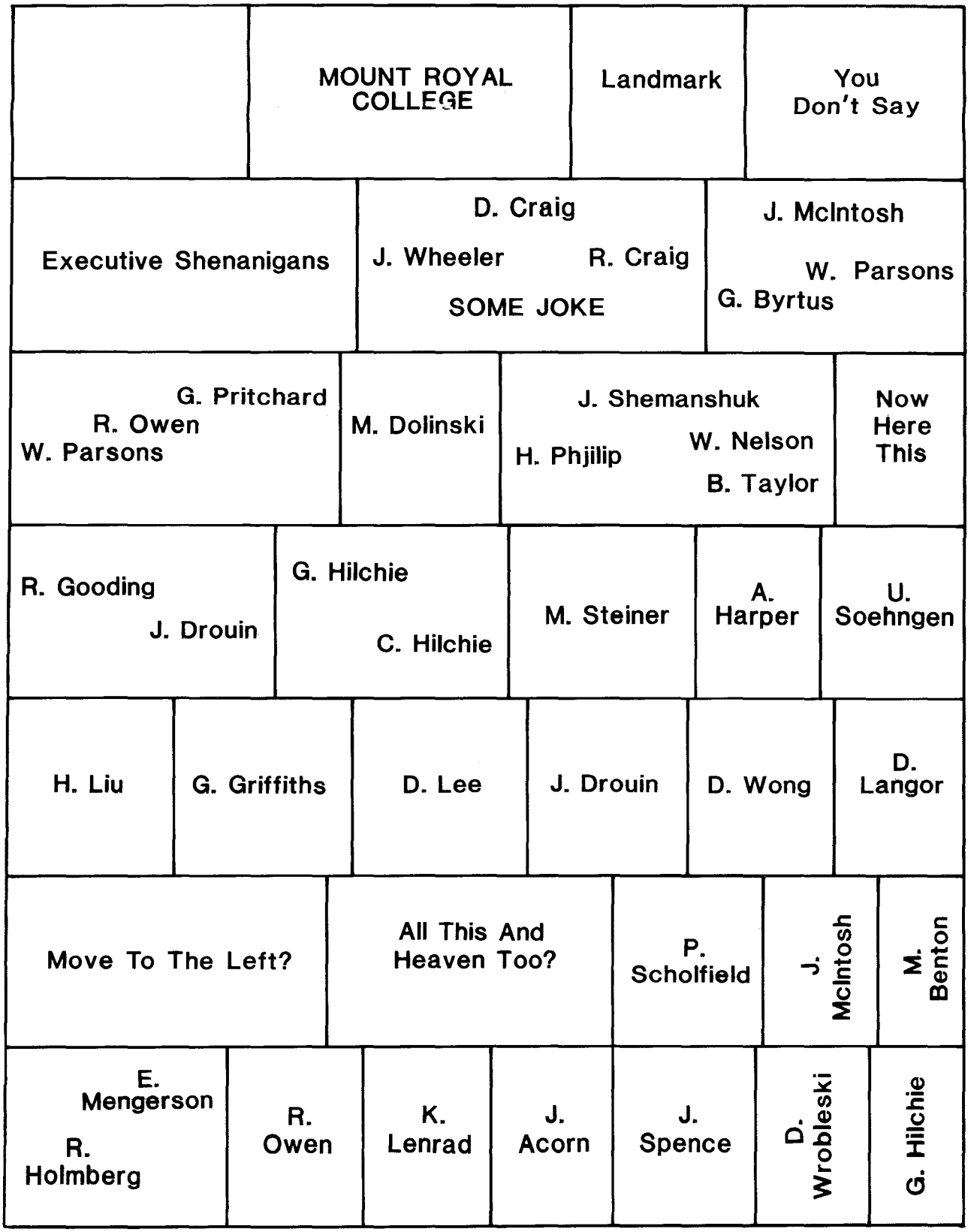
Photographic Highlights



ENTOMOLOGICAL SOCIETY OF ALBERTA

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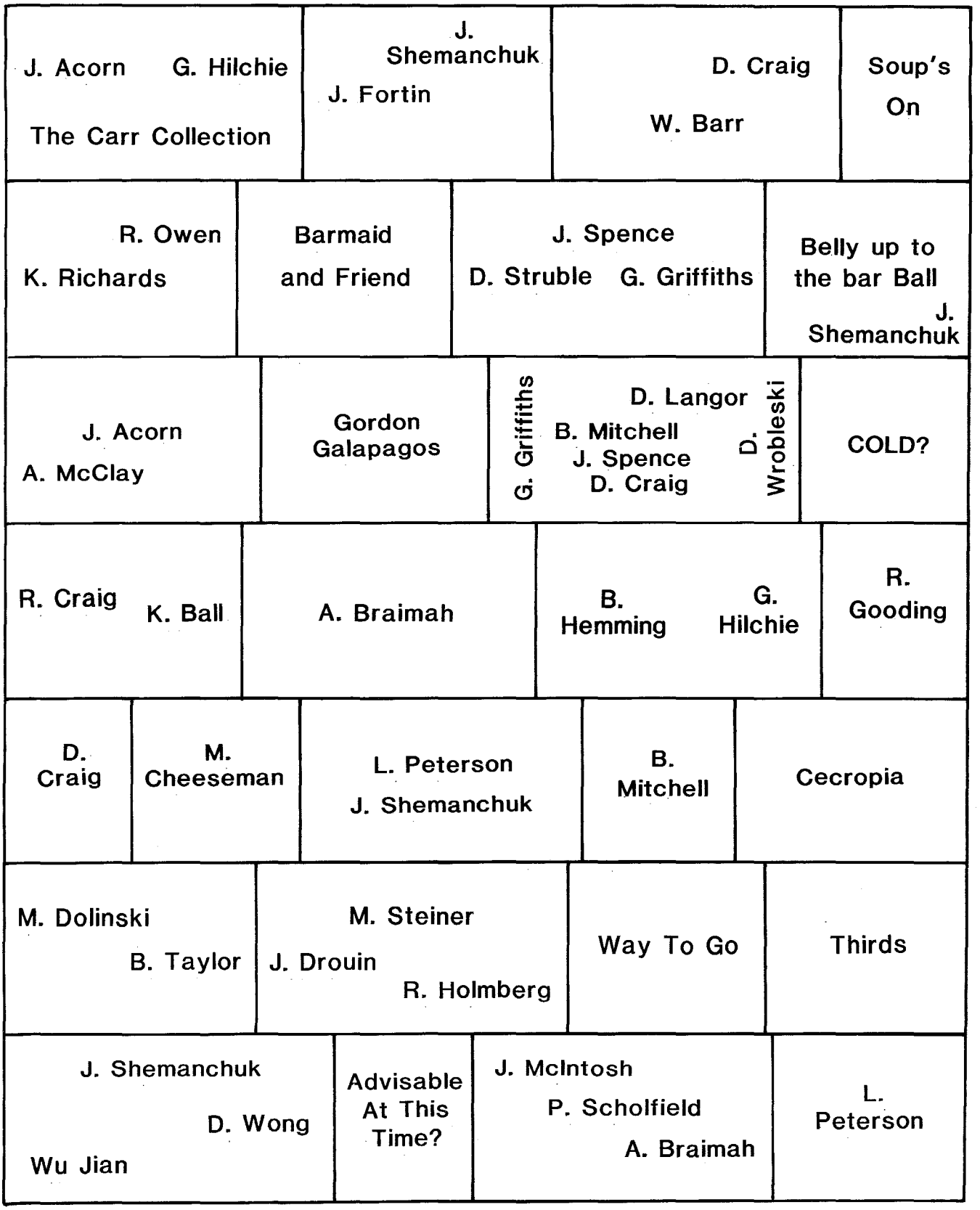

32nd ANNUAL MEETING–CALGARY 1984

32nd ANNUAL MEETING - CALGARY 1984

ENTOMOLOGICAL SOCIETY OF ALBERTA
Executive Meeting
April 14, 1984
Provincial Building, Olds, Alberta

Present: Bill Charnetski, Doug Craig, Jim Drouin, Colin Hergert, Robert Holmberg, Bill Nelson, Jim Ryan, Marilyn Steiner (Chair)

Absent: Bruce Taylor

1.0 Adoption of Minutes

MOTION: To adopt the minutes of the executive meeting as corrected.

Charnetski - Craig CARRIED

(Note: Minutes to be distributed with 1983 Proceedings.)

2.0 Business Arising From Minutes

2.1 Possible instruction of Alberta teachers in entomology

- Steiner to write letter to Minister of Education to ask about what is in present elementary and high school curricula concerning insects and spiders

- When information is obtained, we may proceed to form lists of speakers and resource people who could be contacted for help by individual or groups of teachers

2.2 Hosting of XVIII International Congress of Entomology in 1988

- In the General Meeting it was agreed that the Entomological Society of Alberta offer to host the next International Congress

- Steiner to contact the Entomological Society of Canada about this issue

3.0 Financial Report

MOTION: To receive the financial report for information

Craig - Ryan CARRIED

- Assets are to be placed in various short-term depostis

- Holmberg to contact Betty Andrews of the Entomology Department at the University of Alberta about proceeds from sale of insect collection equipment

- Craig to determine how much such equipment is left in stock and when we should re-stock

4.0 Editor's Report

- The Proceedings are about ready for duplication
- Charnetski to obtain exact page count, number of copies to be prepared, and necessary art work to prepare cover
- Holmberg to obtain price quotes on costs of duplication and binding by Athabasca University
- In order to reduce costs, it was generally agreed that the By-Laws and Rules and Regulations be reduced in size and only published on alternative years
- It was also generally agreed that the cost of membership in the Society cover, at least, the cost of the Proceedings
- When the 1983 Proceedings are distributed, a letter is to be included that will: ask for membership payment, give dates and place for the 1984 annual meeting, and recommend that members return unwanted back issues of the Proceedings to the University of Alberta

5.0 Secretary's Report

- Executive members were informed about various minor pieces of correspondence
- A membership report could not be presented because not all records have yet been received from the previous secretary
- Charnetski to send Holmberg a photocopy of the membership mailing list he has as well as one set of mailing labels for the Proceedings
- Craig to send supply of Society letterhead paper and envelopes to Holmberg and Hergert

6.0 Insect Collection Competition - 1983 (Hergert)

- 31 collections by students of Olds College
- Judging by Ernest Mengersen, Buck Godwin, and Colin Hergert
- 1st, Debbie Reich; 2nd, Lori David; 3rd, Chuck Leacock (to receive cheques of $40, $30, and $20, respectively)
- Honorable mentions: Janet Schega, Derrick Whyte, and Tammy Young
- Hergert to supply letters of congratulations to all winners; Holmberg to send out letters with cheques to E. Mengersen for distribution
- Hergert to investigate feasibility of having display collections shown in future meetings
- Judging sheet attached

7.0 Report of Regional Director to Entomological Society of Canada (Craig)

- Glen Wiley is stepping down as secretary and Joe Shemanchuk will be taking his place

- Preliminary report on Gold Medal and Gordon Hewitt awards

- Possibility of a combined meeting of the Entomological Society of Canada and the Biological Council of Canada meeting in London, Ontario, in July 1985 with a "regular" meeting of the E.S.C. in Ottawa in the fall

- Possibility that Vancouver may be the next site of the International Congress of Entomology

8.0 Report on Environmental Council of Alberta

- No report as no meetings since annual meeting

9.0 Annual Meeting 1984

- Dates are probably 25-27 October or 1-3 November

- Place is either Calgary or Lake Louise

- Hergert to obtain volunteers for scientific program, social program, registration, guest speaker, wine and cheese, banquet, etc.

- Bill Nelson to continue as photographer

- Discussion on how to encourage amateur attendance at the annual meeting

10.0 Other Business

- Craig to inquire about the status of the Society's archives at the University of Alberta and the possibility of having some restoration work done on additional photographs

Next meeting - at call of President

ENTOMOLOGICAL SOCIETY OF ALBERTA
Executive Meeting
August 11, 1984
Provincial Building, Olds, Alberta

Present: Doug Craig, Colin Hergert, Robert Holmberg, Jim Ryan, Marilyn Steiner (Chair), Bruce Taylor

Absent: Bill Charnetski, Jim Drouin, Bill Nelson

1.0 Adoption of Minutes

MOTION: To adopt the minutes of the executive meeting of 14 April 1984.

Holmberg - Hergert CARRIED

2.0 Business Arising From Minutes

2.1 Informing Teachers About Entomology

- See attached letter to Honourable D. King (Minister of Education) from M. Steiner and reply to M. Steiner from G. Popowich (Associate Director of Curriculum).

- R. Holmberg plans to attend Annual Conference of Science Council of Alberta Teachers' Association (29-30 September, Red Deer; see attached) to learn more about what teachers would like to teach about insects.

- R. Holmberg to prepare a form for the annual meeting to see how many members may wish to instruct teachers or their students in entomology.

2.2 1988 International Congress of Entomology

- Doug Craig has indicated that the Entomological Society of Canada will propose Vancouver as the location for the Congress.

2.3 Insect Collection Competition

- Letters and cheques have been sent off to the 1983 winners; the cheques have not yet been cashed.

- C. Hergert to contact E. Mengerson about having the 1983 winning collections at the 1984 annual meeting and estimated entries for 1984.

3.0 Financial Report (see attached)

- A request for $200 was sent to the Entomological Society of Canada and received.

- At the end of the last national meeting held in Alberta a bank account and a small amount of cash were accidentally overlooked during the

transition of the old and new executive officers; these items are indicated in the present statement.

- Subtracting liabilities, the Society has now about $8,000 on deposit.

- As the Society is in a healthy financial situation, R. Holmberg suggested that now may be the time to further the aims of the Society; suggestions included: 1) donation to the Entomological Society of Canada scholarship fund, 2) increase in amounts of Alberta scholarshps, 3) increase general awareness and knowledge about entomology in the public school system, and 4) printing photographs from negatives in Society's archives.

- D. Craig will discuss with the Department of Entomology at the University of Alberta about the Society receiving the money recouped from the sale of insect boxes and a procedure by which the Department can reimburse the Society for these sales without a great deal of paper work; there are several years supply of insect boxes on hand.

4.0 Proceedings

- 200 copies of the Proceedings will be printed by Media Services of Athabasca University for $600.

- R. Holmberg to check on ways to reduce distribution costs.

- D. Craig to check back issues of proceedings to see if it is necessay to request unused back issues from general membership.

- It was agreed that the Society would pay for binding several copies of the last 10 years issues of the Proceedings (total estimated cost $80-$100).

5.0 Annual Meeting (C. Hergert)

- Date: Thursday, 1 November to Saturday, 3 November

- Location: Mount Royal College

- Cost: Break-even budget includes $10 for registration and $15 for the banquet; $140 to rent meeting room.

- Accommodation: J. Ryan to suggest three motels in "Motel Village" in northwest Calgary.

- Pre-registration and call for papers to go out by mid-August (R. Holmberg); deadline for submissions, 1 October.

- Preliminary program and further details to be distributed by C. Hergert by end of first week of October; R. Holmberg to supply labels.

- R. Holmberg to advance C. Hergert a cheque for $200.00 for banquet and related costs.

6.0 Membership Report (see attached)

- Presently we have sufficient membership to warrant a fifth honorary membership; B. Charnetski and B. Taylor are hereby reminded to submit possible names and supporting documents to M. Steiner by 1 October.

7.0 Secretary's Report

- Due to relocation of R. Holmberg, an updated executive list is attached.

- M. Steiner and R. Holmberg to prepare a list of Society committees, their membership and expiry dates of the committee members of the national and provincial societies.

- No scholarship was recommended by the University of Alberta this year.

- Updates for subscribers to the Proceedings and various information requests about the Society are being prepared.

8.0 Report of Regional Director to Entomological Society of Canada

- D. Craig will attend national meeting in St. Andrews to exchange information between the national and provincial societies.

MOTION: That the Entomological Society of Alberta subsidize the accommodation and lodging expenses of the Regional Director at the national meeting.

Taylor - Ryan CARRIED

9.0 Archives (D. Craig)

- The Department of Entomology has agreed to store negatives and non-bulky items that have accumulated at the Research Station in Lethbridge.

- D. Craig to check if the Provincial Archives will store the photographs of the Society's archives.

10.0 Other Business

- Attached is an article on amateur botanists that may be applicable to entomology (R. Holmberg).

11.0 Next Executive Meeting

Time: 4:00 p.m., Thursday, 1 November
Place: Sun Bow Inn, Calgary

Adjournment: 1:00 p.m.

R. G. Holmberg
Secretary-Treasurer

ENTOMOLOGICAL SOCIETY OF ALBERTA
Executive Meeting
November 1, 1984
Sun Bow Inn, Calgary

Present: Doug Craig, Jim Drouin, Colin Hergert, Robert Holmberg, Bill Nelson, Jim Ryan, Joe Shemanchuk, Marilyn Steiner (Chair), Bruce Taylor

Absent: Bill Charnetski

1.0 Call to Order

- Meeting called to order at 4:00 p.m.

2.0 Adoption of Minutes

MOTION: That the minutes of the Executive Meeting of 11 August 1984 be adopted.

Craig - Hergert CARRIED

3.0 Business Arising From Minutes

3.1 Informing Teachers About Entomology

- R. Holmberg attended Annual Conference of Science Council of Alberta Teachers' Association in September in Red Deer and met with Brian Martin, President of the Science Council of the Alberta Teachers' Association.

- R. Holmberg prepared a questionnaire on the willingness of members of E.S.A. to give presentations on entomological topics which the executive approved to be given out at the annual meeting.

3.2 Aims of Society

- MOTION: That E.S.A. donate $500 to the E.S.C. scholarship fund.

Holmberg - Craig CARRIED

3.3 Insect Box Sales

- It was decided that the Department of Entomology should continue to sell these materials but that proceeds be asked for once a year, perhaps best in August.

- There was a good supply of boxes for sale.

4.0 President's Report

- M. Steiner had gone through the By-Laws and Rules and Regulations; and found, in the 1977 records, that the term of office of the Regional Director was for 3, not 2, years and not eligible for re-election.

- M. Steiner also noted that in 1976 the Rules and Regulations were modified with respect to the Achievement Awards and "Local" Awards Committees; she recommended that the functions of these two committees be incorporated into one committee.

- It was agreed to present these suggested changes at the Annual Meeting.

5.0 Treasurer's Report

- R. Holmberg presented an interim financial report that was to be presented at the Annual Meeting.

MOTION: That the annual subscription rate of the Proceedings for foreign libraries be increased from $4.00 to $6.00.

Holmberg - Craig CARRIED

6.0 Editor's Report

- R. Holmberg noted that 200 copies of the Proceedings were printed by Athabasca University for $425.

- D. Craig noted that there were 5 sets of old Proceedings ready for binding; cost would be about $100.

- D. Craig requested that any extra 1980 issues be sent to him.

MOTION: That the editor be asked to publish the list of executive officers and banquet guest speakers for 1974-1984 and to re-publish the list for 1953-1973.

Steiner - ? CARRIED

MOTION: Not withstanding a previous decision to only publish the By-Laws and Rules and Regulations every second year, and assuming that the membership agrees with the corrections/changes as outlined by the President, that the editor be asked to publish the revised By-Laws and Rules and Regulations in the 1984 Proceedings.

Taylor - Drouin CARRIED

7.0 Report of Meeting Committee

- C. Hergert noted that everything was in order.

MOTION: That an honourium be given to the photographer.

Taylor - Hergert CARRIED

MOTION: That the banquet fees for the guest speaker and his wife be waived.

Nelson - Hergert CARRIED

(Secretary's Note: Though the above motion was passed, such fees were inadvertedly collected. Thus, the speaker was given an honourarium instead.)

8.0 Secretary's Report

- See minutes of Annual Meeting.

9.0 Report on Membership of Subcommittees

- J. Drouin noted that nearly all positions had nominees.

10.0 Report of Regional Director to Entomological Society of Canada

- See minutes of Annual Meeting.

11.0 Report of Representative to the Environmental Council of Alberta

- See minutes of Annual Meeting.

12.0 Archives

- The Department of Entomology has agreed to store negatives, especially of individuals, but not large paste-ups.

13.0 Adjournment

- 6:00 p.m.

R. G. Holmberg
Secretary-Treasurer

ENTOMOLOGICAL SOCIETY OF ALBERTA
Annual Meeting
November 3, 1984
Calgary, Alberta

1.0 Call to Order

- The meeting was called to order at 10:50 a.m. by M. Steiner. About 35 members were present.

2.0 Adoption of Minutes

MOTION: That the minutes be adopted with the following changes:

- Correction of the spelling of H. Philip

- Motion No. 5 about Recommendation No. 4 should read "That the prize be administered by the Society, and that the recommendations to the President of the Society be made by *a representative* of the Department of Biology, University of Calgary ..."

Nelson - Ryan CARRIED

3.0 Business Arising from the Minutes

3.1 Entomology and the schools

- In response to a request from the Science Council of the Alberta Teachers' Association, a questionnaire was prepared about the willingness of members of E.S.A. to address teachers or their students on entomological topics. The questionnaire was distributed at the Annual Meeting and mailed to those who did not attend.

- (Secretary's Note: Questionnaires received back were sent to Mr. Brian Martin, President of the Science Council. A summary report will be presented to the membership.)

3.2 Acid Deposition Committee

- This Committee had asked E.S.A. to endorse a person from another organization to be our representative. This issue was discussed at the Executive Meeting of 11 July 1983 and tabled at the 1983 Annual Meeting.

MOTION: If a representative is needed, that Dr. Hugh Clifford be approached to serve on the committee.

Griffiths - Shemanchuk CARRIED

4.0 Reports of the Officers

4.1 Treasurer's Report

- It was noted that a bank book and some petty cash from the Joint Meeting of 1981 were accidentally overlooked when the financial statement was prepared in 1982. As they have now been uncovered, revised balance summaries for 1982 and 1983 will be included in the financial statement for 1984.

MOTION: That the Treasurer's interim report be accepted.

Holmberg - Philip CARRIED

- In order to ratify a motion from the executive, the following motion was presented:

MOTION: That the annual subscription rate for the Proceedings for foreign libraries be increased from $4.00 to $6.00.

Holmberg - Heming CARRIED

4.2 Editor's Report

- As E.S.A. had met with members of the Entomological of British Columbia in 1983, and as the latter society had at that time wished to buy copies of the Proceedings for their members, 200 copies of the Proceedings were printed. Unfortunately, the B.C. society changed its decision and requested only two copies. They were given at least enough to distribute copies to each member who had presented a paper at the joint meeting. As the photographs were not printed at the requested level of quality, the printing charges were reduced from $600 to $425.

MOTION: That the Editor's Report be accepted.

Charnetski - Heming CARRIED

- D. Craig noted that five sets of back issues of the Proceedings will be bound for potential sale. He requested that any spare copies of the 1980 issue be sent to him.

4.3 Meeting Committee's Report

- C. Hergert indicated that the meeting costs were about equal to the registration and banquet fees. He thanked everyone who helped him organize the meeting and everyone who came.

4.4 Secretary's Report

- There was no noteworthy correspondence to report. A membership report is provided at the end of the minutes.

MOTION: That the Secretary's Report be accepted.

Holmberg - Dolinski CARRIED

- Two submissions were made for an honourary member, W. Nelson and L. Peterson. The former was elected by ballot.

4.5 Regional Director's Report

- A short verbal report was given. A written report follows the minutes.

MOTION: That the Regional Director's Report be accepted.

Craig - Barr CARRIED

5.0 Review of By-Laws and Rules and Regulations

- M. Steiner found, in the minutes of 1977 Annual Meeting, that the term of office of the Regional Director to the E.S.C. was 3, not 2, years and that it expired at the end of the general meeting of the E.S.C.

MOTION: That term of office of the Common Names and Cultures Committee to the E.S.C. be for three years and that the person be eligible for immediate re-election for one more term.

Charnetski - Wong CARRIED

MOTION: That the duties of the Achievement Awards Committee (to the E.S.C.) and the Awards Committee (to the E.S.A.) be amalgamated into one committee, the Awards Committee; the members of which are to be the Past President, Regional Director to E.S.C. and the Regional Directors of the E.S.A.; and whose duties are to solicit and generate nominations of E.S.A. members for E.S.C. awards (e.g., Gold Medal, Gordon Hewitt, Norman Criddell) and E.S.A. awards (e.g., Honourary Membership, student prizes).

Heming - Shemanchuk CARRIED

6.0 Reports of Standing Committees

6.1 Achievement Awards Committee

- There were no submissions for any awards.

6.2 Awards Committee

- No student prizes were recommended this year.

6.3 Report of Representative to the Environmental Council

- A short verbal report was given. A written report follows the minutes.

MOTION: That the report of the Representative to the Environmental Council be accepted.

Shemanchuk - Griffiths CARRIED

6.4 Insect Collection Competition

- C. Hergert thanked E. Mengersen for keeping the insect collection competition going for the last several years. There were 28 entries for 1984, all from Olds College, as well as most of the 1983 winning entries that were not displayed at last year's meeting. The winners for 1984 were: Martha Wiebe (first), Leslie Howard (second), and Claude Chalifour (third). Honourable mentions went to Heather Thomas and Marc Shane. The judges were C. Hergert, R. Hughes, A. McIntosh an F. Sperling.

MOTION: That the report of the committee be accepted.

Hergert - Taylor CARRIED

6.5 Nominations Committee

- Except for the suggestion of R. Gooding as President-Elect and the re-appointment of J. Ryan as a Regional Director, the slate of officers remained the same as last year. The proposed auditors were H. Cerezke an H. Wong.

MOTION: That J. Shemanchuk should remain as the representative to the Environmental Council of Alberta for another term.

Philip - Griffiths CARRIED

MOTION: That the slate of officers and committee members be accepted a proposed.

Peterson - G. Ball CARRIED

6.6 Resolutions Committee

MOTION: Whereas the success of the thirty-second annual meeting of the E.S.A can, a=to a lrge extent, be attributed to the following, be it resolved that letters of appreciation be sent to:

1) G. Pritchard for his very interesting slide presentation on his trip to Ecuador and the Galapagos Islands;

2) C. Hergert, P. Scholefield, A. McIntosh, G. Burgess, and G. Pritchard of the Calgary organizing committee for their excellent arrangements;

3) Mount Royal College for providing meeting rooms and banquet facilities;

4) W. Nelson and U. Soehngen for the many photographs that they took of the members and their activities for our Proceedings;

5) Chairman of the Horticultural section of Olds College for the very large number and quality of the submitted insect collections.

Peterson - Spence CARRIED

6.7 Science Fair Liaison

- K. Richards noted that there were no entomological entries in Lethbridge this year.

7.0 Committees to E.S.C.

- There were no reports for the Common names and Cultures or the Membership Committees. For the Scholarships Committee, W. Charnetski noted that the members were having difficulty rating the applicants from the various institutions.

8.0 New Business

8.1 Archives

- D. Craig reminded members that the archives for the Society are kept in the Department of Entomology at the University of Alberta. Currently he is acquiring the various photographs and negatives presently stored in Agriculture Canada, Lethbridge.

8.2 Promoting Aims of the Society

MOTION: That E.S.A. donate $500 to the scholarship fund of the E.S.C.

Shemanchuk - Charnetski CARRIED

9.0 Future Meetings

- On behalf of the E.S.A. members in southern Alberta, W. Nelson invited the membership to hold the next annual meeting in Lethbridge.

- It is not certain if the Society will meet with another organization in 1986.

10.0 Adjournment

12:45 p.m.

R. G. Holmberg
Secretary-Treasurer

ENTOMOLOGICAL SOCEITY OF ALBERTA

Membership Report

1. Membership 1980-1984

Year	1980	1981	1982	1983	1984
Full members	110	106	110	99	99
Honourary members	5	5	5	4	4
Totals	115	111	115	103	103

2. Library Subscriptions 1980-1984

Year	1980	1981	1982	1983	1984
Paid	3	3	3	5	5
Free	7	7	7	7	7
Totals	10	10	10	12	12

3. Location of Membership (based on addresses)

a) General Location (n=103)

Alberta	90.3%
Rest of Canada	4.8%
Outside of Canada	4.8%
Total	99.9%

b) Location within Alberta (n=93)

Edmonton (excluding U. of A.)	26.9%
University of Alberta	16.1%
Lethbridge	24.7%
Calgary	11.8%
Other	20.4%
Total	99.9%

4. Male - Female Ratios (n=103)

Sex	%
Male	78.6
Female	16.5
Undetermined	4.8
Totals	99.9

5. Length of time with Society (n=103)

Year Joined	%	Subtotals %
1984	1.9	
1983	1.9	
1982	6.8	
1981	2.9	
1980	2.9	16.4
1979	11.6	
1978	8.7	
1977	7.8	
1976	3.9	
1975	1.0	33.0
1974	5.8	
1973	1.0	
1972	2.9	
1971	6.8	
1970	1.0	17.5
1969	2.9	
1968	3.9	
1967	2.9	
1966	23.3	
1965	No records	33.0

6. Membership payments (n=99)

Year	Prepayments/ Arrears	%
1985	+1	4.0
1984	0	60.6
1983	-1	16.2
1982	-2	12.1
1981	-3	7.1
Total		100.0

R. G. Holmberg
Secretary-Treasurer
30 October 1984

ENTOMOLOGICAL SOCIETY OF ALBERTA

Financial Statement for 1984

CREDITS	Subtotals	Totals
Bank balance as of 31 December 1983		5,323.75
Petty cash on hand on 31 December 1983		8.07
Memberships		
1986 2.5 at $4.00	10.00	
1985 84 at $4.00	336.00	
1984 60 at $4.00	240.00	
1983 23 at $4.00	92.00	
1982 9 at $4.00	36.00	
1981 2 at $4.00	8.00	
Library subscriptions (6 payments)	24.52	
U.S. exchange on memberships	10.20	
Subtotal	756.72	
Annual Meeting		
Registrations, 58 at $10	580.00	
Banquet tickets, 65 at $15	975.00	
Cash bar	198.47	
Refund on liquor	100.70	
Subtotal	1,854.17	
Miscellaneous		
Donation from Ent. Soc. Canada	200.00	
Sale of insect boxes 10 Feb. 1982 to 22 Aug. 1984)	441.80	
Transfer from Ent. Soc. Canada meeting's old account	3,347.26	
Cash from Ent. Soc. Canada meeting	40.80	
Bank interest	224.72	
Subtotal	4,254.58	
Total receipts		12,197.32

EXPENDITURES		
Proceedings		
Printing photographs for 1982	131.26	
Printing costs for 1983	425.00	
Honourarium for photography	150.00	
Transportation for sending Proceedings to Calgary for mailing	9.55	
Subtotal	715.81	
Annual Meeting 1983		
Subsidy for student members travelling to meeting in British Columbia (5 at $25)	125.00	
Prizes for insect collections for 1983 (2) (one $40 cheque outstanding)	50.00	
Subtotal	175.00	

Annual Meeting 1984		
Banquet ($13.75 per meal, plus corkage)	1,023.75	
Wine, etc. for banquet	256.70	
Cheese, etc. for reception	150.00	
Wine and beer for reception	96.00	
Coffee, muffins, etc.	63.25	
Mailing announcements (and Proceedings)	60.33	
Room rental	35.00	
Prizes for insect collections (2) (one $20 cheque outstanding)	70.00	
Honourarium for gest speaker	50.00	
Miscellaneous (maps, permits, tickets)	13.98	
Subtotal	1,819.01	
Miscellaneous		
Scholarship Fund, Ent. Soc. Canada	500.00	
Reimbursements for gas for travel (5 payments)	94.26	
Cheque book	15.48	
Bank service charges	12.75	
Rummber stamp and pad	10.01	
Receipt book	1.24	
Subtotal	633.74	
Total Disbursements		3,343.56

BALANCE SUMMARY

Assets	
Term deposits	7,500.00
Bank balance	1,353.78
Total assets	8,853.78
Total disbursements	3,343.56
Grand total	12,197.34
Liabilities	
Outstanding cheques (2)	60.00
Total	60.00

R. G. Holmberg
Secretary-Treasurer
31 December 1984

REPORT OF REGIONAL DIRECTOR

Margaret McBride has retired and was honored at the meeting. Replacements for her have been interviewed.

The Bulletin continues to be successful and it was agreed that this was an improtant form of communication within the Society. H. Liu, Bulletin Editor, requires feature photographs.

The interest from a fund, bequeathed by C. P. Alexander, will be used to reduce page charges on suitable papers in the Canadian Entomologist.

Insect Losses. Part II

The Society is to provide bridging finance for this project to allow "Culice", a private consulting firm, to continue to project on losses due to insect pests to wheat, corn, and canola.

Secretary

Dr. H. G. Wylie resigned at the end of 1984, his position being taken over by Mr. J. A. Shemanchuk.

Awards

Gold Medal - Dr. K. Davies
C. G. Hewitt - No award made.

Members are urged to submit suitable candidates for both awards, particularly the latter.

Fellowships

Dr. G. Harcourt
Dr. P. Harris
Dr. E. E. Linquist
Dr. W. D. Seabrook
Dr. I. W. Varty

Officers

Past President - Dr. R. F. Morris
President - Dr. S. B. McIver
First Vice-President - Dr. H. F. Madsen
Second Vice-President - Dr. G. G. E. Scudder
Secretary - J. A. Shemanchuk
Treasurer - Dr. E. C. Becker

Scholarships

The successfull candidates were:

Heather McAuslane - University of Guelph
Louis Mills - University of Laval

It was agreed that the value of the Scholarships be raised to $2,000 each per year.

Respectfully submitted,

Douglas A. Craig
Regional Director

REPORT OF REPRESENTATIVE OF THE ENVIRONMENT COUNCIL OF ALBERTA

As the representative of the Entomological Society of Alberta, I served the Environment Council of Alberta as Past Chairman of the Public Advisory Committees (PAC). As Past Chairman, I chaired the Resolutions Committee. I attended 9 meetings of the Coordinating Committee of PAC, 6 meetings of the Pollution Study Group, and 1 meeting of the Resolutions Committee.

Some of the highlights of the year's activities were:

1) Seven resolutions were dealt with at the Fourteenth Annual Joint Meeting of the Public Advisory Committees on the Environment and the Environment Council of Alberta.

   The Subjects of these resolutions were:

   (1) Eastern Slopes Policy
   (2) Rocky Mountain World Heritage Sites
   (3) Surface Materials Reclamation Deposits
   (4) Surface Materials, Fees, Rentals, and Royalties
   (5) New Vehicle Emission Standards
   (6) Continuation of Environment Week Conferences Annually in Alberta
   (7) History of the Environmental Movement in Alberta

2) The Public Hearings into maintaining and expanding agricultural land base in Alberta were completed and a report should be forthcoming in early 1985. This report will be studied by PAC and, if necessary, appropriate resolutions will be drafted for submission to appropriate government departments.

3) The changes to the Fish and Wildlife Policy for Alberta received considerable attention by various study groups. The subject of concern was the introduction of game ranching in Alberta.

4) An award was established to recognize residents of Alberta and Alberta organizations who have demonstrated outstanding concern for the environment. The award categories are: (1) individual; (2) business, industry, and government; (3) organizations (schools, volunteer organizations, etc.); and (4) media (print and electronic). Full details on these awards will be available soon and the ESA might keep this in mind and submit nominations.

5) A meeting with Honourable Fred Bradley was held in the Legislature Building in August. The topics discussed at this meeting were: (1) the effectiveness of resolutions in communicating with the government; (2) responses to 1982 resolutions; (3) role of the national committee on water quality; (4) lead in gasoline; (5) logging in the Upper Oldman River Basin, and (6) improving public awareness on environmental issues.

6) A meeting with Mr. Henry Kroeger and Mr. Bob Cronkite from the Water Resources Commission is seeking public input on: (1) water uses priority; (2) management procedures to support and maintain these used, and (3) contribution of the Red Deer, Bow, and Oldman Rivers to Alberta's committment to Saskatchewan.

The location of the hazardous waste plant is the Swan Hills area. Site preparation and construction of the plant will commence in 1985.

J. A. Shemanchuk
ESA Representative

BY-LAWS

ENTOMOLOGICAL SOCIETY OF ALBERTA

Article 1

Title

This Society shall be known as the Entomological Society of Alberta in affiliation with the Entomological Society of Canada.

Article II

Object

The object of the Society shall be to foster the advancement, exchange, and dissemination of the knowledge of insects in relation to their importance in agriculture, horticulture, forestry, public health, industry and, for its own sake, among the people of the Province of Alberta.

Article III

Membership, Dues, and Expenditures

a. Any person interested in entomology may become a Full Member by submitting a completed membership application form and membership fee payment to the Secretary of the Society.

   Honorary Life Membership may be conferred on anyone who has performed long and distinguished service in the field of entomology. The total of Honorary Life Members shall not exceed five percent of the total membership at the time of election. An Honorary Life Member will enjoy all the rights and privileges of Full Members but will be exempt from payment of dues. All Full Members are entitled to propose the name of prospective Honorary Life Members provided each such proposal is supported by two other Full Members and documentation is submitted in writing to the Secretary at least one month prior to the Annual Meeting. Such Honorary Life Members will be elected at an Annual Meeting.

b. A member may withdraw from the Society upon giving notice to the Secretary.

c. An annual fee necessary for the operation of the Society shall be levied from each member as provided for in Section 1 of the Rules and Regulations.

d. The Executive shall have power to meet expenses required in the normal operation of Society business. Such expenditures shall be subject to subsequent ratification at the Annual Meeting by the majority of the members present.

e. A member who neglects to pay the annual fee for two consecutive years shall automatically cease to be a member.

Article IV

Meetings

Meetings may be called each year by the President at times and places suitable to the majority of the members. The fall meeting normally shall be considered the Annual Meeting and shall be held in the locality decided upon at the preceding Annual Meeting. One-quarter of the total paid-up membership shall constitute a quorum.

Article V

Officers

The Officers of the Society shall consist of a President, Vice-President, Secretary-Treasurer, and Editor. These officers shall constitute the Executive of the Society with full power to act on behalf of the Society within the bounds of the Rules and Regulations, and to appoint committees as necessary.

Article VI

Council

The Council shall consist of the four Officers, the immediate Past-President, a Regional Director to the Entomological Society of Canada, and three Ordinary Directors. The Ordinary Directors shall represent the various fields of entomology and the geographical areas of Alberta as widely as possible.

Article VII

Elections

Elections shall be held once a year at the Annual meeting, and Officers so elected shall take office at the beginning of the following calendar year and remain in office for a term of one year.

The office of President shall not formally be held by the same person for two consecutive years. The Vice-President shall normally follow his/her term of office with a term as President. The Secretary-Treasurer and Editor shall be eligible for immediate re-election.

The Directors shall also take office at the beginning of the calendar year following their election.

The Regional Director shall be elected for a period of two years and shall then be immediately re-eligible for one more term.

The term of office of each Ordinary Director shall be three years, with one Director replaced in each year. Ordinary Directors are not immediately eligible for re-election.

Article VIII

Vacancies

Vacancies in any office (except that of President) on the Council between elections shall be filled by appointment by the President, with the concurrence of Council, the tenure of such co-opted members to terminate at the end of the calendar year during which the appointment is made. A vacancy in the office of President shall be filled by the Vice-President who will then serve his normal term as President.

Members elected at the Annual Meeting to fill vacancies on Council shall complete the period of service of the Council members whose places they have taken. On completion of this term they shall be eligible for re-election only if their period of service (co-opted and/or elected) has not exceeded 18 months.

Article IX

Duties of Officers

The President shall preside at all meetings and act ex-officio on all committees.

The Vice-President shall, in the temporary absence or disability of the President, perform the duties and exercise the powers of the President, and shall perform such other duties as shall from time to time be imposed upon the Vice-President by the Council.

The Secretary-Treasurer shall maintain a record of all meetings and act as custodian of minute books and current correspondence, and forward appropriate material to the University of Alberta for storage in the Society's archives. This person shall also receive and disburse all funds and prepare the annual financial statement.

The Editor shall receive and record reports and publications on behalf of the Society and act as editor of the Proceedings.

Article X

Signing Officers

The two signing officers of the Society shall be the President and the Secretary-Treasurer.

Article XI

Alteration of the By-Laws

The By-Laws may be altered or amended at any Annual Meeting of the Society with the approving vote of three-fourths of the members present and in good standing. Such alterations must be made by notice of motion, which shall have been sent to the Secretary and a copy of such forwarded to all members at least two weeks before the Annual Meeting.

RULES AND REGULATIONS - ENTOMOLOGICAL SOCIETY OF ALBERTA

1. a. The annual fee for full membership shall be $4.00.

   b. The fiscal year of the Society shall coincide with the calendar year; fees are payable in advance, at the time of the Annual Meeting.

2. a. An interim financial statement shall be presented by the Secretary- Treasurer at the Annual Meeting and the final, year-end statement at the first general meeting following the end of the fiscal year.

   b. Two auditors shall be appointed at each Annual Meeting to examine the accounts of the current year and the annual financial statement.

3. Registration fees for student members of the Entomological Society of Canada attending the Entomological Society of Canada meetings shall be reduced when these meetings are held in Alberta with the Entomological Society of Alberta as host.

4. The following standing committees shall exist to assist the ESA Council achieve the objectives of the Society:-

   a. Achievement Awards Committee (to the ESC) - members: ESA Council.

   b. Awards Committee (to the ESA) - members: three elected Society members.

   c. Environment Council of Alberta - one ESA member shall be elected to represent the Society.

   d. ESA-ESC Joint Meeting Committee - to be established a year preceeding any joint meeting of the Entomological Society of Canada and the Society; members to be selected from Society membership.

   e. Insect Collection Competition Committee - members: one elected member plus two other members appointed by the elected member at each Annual Meeting of the Society.

   f. Nomination Committee - members: the Past President, Vice-President, and one member in good standing shall prepare a nomination slate prior to each Annual Meeting and the Vice-President shall present the slate of nominated Executive Council members at the Annual Meeting.

   g. Resolutions Committee - members: two Society members shall be appointed immediately preceding each Annual Meeting.

   h. Science Fair Liaison Committee - members: one elected Society member; other members to be appointed as necessary by the elected member.

   All elections and appointments are not to exceed one year unless otherwise approved by the Society.

5. The Rules and Regulations may be changed by a motion approved by the majority of the members present at any general meeting.

October 8, 1981

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(Revised January 1985)

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