

PROCEEDINGS OF THE 39TH ANNUAL MEETING OF THE



Entomological Society of Alberta

Waterton, Alberta. Oct.3-5, 1991

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THE ENTOMOLOGICAL SOCIETY OF ALBERTA

The Entomological Society of Alberta was organized November 27, 1952, at a meeting held in Lethbridge, Alberta, as an affiliate of the Entomological Society of Canada. A certificate of incorporation was obtained under the Societies Act of Alberta on February 19, 1953.

The membership of about 70 paid-up members at that time consisted mainly of Dominion (Federal) entomologists at the Science Service Laboratories in Lethbridge (now Canada Agriculture Research Station), Suffield Research Station, Forest Zoology Laboratory in Calgary, and students and staff from the University of Alberta.

One of the prime motives for establishing the Society was to encourage interest in amateur entomology, which had declined from its earlier vigor. The objectives of the Society are succinctly stated in the original Constitution, which differs only slightly from the present day Bylaws:

"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, forestry, public health, and industry and, for its own sake, among the people of the Province of Alberta."

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Past President.....	C. Hergert
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1991

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Membership is open to anyone interested in Entomology. Annual dues are \$10.00 (\$5.00 for students). Contact the Treasurer, C/O Department of Entomology, University of Alberta.

## PROGRAM OF THE 39th ANNUAL MEETING

### Thursday, October 3

- 1400 Executive meeting, Crandell Room.
- 1800 Registration, Waterton-Glacier Room.
- 1900 Wine and Cheese Social, Waterton Glacier Room.

### Friday, October 4

- 0830 Registration, Waterton Glacier Room.
- 0915 Welcoming Remarks
- 0930 Symposium: "Host Resistance: Mechanisms and Applications."
- 0930 Keynote Lecture: R. J. Lamb  
"Crop Resistance to pests: the applied ecology of an insect plant relationship."
- 1030 J. R. Byers  
"The basis and utilization of resistance to the wheat stem sawfly, Cephus cinctus Norton."
- 1055 L. Dosdall  
"Evaluation of canola cultivars for ovipositional preference by root maggots, Delia spp."
- 1120 D. D. Colwell  
"Mammalian resistance to insects - manipulation of bovine responses to cattle grubs."
- 1300 Submitted Papers
- 2000 Dinner
- 2100 After Dinner Speaker: Dr. J. Dormaar  
"Sacred places and Sacred Spaces"

### Saturday, October 5

- 0800 Submitted papers
- 1100 Business Meeting

## PRESIDENT'S REPORT 1991

It is hard to believe that my tenure as President of the Entomological Society of Alberta is drawing near to a close. Serving the Society in this capacity has been an enlightening and enjoyable experience. Admittedly, at times I have felt inadequate to filling the "presidential shoes" previously occupied by many respected colleagues including some of my personal entomological heroes such as E.H. Strickland, George Hopping, Brian Hocking and George Ball. Nonetheless, despite occasional feelings of personal inadequacy, I am certain that history will record that the executive for 1991 served it's Society admirably. I wish to thank past-president Burt Schaber, vice-president John Spence, secretary Mark Goettel, treasurer Daryl Williams, editor George Evans, ESC director Alec McClay, and regional directors Rick Butts, Jim Jones, and Robert Holmberg for their dedicated service, support, and advice.

One of my last duties is to report to the membership about the activities of our society in 1991. I suspect that this year will be recorded in the annals of the Society as 'The Year of the Committee'. Motions passed at the last general meeting and the 26 August executive meeting called for the establishment of five temporary committees to address the following issues: (1) establishment of a trust fund for the Society, (2) assessment of the need for updating and reprinting the Insect Collector's Guide, (3) restructuring of the insect collection competition to encourage more involvement, (4) investigation of means to increase public awareness of and student involvement in our society, and (5) the feasibility of establishing a refereed journal/proceedings for publication of local faunal papers. The final reports of the first two committees and the interim reports of the third and fourth committee were presented at the general meeting. A motion passed at the 1991 general meeting called to abolish the fifth committee. I wish to thank all committee members for their willingness to commit significant time and effort to pursuing the mandates of these temporary committees. In addition to these activities, the executive of the Society met on 26 August and 3 October. All standing committees of the Society were active and reported to the membership at the general meeting regarding their activities. The Editor, Secretary, Treasurer, and ESC Director also reported on their activities. I am happy to report that the Society is very stable financially, due largely to income from the 1990 joint meeting. The 1991 annual meeting was a smashing success. Many thanks to Rick Butts, Burt Schaber, and Tim Lysyk for organizing a splendid meeting.

Thank you for giving me the opportunity to serve as your president. I count it a great honour and privilege. I pass the reins to the very capable hands of John Spence and look forward to the last year of my term which promises to be a very eventful year for our society. I look forward to seeing you all again at our 1992 Annual Meeting in Jasper.

David Langor

## EDITOR'S COMMENTARY

Members should be made aware of the fact that the printing of both the 38th (1990 Banff meeting; mailed in April, 1992) and 39th (1991 Waterton meeting; mailed in February, 1993) Proceedings of the Society were held up through no fault of the Editor. A major reason for these delays was the apparently painful transition of the responsibility for producing the "Photographic Highlights" section from the capable hands of Dr. W. A. Nelson, (Canada Agriculture, Lethbridge) to Edmonton. A result of this problem can be seen in this issue where the 1990 photomontages are included with those of 1991. Hopefully, the difficulties encountered in the production of these important component of the Proceedings have now been overcome. Some delays in obtaining committee reports were also encountered during the past two years. I think the Executive Committee should make it its responsibility to make sure that all reports, minutes, financial statements, membership lists, etc. be in the hands of the Editor as soon as possible after the Annual Meeting. I am grateful, however, to the authors of the submitted papers for always having the abstracts ready well ahead of schedule year after year.

Finally, I regret to inform you that after four years as Editor I am relinquishing this position to pursue other activities. In general, I have enjoyed producing the four issues; I learned a lot about computerized word processing and some of the art of creating a pleasing format of a publication that is the historical record of the Society.

W. George Evans

## ABSTRACTS OF SUBMITTED PAPERS

**CROP RESISTANCE TO PESTS: THE APPLIED ECOLOGY OF AN INSECT PLANT RELATIONSHIP.**  
R. J. Lamb, Agriculture Canada, 195 Dafoe Rd.,  
Winnipeg, Manitoba R3T 2M9

Crop resistance is a well-known strategy for controlling insect damage to our crops. This approach represents an applied study of insect-plant relationships; the crop is modified by plant breeding to shift the relationship in favour of the plant. Flea beetles in the genus *Phyllotreta* are important pests of the canola crop in western Canada, causing millions of dollars of insecticide to be applied annually, and are worthy candidates for control by crop resistance. They are specialist herbivores of plants in the family Cruciferae and their relationship to their hosts is thought to be determined by glucosinolates and isothiocyanates. These secondary plant substances, however, are discounted as important factors in developing resistance to flea beetles in canola. Crop resistance to flea beetles occurs through a combination of mechanisms: nonpreference, antibiosis, and tolerance. The process for selecting for resistance and the role of these mechanisms in the resulting resistant selection are described. The inheritance of resistance is probably polygenic, and therefore difficult to incorporate in a canola cultivar, although polygenic resistance is more likely to be stable. It is concluded that crop resistance is a feasible strategy for controlling flea beetles in canola.

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**THE BASIS AND UTILIZATION OF RESISTANCE TO THE WHEAT STEM SAWFLY, *CEPHUS CINCTUS*.**  
J. R. Byers, Agriculture Canada Research Station,  
P.O. Box 3000, Main, Lethbridge, Alberta  
T1J 4B1

The wheat stem sawfly is a native insect that originally infested the stems of wild grasses. During the early years of agriculture on the western prairies the sawfly gradually adapted to wheat as an abundant new host plant. By 1910 occasional infestations were reported and by the mid 1920's serious crop losses were occurring in some areas. Between 1938 and 1952 the

estimated annual loss due to wheat stem sawfly was \$70 million. The population of sawfly then fell sharply, largely because of the introduction, and widespread adoption, of a sawfly-resistant variety of spring wheat, appropriately named Rescue. After 1955 the sawfly population remained low for about 30 years and most farmers stopped growing resistant varieties in favour of higher yielding nonresistant varieties. During the past few years sawfly infestations have become increasingly common and in 1990 losses in Alberta and Saskatchewan amounted to over \$5 million.

In all sawfly-resistant varieties that have been developed to date, resistance is associated with a stem solidness character derived from S 615. The resistance is not complete and varies considerably from year-to-year depending on environmental conditions.

Incorporation of sawfly-resistance into varieties of hard red spring wheat with acceptable agronomic and quality characteristics was one of the earliest successes of breeding for pest resistance. However, insects have a remarkable ability to adapt, and it is likely that the wheat stem sawfly will eventually overcome the resistance possessed by the available resistant varieties. There is some evidence that this is already occurring.

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**COMPARISONS OF CANOLA SPECIES AND CULTIVARS FOR SUSCEPTIBILITY TO INFESTATION BY ROOT MAGGOTS (*DELIA* SPP.).**  
L. M. Dosdall, M. J. Herbut, and N. T. Cowle,  
Alberta Environmental Centre, Bag 400,  
Vegreville, Alberta T0B 4L0

Seven cultivars of *Brassica rapa*, 13 of *Brassica napus*, seven of *Brassica juncea*, and two of *Sinapis alba* were evaluated for their relative susceptibilities to infestation by root maggots (*Delia* spp.). Oviposition by females and damage to roots from larval feeding were used to measure the degree of infestation by root maggots to the different crucifer species and cultivars. Female oviposition was determined by visual counts of root maggot eggs laid on

individual plants throughout the growing season. Root damage was assessed at the end of the season using a semi-quantitative rating scale based on the root surface area damaged by root maggots; the scale ranged from 0 to 5, with roots completely undamaged rated as 0 and roots completely severed by feeding of root maggot larvae rated as 5. Species of Cruciferae differed significantly in their susceptibilities to infestation by root maggots. Plants of *B. rapa* were most susceptible, followed by plants of *B. napus*, *B. juncea*, and *S. alba*. Although statistically significant differences in infestation were observed among cultivars of *B. rapa*, *B. napus*, and *B. juncea*, differences in susceptibility were greater between species than between cultivars within species.

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THE PALEOENVIRONMENT OF THE EOCENE FORESTS OF BRITISH COLUMBIA: A TOURIST'S INTERPRETATION. Burton D. Schaber, Agriculture Canada Research Station, P.O. Box 3000, Main, Lethbridge, Alberta T1J 4B1

About 47-52 Ma BP I was driving, excuse me, riding my Eohippus horse near the coastal village of Haemorrhoidalis, a trogolyte town on the outer fringes of civilization, in northern Pangea on my way to the North Pole from the Land of Mu. The climate here was warm temperate, with wet summers and dry winters, and more continental than other coastal climates at the same latitude. The forests were of mixed deciduous-coniferous composition. The fauna was comprised of fishes, molluscs, spiders, birds, reptiles, mammals, and, of course, the ever present insects. More than 200 families of insects have been recognized from this area. Collecting was easy in the meadows adjacent to the large lake.

However, on a subsequent collecting trip to this area in A.D. 1980, now known as Smithers, only 25 specimens, representing 6 orders and 10 families, were collected in the fine-grained tufaceous shales of the Eocene formations during 10 hours of collecting. The total identified insect fauna contains representatives of 30 families in 7 orders. In numbers of individuals it is dominated by Bibionidae of the genus *Plecia*, although Gerridae, large Homoptera, and

Ichneumonidae are abundant. Coleoptera are rare.

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DESCRIPTIONS OF COSTA RICAN *HETAERINA* LARVAE. Jacek Zloty and Gordon Pritchard. Department of Biology, University of Calgary, Calgary, Alberta T2N 1N4

There are 9 species of *Hetaerina* in Costa Rica, but they are currently known only in the adult stage. By first associating larvae with adults through starch gel electrophoresis, we were able to find morphological characters that separate larvae of all 9 species. These characters are on the antennae, head, pronotum, front femora, abdominal tergites and caudal appendages. Each species can be separated from every other species at 2 or more loci by using only 6 loci. Most larvae have several characters that differentiate them, but *H. caja* and *H. occisa* are very close morphologically, although very far apart electrophoretically.

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DYAR'S RULE AND MULTIVARIATE ALLOMETRIC GROWTH IN NINE SPECIES OF WATERSTRIDERS (HETEROPTERA: GERRIDAE). C.P. Klingenberg and M. Zimmerman. Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

The constancy of postmoult/premoult ratios of measures of linear size during ontogeny in insects and other arthropods is widely known as Dyar's rule. We tested this rule in nine species of the waterstrider genera *Gerris* and *Aquarius* (Heteroptera: Gerridae), using two size variables: head width and a multivariate measure derived from the pattern of multivariate allometry common to the species considered. Allometric patterns were similar in two independent datasets of laboratory-reared and field-caught specimens. Although our data strictly followed Dyar's rule in just a few instances, all growth ratios varied within a limited range only. Growth ratios for head width differed more between moults than those for multivariate size. The relationship between growth ratios for the two size measures conformed to the predictions based on allometry. We discuss hypotheses of the possible adaptive significance of growth ratios, such as their relation to mobility and systematic differences

between hemimetabolous and holometabolous insects, and emphasize the importance of allometry. Since Dyar's rule is consistent with available evidence of physiological mechanisms underlying growth and moulting control in insects and crustaceans, it can be used as a general frame of reference to test alternative growth models.

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EVOLUTION OF WING POLYMORPHISM IN WATER STRIDERS (HETEROPTERA: GERRIDAE). N. M. Andersen, Zoological Museum, University of Copenhagen, Denmark

In several groups of insects, species exhibit polymorphisms that affect their flight ability. Variations in wing length and flight muscle development are the most obvious examples, as is a conspicuous feature of water striders (family Gerridae). The diverse patterns of wing polymorphism in water striders make this group ideal for comparative studies. Gerrid populations may be either monomorphic long-winged, wing dimorphic (permanent or seasonal), or monomorphic short-winged (long-winged morph very rare). Water striders inhabit various types of freshwater habitats and the adaptive significance of wing polymorphism has been explained mainly in relation to different degrees of habitat permanence.

Patterns of dispersal polymorphism, beside having ecological functions, also have unique evolutionary histories. In order to understand the origin and maintenance of such adaptations, they can most profitably be considered within their phylogenetic context. In this paper, patterns of wing polymorphism observed in temperate gerrid species belonging to the genera *Aquarius*, *Gerris*, *Limnoporus* are related to reconstructed phylogenetic (cladograms) for these genera. In particular, I ask which state(s) of wing polymorphism were ancestral for these genera, and which pathways have been followed during the evolution of patterns observed among species.

SOLATION OF INSECT MIDGUT EPITHELIA: A NEW TECHNIQUE. B. A. Keddie, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3, and E. K. Engelhard and I. E. Volkman, Department of Entomology and Parasitology, University of California, Berkeley, California

The epithelial cell layer of an insect midgut has been separated from underlying connective tissue. This separation technique utilizing the neutral protease, dispase, can be used to generate intact living epithelial monolayers. The cell populations of these monolayers can be characterized using fluorescent probes and/or immunostained for the presence of pathogens. With these techniques entire midguts can be examined more rapidly than with previous histological methods.

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TSETSE SATYRS: FEMALE SATISFACTION NOT GUARANTEED. R. H. Gooding, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

Experiments with reared tsetse flies were conducted to test 1) Eberhard's theory that stimuli received from a male during copulation influences whether a female will use the sperm received, and 2) two aspects of Ribeiro's suggestion that satyrs (*i.e.* males that will mate with females from taxa different from that of the male) can be used as biological control agents. Females were mated twice (once with a male from their own subspecies and once with a male from a closely related subspecies). The order of mating did not influence the likelihood of mating a second time in most taxa [*G. m. morsitans* (= Gmm), *G. m. submorsitans* (= Gms), *G. p. palpalis* (= Gpp), *G. p. gambiensis* (= Gpg)], but *G. m. centralis* (= Gmc) females that mated with consubspecifics were less likely to mate a second time (with Gms) than were Gmc females that mated first with Gms and were then offered an opportunity to mate with Gmc. Female Gmc (mated with Gmc and Gms), female Gms (mated with Gmc and Gms), and female Gmm (mated with Gmc and Gmm) almost always (57 of 58 females) used sperm of consubspecifics only, whilst 7 of 11 Gpp (mated with Gpg and Gpp) used sperm of consubspecifics and (or) satyrs, and 4 of 9 Gpg

(mated with Gpg and Gpp) used sperm of consubspecifics and satyrs. The results offered no support for Eberhard's hypothesis and suggested that satyrs may not be effective against *Glossina morsitans* subspecies if polyandry occurs in nature.

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**PREMATING SEX RATIO AFFECTS MATING BEHAVIOUR OF WATERSTRIDERS.** Kari Vepsäläinen and Riita Savolainen, Department of Entomology and Department of Zoology, University of Alberta, Edmonton, Alberta T6G 2E3

Because males are able to produce practically unlimited amounts of sperm but females only a limited number of high-energy eggs, males are believed to strive for maximizing quantity (the number of females fertilized), but females, quality of the male, *i.e.*, to be choosy. Experiments on a variety of insects support this view. They also show that operational sex ratio (OSR) may boost or mitigate the basic conflict between the sexes, depending on the way OSR is skewed. Because OSR before and during mating may differ, we planned an experiment to study the impacts of possibly conflicting OSR between recent history and ambient mating environment on the mating behaviour of a European waterstrider, *Gerris lacustris* - a species known for its radical short-term within-population variation in OSR. Although our experiments could not deny the importance of OSR of the ambient mating environment, we were able to assess statistically significant effects only for the varying OSR preceding mating. The results are in general accordance with theories on mating behaviour: male-biased OSR lengthened the mating-guarding phase of the males, and females resisted mating males less; female biased OSR shortened the mating phase of males and encouraged the females to cut the mating short.

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**STIMULATION OF OVIPOSITION BY TESTES EXTRACT AND HEMOLYMPH FACTOR IN SPRUCE BUDWORM.** M.-P. Rivet, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3 and P. J. Albert, Department of Biology, Concordia University, Montreal, Quebec.

In spruce budworm (*Choristoneura fumiferana*), a substance of testicular origin is transferred from the male to the female. An hemolymph factor also seems involved. However, these substances do not appear to affect all aspects of oviposition in the same way.

Oviposition (number of eggs laid) is not stimulated by the injection of testis extract but may be stimulated by the injection of hemolymph from mated females. The hemolymph of mated females has stimulating properties from 2 to 12 hours after separation of the mating pair, but loses this ability between 12 and 24 hours after separation.

Oviposition site selection is induced by both injections of testis extract and hemolymph from mated females. Again, the active factor in hemolymph is present 2 to 12 hours after separation of the mating pair after which time the hemolymph loses its stimulatory effect.

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**EFFECT OF PARASITISM BY *COPIDOSOMA BAKERI* ON CROP DAMAGE DYNAMICS OF THE ARMY CUTWORM.** J. R. Byers, D. Yu and J. W. Jones, Agriculture Canada Research Station, P.O. Box 3000, Main, Lethbridge, Alberta T1J 4B1

Army cutworm was a significant pest in southern Alberta, in 1990. The overall incidence of parasitism by *Copidosoma* in samples from seven different infestations was 61%. Cutworms parasitized by *Copidosoma* feed longer and become considerably larger than those that are not parasitized. The high rate of *Copidosoma* parasitism during the 1990 outbreak exacerbated crop damage and complicated control recommendations.

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THE EFFECT OF CROP TYPE AND MANAGEMENT ON THE ACTIVITY OF NATURAL ENEMIES. Héctor Cárcamo and John R. Spence, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

We studied the effect of farming method (organic vs. chemical and vegetation type (barley, faba bean, fescue grass, barley-pea intercrop) on ground beetle activity using pitfall traps. Overall carabid activity was similar in the crop types but differed from that observed in fescue grass and a nearby uncultivated meadow. Also, we investigated predation pressure in these four vegetation types using three size classes of fly pupae as artificial prey. Rates of pupae disappearances over 24 hours reflected the above pattern of carabid activity over the four crop types. Mark recapture experiments with *Pterostichus melanarius* suggest that crop species diversity can enhance immigration rates of natural enemies.

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FIELD AND LABORATORY STUDIES WITH THE ENTOMOPATHOGENIC FUNGUS *BEAUVERIA BASSIANA* AGAINST GRASSHOPPERS IN ALBERTA. Mark S. Goettel and Dan L. Johnson, Agriculture Canada Research Station, Box 3000, Main, Lethbridge, Alberta T1J 4B1.

Laboratory and field studies have identified the entomopathogenic fungus *Beauveria bassiana* as a potential microbial control agent of grasshoppers in Alberta. Conidia are effective when ingested or applied to the host integument. The LD<sub>50</sub> is ca. 10<sup>5</sup> spores per grasshopper at 7 days and the LT<sub>50</sub> (ingestion) is ca. 3 days more than the LT<sub>50</sub> (topical). A field trial was conducted at Vulcan, AB during June, 1991 in a fallow field with an initial grasshopper population density of about 35 per m<sup>2</sup>. Three 2.25-ha plots were treated with 2 x 10<sup>13</sup> spores per ha, applied in 10 kg of bran bait with 2% molasses. The bait was applied using a truck-mounted, motor-driven bran blower. Grasshoppers were collected from the treated plots over a period of 20 days and held in the laboratory. Up to 77% of the field-collected grasshoppers were found to be infected with the fungus from 2 to 9 days after application; 5% of

grasshoppers collected 20 days post application were still infected. Within 9 days of treatment, the number of grasshoppers in the treated plots were reduced by 60%, with almost no change in the untreated plots. By 15 days after treatment, the reduction was still more than 30% relative to the untreated plots; grasshopper migration may have obscured the treatment effect by this time. These promising results warrant further research into the possible development of this fungus as a microbial control agent of grasshoppers in Alberta.

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TEMPERATURE REQUIREMENTS FOR DEVELOPMENT OF *CALOPHASIA LUNULA* (LEPIDOPTERA: NOCTUIDAE), A POTENTIAL BIOLOGICAL CONTROL AGENT FOR TOADFLAX. A. S. McClay, Alberta Environmental Centre, Vegreville, Alberta T0B 4L0

The European noctuid *Calophasia lunula*, a defoliator of toadflax (*Linaria vulgaris*), has been used as a biological control agent against this introduced perennial weed in North America. It is established in Ontario and Montana, but despite extensive releases it has not become established in Alberta. A study of its temperature requirements for development was conducted to ascertain whether *C. lunula* should be able to complete development under summer temperatures in Alberta. A day-degree model was developed and compared with temperature records from parts of Alberta where releases have been made, and from areas where the insect is established. Results to date suggest that most areas of Alberta are too cool for the insect to complete development in the growing season. Development may be possible in extreme southeastern Alberta. Areas where *C. lunula* is established have sufficient day-degrees for complete development according to the model.

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WHO ARE THE GERRID EATERS? John R. Spence, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

Dramatic differences in survival of two gerrid species are demonstrated among three natural habitats. In addition, there was significant seasonal and year to year variation. Variation in

food availability accounts for little of the variation in gerrid survival. Mean abundance of potential predators is roughly correlated with variation in survival across habitats, but the explanatory power of this variable is weak. All potential predators captured in activity traps or standardized sweep samples (12 taxa in total) were tested for ability to capture and consume gerrid nymphs. These data were standardized and weighted by season-specific estimates of abundance to calculate 'impact coefficients' for each predator. Impact coefficients are summed and used as an estimate of predation pressure experienced by gerrids during each seasonal period. I ask if predation pressure, so defined, provides a better explanation for variation in gerrid survival observed in exclosures. The answer may be revealed in Waterton. If not, a series of informal excuses will be offered.

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HOST EFFECT ON *LATHROMEROIDEA* SP. N. (HYMENOPTERA:TRICHOGRAMMATIDAE). Nidia Henriquez Moreno and John R. Spence, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

A trichogrammatid, *Lathromeroidea* sp. *nova*, is reported from eggs of water striders (Gerridae). This constitutes a new host record for the genus which is known only from eggs of Odonata. Wasps were reared using eggs of various species of Gerridae. Effects of host species on the parasitoid's development and reproductive output are discussed, as is the pattern of parasitism observed under field conditions.

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*LEPIDURUS COUESII* (CRUSTACEA: NOTOSTRACA) PREDATION BY *DYTISCUS CIRCUMCINCTUS* LARVAE: A COST OF SEXUALLY DIMORPHIC BEHAVIOUR? E. Straszynski, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

*Lepidurus couesii* shows sexually dimorphic behaviour associated with reproduction: males move farther, and more frequently than females and are more likely to initiate intraspecific contact. Predation may be a cost opposing selection for heightened activity, especially by predators that locate prey by their

movement. In single prey trials, sex of the prey made no difference in capture time by *Dytiscus circumcinctus* larvae, but experienced larvae had significantly lower capture times. In paired-prey trials, males were caught first more often than female *L. couesii*, although capture times were not affected by sex or predator experience. Field examination of scars comparable to those inflicted by the predator in the laboratory experiments showed no discernible trend in the proportion of either sex scarred, scarring intensity, or seasonal changes.

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DETECTION OF MUCUS-PRODUCING PREY BY *CARABUS NEMORALIS* MUELLER AND *SCAPHINOTUS MARGINATUS* FISCHER (COLEOPTERA: CARABIDAE) Scott Digweed, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

Male and female *Carabus nemoralis* and *Scaphinotus marginatus* were tested for orientation towards mucus trails deposited by the slug *Deroceras reticulatum* and by *Lumbricus* sp. earthworms using an X-shaped orientation chamber similar to that used in Wheeler (J. Zool. Lond. [1989] 218: 171-185). Orientation in *Carabus* was highly variable between manipulations and over time, with females being much more variable than males. In early June, *Carabus* females oriented to both slug and earthworm mucus, whereas males only oriented to earthworm mucus. Orientation disappeared in both sexes by late June; this corresponds well to the end of the spring active period of males in the field, but not to that of females, which is just beginning at this time. Contrary to the results obtained in Wheeler (1989), brushing the palpi and antennae with glycerol did not block orientation to earthworm mucus in *Carabus* females.

*Scaphinotus* showed no orientation to either mucus type. Orientation was equally random in male and female *Scaphinotus*; no change in orientation occurred over time, nor over the two temperatures tested (23-24°C and 16-17°C). A marked decrease in *Scaphinotus* activity in the X-chamber under "substrate" conditions (X-chamber lined with peat moss and leaf litter) at 23-24°C hints at the artificiality of

laboratory evaluations of behaviour; given the chance, *Scaphinotus* would much rather "hide" in the leaf litter than actively "orient" in the X-chamber experiments.

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SOME IMPLICATIONS OF HOST USE BY THE FOREST TENT CATERPILLAR (*MALACOSOMA DISSTRIA* HBN.) Dylan Parry and John R. Spence, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3

We studied the effects of five different host species frequently consumed by last instar forest tent caterpillar larvae. Fifth instar larvae often abandon the primary host, trembling aspen (*Populus tremuloides*) even though ample foliage remains for the completion of development. Groups of field collected 4th instar larvae obtained from aspen, were reared on foliage from balsam poplar (*Populus balsamifera*), wild rose (*Rosa acicularis*), Alaska birch (*Betula neoalaska*) and Saskatoon (*Amelanchier alnifolia*). Pupal mass, development time, survivorship and feeding efficiency of larvae on these non-preferred hosts were compared to those of caterpillars maintained on aspen foliage. The results differ in some aspects from those obtained in similar transfer experiments carried out in 1989. The results suggest explanations for the characteristic wandering behaviour of last instar tent caterpillar larvae.

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EFFECTS OF FORESTRY ON CARABID ASSEMBLAGES OF BOREAL FOREST IN WESTERN ALBERTA. Jari Niemelä and John R. Spence, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3 and David Langor, Forestry Canada, Northwest Region, 5320 - 122 Street, Edmonton, Alberta T6H 3S5

Results of pitfall trapping showed that carabid abundance was comparable or higher while species richness was lower in mature, natural stands than in sites cut and reforested <10 years ago. The grouping of the carabid fauna of the stands in a similarity analysis according to their age may reflect variation in habitat parameters, landscape effects of logging or both. Forest cutting clearly alters carabid assemblages by favouring species of open habitat and possibly threatening mature forest specialists.

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EVALUATION OF ENCAPSULATED CARBOFURAN FORMULATIONS AGAINST THE SORGHUM APHID. R. Krishnaraj, Department of Biology, University of Calgary, Calgary, Alberta T2N 1N4

An experiment was carried out under greenhouse conditions in India to test the efficacy of starch-encapsulated carbofuran granules (Encecap A 2.9G and Encecap D 3G) in comparison with standard carbofuran (Furadan 3G) against the sorghum aphid., *Rhopalosiphum midis* Fitch. Calculated quantities of each formulation were applied to the root zone and mortality was measured in aphids confined in small cages on the leaves. Encecap D was the most persistent formulation, followed by Encecap A and Furadan, although the difference between the latter two was not significant. Further testing under field conditions is required in order to produce recommendations for farmers.

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# 38th ANNUAL MEETING, BANFF, ALBERTA, October 1-5, 1990

|                                                   |                                         |                  |                                         |                    |               |                         |                                              |                                               |                                                 |                 |                                            |              |
|---------------------------------------------------|-----------------------------------------|------------------|-----------------------------------------|--------------------|---------------|-------------------------|----------------------------------------------|-----------------------------------------------|-------------------------------------------------|-----------------|--------------------------------------------|--------------|
| <i>"There's nothing here but a bunch of bugs"</i> |                                         |                  | Rick West                               |                    | John Laing    |                         | <i>"That question's worth a 2 out of 10"</i> |                                               |                                                 |                 |                                            |              |
| Burt Shaber                                       |                                         |                  | Bert Carr                               |                    | John Carr     |                         | Richard Ring                                 |                                               | <i>"Honesht! it's only my 1,2,3 - 6th beer"</i> |                 | Jean Turgeon                               |              |
|                                                   |                                         |                  |                                         |                    |               |                         | <i>"Mr. Christie, you make good cookies"</i> |                                               | Paul Reigert                                    |                 |                                            |              |
|                                                   |                                         |                  |                                         |                    |               |                         |                                              |                                               | Ron Aiken                                       |                 | Fiona Hunter                               |              |
| <i>"Please hold the applause 'til later"</i>      | Tara Sanota                             | G.G.E. Scudder   |                                         | George Ball        |               | Doug Currie             |                                              | C. Daniel                                     | <i>"God I hate their supercilious smiles"</i>   |                 | Ben Gadd after dinner speaking (& singing) |              |
| Hector Carcamo                                    |                                         |                  |                                         |                    |               |                         |                                              |                                               | Jeremy McNeil                                   |                 |                                            |              |
|                                                   |                                         |                  |                                         |                    |               |                         |                                              |                                               | Rob Leech                                       |                 | Rick Butts                                 |              |
| J.C. Cunningham                                   | Dr. 'Bowtie' Becker                     | Jacques Regniere |                                         | Al Ewen            |               | Valerie Behan-Pelletier |                                              | <i>"Ha, Ha no! I'm not John Spence"</i>       |                                                 | Charles Vincent | Bernie Roitberg                            | Rob Cannings |
|                                                   |                                         |                  |                                         | Editors Convention |               |                         |                                              |                                               |                                                 |                 |                                            |              |
| S. Tobe                                           | <i>"Please Dave give the next talk"</i> |                  | <i>"I've no idea what it is either"</i> |                    | Lloyd Dosdall | Dale Wrubleski          | Judith Myers                                 | <i>"Drink this brand - I get 10% royalty"</i> |                                                 | Joe Shemanchuk  | Joe Shorthouse                             | Dolf Harmsen |
|                                                   |                                         | Burt Shaber      | Dave Langor                             | T. Lysyk           |               |                         |                                              |                                               |                                                 |                 |                                            |              |
| Jim Ryan                                          | Brian Brown                             |                  | John Acorn                              |                    | Tim Spanton   |                         | Felix Sperling                               |                                               | Peter Kevan                                     |                 | John Borden                                | Hugh Danks   |
| Jessica Ernst                                     |                                         | Bert Finnamore   | Art Back to nature Borkent              | Donna Goberson     | Mark Goetel   |                         | Bob Anderson                                 |                                               | Jim Sutcliffe                                   | Bob Lamb        | Two Entomoladies relaxing                  |              |







|                                      |                 |                 |                |                   |                         |                 |                |                                |                                  |           |
|--------------------------------------|-----------------|-----------------|----------------|-------------------|-------------------------|-----------------|----------------|--------------------------------|----------------------------------|-----------|
| Don Bright                           | Bob Footit      | Richard Ring    | Dean Mulyk     | Doug Eidt         | Valerie Behan-Pelletier | David Clements  | Felix Mwangala | Thelma Finlayson               | Bruce Heming                     | Jim Jones |
| 'money talk'                         |                 |                 |                |                   |                         |                 |                |                                |                                  |           |
| Ken Richards                         | Peter Kevan     | Betty Reigert   | Linda Gilkeson | Doug Currie       | Kay Ball                | Jeremy McNeil   | Herb Cerezke   | Dan Quiring                    | "why does nobody know her name?" |           |
| John Spence                          | Pat McKay       | Bryan Beirne    | Ed Becker      | Doug Craig        | Nidia Henriquez         | Ed Becker       | George Ball    | Ced Gillot                     | Mike Dolinski                    |           |
|                                      |                 |                 |                | 'a familiar pose' |                         |                 |                |                                |                                  |           |
| Peter Harris                         | Joe Shorthouse  | Charles Vincent | Bob Jaques     | Gary Gibson       | Donal Hickey            | John Spence     | Bob McDonald   | Graham Griffiths               | Elizabeth Tomlin                 |           |
|                                      | Robert Holmberg |                 |                |                   |                         |                 |                |                                |                                  |           |
| "I'll tell you when i've had enough" | Darren Pollock  | Bob Byers       | Doug Eidt      | H.R. McCarthy     | Marilyn Steiner         | The Pritchards  | Barry Bai      | John Richardson                |                                  |           |
| Ron and Sheila Gooding               |                 |                 |                |                   |                         |                 |                |                                |                                  |           |
| G.R.Wyatt                            | K. lafrou       | Jessica Ernst   | Sandy Smith    | Unknown Entoman   | Jan Leferink            | Wayne Fairchild | John Sweeny    | Jan "What's happening?" Volney | G. Boivin                        |           |
|                                      |                 |                 |                |                   |                         |                 |                |                                |                                  |           |
| Art Tellier                          | Burt Shaber     | Imre Otvos      | Jens Roland    | Imre Otvos        | Les Safranyik           | John Doane      | Bob Lamb       | George Ball and the Carrs      |                                  |           |
| 'Traditional Talk'                   |                 | Don Bright      |                |                   |                         |                 |                |                                |                                  |           |

# 39th ANNUAL MEETING, WATERTON, ALBERTA, October 3-5, 1991

|                                                                     |                                                                       |                                    |                                                                |                                                          |                                                                  |                                  |  |
|---------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------|----------------------------------|--|
| chit chat in the afternoon sun                                      |                                                                       |                                    |                                                                | more chit chat                                           |                                                                  |                                  |  |
| an enthusiastic audience                                            |                                                                       | Chris Klingenberg                  | "I thought for sure - 8-ball corner pocket"<br><br>John Spence | Alec McClay                                              | Mark Goetel                                                      | Gordon Pritchard<br><br>Bob Lamb |  |
| "Put this in your purse and I'll drink it later"<br><br>The Schaffs | Rick Mikalonis<br><br>Dave Langor                                     |                                    |                                                                | "I need one more number for a Bingo"<br><br>George Evans | "Who needs one more number for a Bingo?"<br><br>Gordon Pritchard |                                  |  |
| "Hey gringo where's that beer I ordered?"<br><br>Hector Carcamo     | Daryl Williams<br><br>Nidia Henriquez                                 | Dave Langor                        | Pat Scholefield                                                | R. Cuny                                                  | Marie-Pascale Rivet                                              | Elizabeth Straszynski            |  |
| The Dolinski's with Mike in the midst of a hair raising story       |                                                                       | Jim Weber<br><br>Tracy Kutash      | Alec McClay<br>your smiling weed doctor                        | Beauty and the Beast                                     |                                                                  |                                  |  |
| "Uh oh - 'Im up next"<br><br>Grant McIntyre                         | Marianne Nylund<br>Jari Niemelä<br>....another trip to the punch bowl | Marilyn Steiner<br><br>Art Tellier |                                                                | Burt Schaber                                             | John Dormaar                                                     | Bert Finnamore                   |  |
| morning coffee                                                      |                                                                       | Nils Møller<br>Anderson            | Colin Hergert                                                  | Jessica Ernst                                            | Jim Ryan                                                         | Mark Goetel                      |  |







|                                                                       |                                                                 |                                              |                                                                        |                                                                              |                                    |                                                                         |
|-----------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------|
| George Ball's<br>summer cottage                                       |                                                                 | the mob at happy hour                        |                                                                        |                                                                              | the view<br>from G.E.B.'s cottage  |                                                                         |
| Mark<br>Goetel                                                        | Jack<br>Zloty                                                   | Hector<br>Carcamo                            | Terry<br>Thormin<br><i>"we know<br/>nothing about<br/>any cutlery"</i> | Al Schaff                                                                    | Scott<br>Digweed                   | George<br>Evans<br>Ted Pike<br>Liz<br>Straszynski<br>Nidia<br>Henriquez |
| <i>"I just love<br/>this Super<br/>Mario game"</i><br>Jari<br>Niemelä | Bob<br>Byers                                                    | Bob Lamb<br>- the keynote speaker            |                                                                        | Jerry<br>Weintraub<br>Evan<br>Gushel                                         |                                    | Alec<br>McClay<br>Lloyd<br>Dosdall                                      |
| Graham<br>Griffiths                                                   |                                                                 | Terry<br>Thormin                             | Daryl<br>Williams                                                      | <i>"That's<br/>twice I've<br/>beaten<br/>you Jari"</i><br>Nidia<br>Henriquez | Lloyd<br>Dosdall                   | <i>"I'm not<br/>whistling<br/>Dixie"</i><br>Ron<br>Gooding              |
| R.<br>Krishnaraj                                                      |                                                                 | Tim Lysyk                                    |                                                                        |                                                                              |                                    |                                                                         |
| Kari<br>Vepsalainen                                                   | Ted<br>Pike                                                     | Kay<br>Ball<br>Jim<br>Ryan<br>Ron<br>Gooding |                                                                        | Marie-<br>Pascale<br>Rivet                                                   | Jim<br>Ryan<br>Clare<br>Shemanchuk | Doug<br>Colwell                                                         |
| Jim Weber                                                             |                                                                 | R.<br>Krishnaraj                             |                                                                        | Art<br>Tellier                                                               | Paul<br>Wilkinson                  | Jessica<br>Ernst                                                        |
| Ken<br>Richards                                                       | Mike<br>Dolinski                                                | Lloyd<br>Dosdall                             | F.A.<br>Siddiqui                                                       |                                                                              |                                    |                                                                         |
| Manfred<br>Zimmermann                                                 | Dylan<br>Parry<br><i>"can you<br/>tell I just<br/>woke up?"</i> | Gordon<br>Pritchard                          | Ron<br>Gooding<br><i>"that's a good one Gord."</i>                     | <i>"My fans are<br/>everywhere"</i><br>Jim<br>Ryan                           | Andy<br>Keddie                     | welcome from<br>the park<br>superintendent                              |

ENTOMOLOGICAL SOCIETY OF ALBERTA  
MINUTES OF EXECUTIVE MEETING, October 3, 1991

Bayshore Inn, Waterton

|          |             |              |              |
|----------|-------------|--------------|--------------|
| Present: | Rick Butts  | George Evans | Mark Goettel |
|          | Jim Jones   | Dave Langor  | Alec McClay  |
|          | John Spence |              |              |

Meeting called to order at 6:53 p.m.

Approval of Agenda:

MOTION: McClay/Schaber: That the agenda be adopted.

Adoption of minutes:

MOTION: Butts/Schaber: That the minutes of the 26 August, 1991 Executive Meeting be adopted.

Business arising from previous meetings:

Trust Fund (temporary) Committee: Dave Langor felt that the executive should form some consensus regarding this matter as he felt that the executive may be called upon at the annual meeting for an opinion. After some discussion it was felt that it would be best if we remained as liquid as possible and that a Trust Fund per se was probably not necessary. However, longer term investment account with higher interest rates may be a good idea.

Insect Collection Contest (temporary) Committee: Nothing to report.

Insect Collectors Guide (temporary) Committee: There was little response to questionnaire mailed out by Pat Scholefield.

Public Awareness (temporary) Committee: Rick reported that the committee was looking into ways of increasing student activity in and public awareness of the Society. He will prepare an interim report after discussions with members during the meetings. A final report will be presented at the 1992 annual meeting.

Society Refereed Journal/Proceedings (temporary) Committee: Dave Langor indicated that there was a need to establish what market such a publication would have and if members would be willing to contribute good papers to such a publication. This item will be discussed further at the general meeting.

1992 ESA Annual Meeting: Dave Langor investigated 3 possible venues: Red Deer, Rocky Mountain House and Jasper and concluded that Jasper would be the best location with costs only slightly higher than the other venues. Dave Langor will head the organizing with Daryl Williams and will select a scientific program chair in due course.

Other business : None



## Officers' Reports

**Treasurer's report:** In the absence of Daryl Williams, Dave Langor reported that the 1990 books had not been audited yet. In future years, books should be audited by February.

**Secretary's report:** Mark Goettel reported that he received two letters which he dealt with.

**Editor's report:** George Evans reported that he is still awaiting photographs and the financial report( pending auditing) before he can proceed with publication of the 1990 Proceedings. He hopes to have them published by February. He noted that, in the future, every effort be made so that the Proceedings can be published before the next meeting.

**Regional Director's report:** Alec McClay noted that a list of officers elected to the ESA need to be forwarded to the Bulletin Editor. Dave Langor reported that a report on ESA activities were sent to ESC.

## Committee Reports

**1991 Annual Meeting Organizing Committee:** Rick Butts reported that everything was going according to schedule and that the registration fee was a bit higher than in the past in order to cover all expenses. There are 27 submitted papers.

**Nominations Committee:** John Spence reported that the nomination for Director South was Tim Lysyk and Vice President was Rick Butts. Otherwise, present executive members were willing to serve for another term.

**Membership Committee:** John Spence had nothing to report. Dave Langor suggested that new arrivals (e.g. students) to the province be sent a letter of invitation to join the Society following the Annual Meeting.

**Science Fair Liason Committee:** John Spence had nothing to report. He mentioned that there were strict rules for the Edmonton Regional Science Fair which he is looking into. It is desirable to present a book prize instead of plaques as required by the Science Fair.

**Awards Committee:** Bert Schaber reported that a submission for the Gordon Hewitt Award was being made. Letters soliciting ideas will also be mailed to members.

**New Business :** None

**Adjournment:** MOTION: McClay/Butts that the meeting adjourn. 7:30 p.m.

ENTOMOLOGICAL SOCIETY OF ALBERTA  
MINUTES OF THE ANNUAL MEETING

Bayshore Inn, Waterton, 5 October 1991

Meeting called to order at 11:30 a.m. by President Dave Langor.

Approval of Agenda.

MOTION: That the agenda be approved. Leech/Butts. CARRIED.

Greetings from the Entomological Society of Canada.

Alec McClay reported that John Laing was unable to attend the meetings but sends his greetings and best wishes.

Adoption of minutes of previous Annual Meeting.

MOTION: That the minutes of the previous meeting be adopted. Dolinski/Finnamore. CARRIED.

Business arising from previous meetings.

Trust Fund (temporary) Committee: Burt Finnamore presented the report previously distributed to members.

MOTION: To adopt recommendations of the Trust Fund Committee. Finnamore/Williams. Much discussion about the need of a trust fund, why a trust fund, the legalities of the term "trust fund" etc. ensued. The more the discussion progressed, the more confusing the issue became. Several motions were made in an attempt to clarify the situation; however, after some discussion, they were all withdrawn.

MOTION: That a temporary committee be appointed to look into long-term management of Society Funds. Shemanchuk/Jones. CARRIED.

MOTION: That the original motion be TABLED. Ball/Jones.

Insect Collection Contest (temporary) Committee: Robin Leech reported that the committee will look into ways to encourage participation. One of the problems was that since the Annual Meeting took place shortly after students went back to school, there was not enough time to complete a collection. The committee will stand for another year. MOTION: That the report be accepted. McClay/Spence. CARRIED.

John Spence reported that several schools were not allowing their students to bring in insect collections as it was considered unethical to kill insects. Rick Butts mentioned that similar problems were being encountered at Science Fairs. MOTION: That the school and Science Fair policies regarding use of insects by students in schools and Science Fairs be brought to the attention of the ESC by the ESA Regional Director. Spence/Ball. CARRIED.

**Insect Collector's Guide Committee (temporary):** Pat Scholefield presented his report and results of the insect guide questionnaire. There were only 8 responses to 200 questionnaires mailed out. There was unanimous feeling that the guide be updated. Several thought that there should be two guides, one for junior collectors and another for more senior collectors. **MOTION:** That the Insect Collector's Guide be revised and that a manuscript be produced for the next annual meeting. Leech/Evans. **CARRIED.**

**Public Awareness (temporary) Committee:** Alec McClay reported that the committee was looking into the possibility of a Newsletter, news releases, prizes at Science Fairs and student members at the executive as means of increasing public awareness of our Society. Members with suggestions are asked to contact either Alec McClay or Rick Butts. A final report will be prepared in 1992. **MOTION:** That the report be accepted. McClay/Spence. **CARRIED.**

**Society Refereed Journal/Proceedings (temporary) Committee:** Dave Langor reported that before appointing members to this committee he wanted to open up the question among the members first. He indicated that there was a need to establish what market such a publication would have and if members would be willing to contribute good papers to such a publication. Discussion followed. **MOTION:** The Society not proceed with a Refereed Journal/Proceedings Committee. Pritchard/Dolinski. **CARRIED.**

**Profiles of Alberta Entomologists.** The invoice for this was paid in 1991.

**Other busines:** None.

**Report of the 1991 Annual Meeting Organizing Committee:** Rick Butts reported that we had 61 registrants and 85 people at the banquet. The committee expected that the net loss of the meeting would not exceed \$200.00. **MOTION:** That the report be accepted. Butts/McClay. **CARRIED.**

#### **Report of Officers**

**Treasurer's Report.** Daryl Williams circulated the interim treasurer's report. **MOTION:** That the treasurer's report be accepted. Williams/Thormin. **CARRIED.**

**Secretary's Report.** Mark Goettel presented a brief verbal summary. **MOTION.** That the report be accepted. Goettel/McClay. **CARRIED.**

**Editor's Report.** George Evans reported that he is still awaiting an audited financial report and photographs before he can proceed with publication of the 1990 Proceedings. He hopes to have them published by February. He noted that in the future, every effort be made so that the Proceedings be published before the next meeting. **MOTION:** That the report be accepted. Evans/Shemanchuk. **CARRIED.**

**Auditor's Report.** Mike Dolinski reported that the audit of 1990 books was in progress. Revenue in the amount of \$426.00 can't be found from last year's joint meeting. The organizing committee will be contacted in order to clarify this apparent discrepancy. MOTION: That the report be accepted. Dolinski/Leech. CARRIED.

**Regional Director's Report.** Alec McClay reported that the Entomological Society of Canada had purchased a house in Ottawa, that the Canadian Entomologist was now being published bimonthly, that the ESC put up \$1,000 to be matched by government to increase public awareness and that the next governing board meeting was October 19. MOTION: That the report be accepted. McClay/Jones. CARRIED.

**President's Report.** Dave Langor reported that his tenure as president was both enlightening and enjoyable. He reviewed some of the Society's activities during the past year. MOTION: That the report be accepted. Langor/Leech. CARRIED.

#### Reports of Standing Committees

**Awards Committee.** Bert Schaber reported that one name was submitted for the Gordon Hewitt Award and that no nominations were received for the U of A Prize. MOTION: That the report be accepted. Schaber/Spence. CARRIED.

**Insect Collection Committee.** On behalf of Ted Pike, Jack Zloty proposed that a book prize be awarded to David McCauley from Barrhead. There was only one entry. MOTION: That the report be accepted. Zloty/Leech. CARRIED.

**Representative to the Environmental Council of Alberta.** Joe Shemanchuk reported that the Council was being reorganized with the appointment of Natalie Kravitz as the new chief executive and that a new report would be out shortly. The ESA no longer has a role in the ECA. MOTION: That the report be accepted. Shemanchuk/Spence. CARRIED.

**Membership Committee.** No report.

**Science Fair Liason Committee.** John Spence reported that steps are being taken in an attempt to provide a book prize for the Edmonton Regional Science Fair. MOTION: That the report be accepted. Spence/Leech. CARRIED.

#### Resolutions Committee

MOTION: Whereas, the Organizing Committee provided one of the largest and most interesting programs in recent years,

be it resolved that the membership of the Society thank Rick Butts, Bert Schaber and Tim Lysyk.

Whereas, the remarks of Charlie Zinkan made all participants feel most welcome to the fall splendors of Waterton National Park,

be it resolved that the Society send him a letter of appreciation.

Whereas, the success of the meeting depends on an interesting theme,

be it resolved that the membership thank R.J. Lamb for a most enlightening talk on crop resistance to pests.



Whereas, the candence and flow of any meeting depends on efficient chairpersons for their regulation,

be it resolved that the Society offer thanks for a sterling job to Rick Butts, Gordon

Pritchard, Alec McClay, David Langor.

Whereas the post-banquet presentation "Sacred Places, Sacred Spaces" did much to raise awareness of the importance of personal vision quests,

be it resolved that the membership send a letter of thanks to Dr. J. Dormaar for his slide presentation.

Whereas a photographic record of the meeting is necessary in maintaining a historical record of the Entomological Society of Alberta,

be it resolved that the membership thank Robin Leech for making a nuisance of himself.

Whereas suitable facilities, accommodations and banquet were provided by the Bayshore Inn,

be it resolved that a letter of thanks be sent to the management and staff.

Whereas John Spence, his colleagues, students and minions dominated the seminars with their Spencian theories,

be it resolved that there be no waterstrider talks at next year's meeting (well, maybe one...).

## New Business

### Election of Officers - Nomination Committee

John Spence presented the following slate:

|                       |                |
|-----------------------|----------------|
| President.....        | John Spence    |
| Vice President.....   | Rick Butts     |
| Secretary.....        | Mark Goettel   |
| Treasurer.....        | Daryl Williams |
| Director (south)..... | Tim Lysyk      |
| Editor.....           | George Evans   |

MOTION: That nominations cease.

Ball/McClay. CARRIED.

As there were no other nominations, the slate was declared elected. Spence/Ball. CARRIED.

### Duties of Officers and Council Members of the ESA.

Dave Langor will come up with a list in order to help new officers.

### 1992 Annual Meeting

Dave Langor announced that Jasper has been chosen as the venue for our next meetings.

### Adjournment

The meeting adjourned at 1:35 p.m. on a motion by Robin Leech.

# Entomological Society of Alberta

## Year Ending Financial Statement to December 31, 1991

|                              |         |
|------------------------------|---------|
| Bank assets, January 1, 1991 | 4262.21 |
|------------------------------|---------|

### CREDITS

#### MEMBERSHIPS

|                    |                   |             |        |
|--------------------|-------------------|-------------|--------|
| Regular            | 1992 2 @ \$10.00  | 20.00       |        |
|                    | 1991 13 @ \$10.00 | 130.00      |        |
|                    | 1990 2 @ \$10.00  | 20.00       |        |
|                    | 1989 1 @ \$10.00  | 10.00       |        |
| Student            | 1991 3 @ \$ 5.00  | 15.00       |        |
| Currency exchange  |                   | <u>1.45</u> |        |
| Total memberships  |                   | 196.45      |        |
| Deposits on record |                   | 196.45      | 196.45 |

#### INTERESTS

|                        |             |        |
|------------------------|-------------|--------|
| Term Deposit Interest  | 166.44      |        |
| Common shares dividend | <u>4.95</u> |        |
| Total Interest         | 171.39      | 171.39 |

#### ANNUAL MEETINGS

|                                                                                                |                      |                  |
|------------------------------------------------------------------------------------------------|----------------------|------------------|
| Income from 1990 joint Entomological Society<br>Canada/Alberta at Banff Centre                 | 13,238.71            |                  |
| 1991 Annual meetings, Entomological<br>Society of Alberta, - see separate financial statement. |                      |                  |
| Total Income, annual meetings                                                                  |                      | <u>13,238.71</u> |
|                                                                                                | <b>Total Credits</b> | <b>17,868.76</b> |

**EXPENDITURES****ANNUAL MEETINGS**

|                                                              |                 |        |
|--------------------------------------------------------------|-----------------|--------|
| Deposit for facilities,<br>Bayshore Inn, Waterton Lakes N.P. | \$200.00        |        |
| Travel expenses, Keynote Speaker                             | <u>\$280.00</u> |        |
|                                                              | \$480.00        | 480.00 |

**PUBLICATION COSTS**

|                                                                    |           |         |
|--------------------------------------------------------------------|-----------|---------|
| Entomological Society of Canada,<br>for 'Entomologists of Alberta' | \$1840.37 | 1840.37 |
|--------------------------------------------------------------------|-----------|---------|

**MISCELLANEOUS**

|                           |                |                |
|---------------------------|----------------|----------------|
| Photocopy Charges         | \$17.35        |                |
| Receipt Book              | \$5.94         |                |
| Bank Charges              | <u>\$16.81</u> |                |
|                           | \$40.10        | <u>40.10</u>   |
| <b>Total Expenditures</b> |                | <b>2338.47</b> |

**Balance Summary**

|               |                    |
|---------------|--------------------|
| Total Credits | \$17,868.76        |
| Total Debits  | <u>\$ 2,338.47</u> |
| Balance       | \$15,530.29        |

Bank Assets on December 31, 1991 \$15,530.29

Financial Statement  
1991 Annual Meetings  
Waterton Lakes National Park

**CREDITS**

## Collected by Organizers

|                            |               |          |
|----------------------------|---------------|----------|
| 61 Registrations @ \$35.00 | 2,135.00      |          |
| 23 Accompanying @ \$15.00  | <u>345.00</u> |          |
|                            | 2,480.00      | 2,480.00 |

## Forwarded by ESA Treasurer

|                                  |                 |        |
|----------------------------------|-----------------|--------|
| Advance on deposit, Bayshore Inn | \$200.00        |        |
| Airfare for Keynote Speaker      | <u>\$258.00</u> |        |
|                                  | \$458.00        | 458.00 |

**Total Credits** 2938.00

**EXPENDITURES**

## Hotel Expenditures

|                                  |                  |         |
|----------------------------------|------------------|---------|
| Cheese Trays                     | \$ 101.25        |         |
| Wine - 29 litres @ \$14.00 ea.   | \$ 406.00        |         |
| Banquet - 84 persons @ 12.75 ea. | \$ 1071.00       |         |
| Coffee - 21 pots @ 7.50 ea.      | \$ 157.50        |         |
| Gratuities                       | \$ 260.36        |         |
| G.S.T.                           | <u>\$ 121.50</u> |         |
|                                  | \$2117.61        | 2117.61 |

|                                   |                       |                 |
|-----------------------------------|-----------------------|-----------------|
| Guest Honorarium                  | \$100.00              |                 |
| Stationary                        | \$58.63               |                 |
| NSF cheque and service charges    | \$10.35               |                 |
| Accommodation for Keynote Speaker | \$175.82              |                 |
| Airfare for Keynote Speaker       | <u>\$258.00</u>       |                 |
|                                   | \$602.80              | 602.80          |
|                                   | <b>Total Expenses</b> | <b>2,720.41</b> |

#### **Balance Summary**

|                    |                   |
|--------------------|-------------------|
| Total Credits      | \$2,938.00        |
| Total Expenditures | <u>\$2,720.41</u> |
| Net Income         | \$217.59          |

Of the Net Income, \$190.00 were collected by the Treasurer and deposited directly into ESA accounts. The remaining \$27.59 was forwarded to the Treasurer at a later date. Both amounts were deposited after January 1, 1992 and will appear in the 1992 interim and final financial statements.

Note to Auditors. Reports for the 1991 annual meetings are recorded separately, since most financial transactions were enacted by the members of the organizing committee. Committee members T. Lysyk and R. Butts have compiled their own final financial report for these meetings, included separately in the package of receipts. Note that no receipts were obtained by members of the Meetings organizing committee for the \$100.00 Guest Honorarium or the \$10.35 bank service fees. The Treasurers report has been re-organized to reflect receipts in possession and to reconcile with other financial transactions of the society but otherwise faithfully reflects the committees' report.

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technical merit and display

**The collection may consist of** : specific insects ( i.e. butterflies,  
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