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Edmonton, Alberta October 4-8 1997

CONTENTS

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 certification 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) entomoloigsts at the Science Service Laboratories in Lethbridge (now an Agriculture and Agri-Food Canada research station), Suffield Research Station, the 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 vigour. The objectives of the Society are succinctly stated in the original Constitution, which differs only slightly from the present 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."

OFFICERS 1997

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SCIENTIFIC PROGRAM FOR 1997 JOINT ANNUAL MEETINGS

47th Meeting of The Entomological Society of Canada
45th Meeting of The Entomological Society of Alberta

Sunday, October 5

W1 Workshop: Forest insect defoliators and *Bt*: a system of multiple-trophic interactions
W2 Workshop: Biological control of pests of field crops
L1 Plenary Lecture (G. Scudder): Insects: diversity, impacts and adaptations

Monday, October 6

L2 Gold Medal Award and Address (P. Harris): The evolution of classical weed biocontrol in Canada
S1 Symposium: Forest biodiversity: what's next?
P1 President's Prize I: Chemical ecology and reproduction
P2 President's Prize II: Biodiversity
P3 President's Prize III: Pest management
W3 Workshop: *Lygus* bug management
O1 Poster Session
L3 Heritage Lecture (G. Ball): Pursuit of insect biodiversity, Canadian style
W4 Workshop: Communicating Entomology
Teaching breakout session
Extension breakout session

Tuesday, October 7

S2 Symposium: Insects and ecosystem productivity
C1 Contributed Papers: Forest entomology
C2 Contributed Papers: Agricultural entomology
C3 Contributed papers: Systematic entomology
S3 Symposium: Pollinators and mother earth: global perspectives in productivity, diversity, and behaviour

Wednesday, October 8

S4 Symposium: Fluctuating asymmetry
C5 Contributed Papers: Forest entomology
C6 Contributed Papers: Conservation, host plant resistance
C7 Contributed Papers: Insects natural history
C8 Contributed Papers: Agricultural Entomology

PRESIDENT'S REPORT
(W. Jan A. Volney)

The joint meeting of the Entomological Society of Canada and our own Society commanded the attention of the Society this year. My job was made easy by the excellent work of the organizing committee.

I wish to formally recognize and thank each member of that committee for, without exception, they did an outstanding job. The General Chair was Bruce Hemming ably assisted by the Local Arrangements Chair: David Langor. Advertising and communications to the public were handled by Andrew Keddie. Accommodations for the meeting were arranged through Bev Mitchell and Kay Ball organized an entertaining associates program. Banquets and receptions were the purview of Jens Roland and Robin Leach created a photographic record of the event. The business of the meeting was handled by an effective Fund Raising Chairman, Mike Dolinsky; an assiduous Registration Chair, Greg Pohl and a Treasurer, Jim Ryan, that kept us focused on the bottom line. The meeting presenters had the good fortune of having excellent audio-visual aids arranged by James Brandt. Printing and the final production of the program was arranged by Daryl Williams. The scientific program benefited largely from the success of John Spence in organizing symposia chairs, arranging speakers for one symposium, recruiting the Plenary Lecturer and assisting in compiling the contributed items in the program. I take full responsibility for any errors that occurred in the printed program.

Special mention goes to Dr. George Ball for providing the Heritage Lecture. I found this a stimulating perspective on the history of entomological pursuits and their impediments in Canada. Jack Scott's design for the logo of the meeting will long be remembered. The several contributions of Society members to the scientific program contributed to its success. On a lighter note, who could forget Bruce Hemming's introduction of John Acorn and John's performance at the Banquet?

Many others contributed to the success of the meeting. The moderators of the various sessions were often executive committee members or former members. The several students that assisted with the projectors: Andrea Durand, Louis Morneau, João Sousa, Kamal Gandhi, Christel Leonhard, Rosalind Barrington-Leigh, Chris Buddle, Jennifer Hiebert, Charity Brière, and though technically not a student, Karen Cryer, often go unmentioned in these encomia. I also wish to thank the staff of the hotel, Crowne Plaza/Chateau Lacombe, for the excellent service and accommodations they provided the meeting.

We have conveyed our thanks to the several sponsors, recognized in the program, for their generous contributions which made the meeting a financial success.

Financially and scientifically your society is in excellent shape because of the signal contributions of all its members. The future lies in the students and recent recruits to the Society and the example you have provided in conducting the Society's affairs over the past year. I sincerely thank you for your help.

ABSTRACT OF KEYNOTE SPEAKER

Insects: diversity, adaptation and impact

Geoffrey G. E. Scudder
Department of Zoology, University of British Columbia

The world belongs to the insects. I will demonstrate this by considering their diversity, adaptation and impact.

Insects have dominated the earth for at least 300 million years. Their interactions with plants made our existence possible. Without them we would die.

Estimates of the total number of insect species in the world today varies from 5 to 30 million, with 12.5 million being a reasonable mean. Some 65% of all the living species are insects, constituting about 81% of the animal world. This immense diversity in numbers is matched by an equal diversity in form, function and way of life. Their innumerable and at times bizarre adaptations, provide some of the finest examples of perfection in animals. Their design innovations provide an ever amazing challenge to our modern high-tech biologists, chemists and physicists.

Their eclectic tastes, habits and behaviours, may appear strange, but always guarantee their survival. Their essential roles in ecosystem functions and services are rarely recognized, but they have an enormous impact on our life and economy.

Obvious beneficial insects may appear to be a minority. Too often we focus most on the pests and the diseases they may transmit. We rarely question how humans have impacted their world. Insects are survivors. They have proven this for millions of years. They will overcome the human ecological footprint, and will always be able to evolutionarily, outsmart us. They would not notice if we disappeared, but we cannot exist without them.

ABSTRACTS OF PAPERS FROM ESA MEMBERS

Note: Abstracts of presentations with an ESA member are presented in alphabetical order by author. Titles and dates of paper sessions are listed in the science program on page #. Addresses of presenters that are ESA members are located in the membership list on page #. Addresses of non-member co-authors are listed below.

Barrington-Leigh, R.H. P4 President's Prize: "Impacts of a eugregarine on the life history of *Gerris beunoi* (Hemiptera:Gerridae)."
A eugregarine found in the alimentary canal of the water strider *Gerris buenoi* shows variation in prevalence across both time and location. I will discuss the impacts of gregarine infection on several life history parameters of *G. buenoi.* These results will be discussed in the context of the host's population structure.

Battigelli, J.P. Winner of P2 President's Prize: "Oribatid mite fauna of central B.C.: Impact of harvesting and soil compaction on abundance and diversity."
Oribatid mites are abundant in forest soils and important in decomposition and nutrient cycling. Fauna of the Sub-Boreal Spruce biogeoclimatic zone in central British Columbia was surveyed for the first time 1 year before and after tree-harvesting and soil compaction treatments. Treatments significantly reduced oribatid abundance and diversity.

Bjornson, S. C8 Contributed paper: "Rebels with a cause."
Recent reports of microsporidea in predatory mites *Amblyseius cucumeris*, *A. barkeri*, and *Phytoseiulus persimilis* have raised doubts regarding quality of mass-reared natural enemies. Concerns regarding performance have resulted in quality control recommendations for more than 20 greenhouse biological control agents. Although proposed tests are designed to ensure minimum performance standards are achieved, current recommendations do not consider effects that pathogens may have on performance of natural enemies; nor do current quality control recommendations promote routine examination for potential pathogens. Without consideration of pathogens and their effects on biological control agents, it remains uncertain if recommended performance parameters are reliable indicators of quality.

Buddle, C. P2 President's Prize: "Spider diversity and abundance in aspen-mixedwood stands originating from harvest and wildfire"
Spiders were sampled using pitfall traps placed in aspen-mixedwood stands varying in age and origin (wildfire and harvest). 2410 spiders from 11 families and 79 species were identified from the first year of study. Results suggest spider assemblages in harvest stands come to resemble the fauna from wildfire stands after 30 years of forest growth.

Butts, R.A. W3 Workshop: *Lygus* research on canola. Abstract was not submitted.

Butts, R.A., R. DeClerck-Floate, and B Wikeem. C8 Contributed paper: "Cold tolerance of *Mecinus jianthinus*, a weed biological control agent released in Canada for the control of Dalmatian Toadflax."
Mecinus jianthinus adults were collected for Dalmatian toadflax stalks. Laboratory experiments were conducted to determine the cold tolerance of field collected adults. Adult tolerance to acute and long-term exposure to low temperatures were investigated. These data were then compared to actual mortality in the field.

Cooke, B. and J. Regniere (Canadian Forest Service, Quebec). W1 Worskshop: Interactions between *Bt* and budworm parasitoids: optimization through modeling.
Abstract was not submitted.

Cooke, B. C5 Contributed paper: "The effect of forest structure on recruitment in the forest tent caterpillar."
Forest tent caterpillar outbreaks last longer in fragmented forests. This could be due to greater recruitment in fragmented forests. Three components of recruitment (net migration, fecundity, egg-hatch) were measured over 120 plots and two years and analyzed for density-dependence and landscape effects. Mechanisms and implications for large-scale dynamics will be discussed.

Danyk, T., D. Johnson, and M. Goettel. P3 President's Prize: "Effects on survival and reproduction in the grasshopper parasitoid, *Blaesoxipha atlanis,* following exposure to surfaces treated with the entomopathogen, *Beauveria bassiana.*"
The pathogenicity of *Beauveria bassiana* to adults of the grasshopper (Orthoptera: Acrididae) parasitoid, *Blaesoxipha atlanis* (Diptera: Sarcophagidae), was evaluated using conidial suspensions of known concentrations that were applied to artificial surfaces. LT_{50} and probability of survival to reproductive age declined as dose increased. Results are discussed with respect to IPM on the prairies.

DeClerck-Floate, R. O1 Poster session: " Biology and biocontrol potential of *Platyprepia virginalis* (Lepidoptera: Arctiidae) on hound's-tongue in British Columbia."
The native moth, *Platyprepia virginalis* (Bvd.) was found feeding on the introduced rangeland weed, hound's-tongue (*Cynoglossum officinale* L.) in B.C. Overwintered larvae occur on rosettes in April. Pupation occurs in May and adults emerge in June. Initial host specificity tests, using 14 plant species, representing 6 families, indicate the moth can complete development on 8 species in the families Boraginaceae, Asteraceae, Fabaceae and Gramineae. The greatest number of adults were produced on hound's-tongue and the closely-related borage.

Dosdall, L.M., P.M. Conway, N.T. Cowle (Alberta Research Council, Bag 4000, Vegreville, AB, T9C 1T4). C2 Contributed paper: " Reduced tillage affects insect pests of Canola."
Root maggots (*Delia* spp.) and flea beetles (*Phyllotreta* spp.) responded differently to changes in canola tillage regime. Root maggot infestations increased with zero tillage, but flea beetle populations were greatest in conventional tillage systems. Root maggot infestations declined with higher seeding rates and wider row spacings, but flea beetles were unaffected by these parameters.

Dosdall, L., P. Mason, M. Goettel, and M.A. Erlandson. Agriculture and Agri-Food Canada, Saskatoon). W2 Workshop: "Microbial control of grasshoppers."
Grasshoppers are susceptible to a wide spectrum of pathogens including fungi, protozoa, viruses, rickettsia and bacteria. However, only the fungi, entomopoxviruses, and protozoa have been or are being developed as microbial control agents of grasshoppers. Although the microsporidian *Nosema locustae* has been commercially available in the United States for many years, its utility as a microbial control agent of grasshoppers remains questionable. Although significant impacts of *Nosema* spp. on grasshopper survival, development, reproduction and feeding have been demonstrated, this protozoan has not met the requirements for a fast-acting, efficaceous agent as is often required in field crop situations. Entomopoxviruses are the only DNA viruses that have been found to occur naturally in grasshopper populations. They are relatively host specific, virulent, persistent and are naturally disseminated, however more efficient and economical methods of mass production must be developed. The most common fungi that are pathogenic to grasshoppers are *Beauveria bassiana*, *Metarhizium anisopliae, M. flavoviride* and fungi in the *Entomophaga grylli* complex. Species in the *E. grylli* complex are being used in classical control. *B. bassiana* and *M. flavoviride* are being developed for inundative control. In laboratory experiments simulating grasshopper thermoregulation during daylight periods, application of both *M. flavoviride* and *B. bassiana* simultaneously resulted in a final prevalence of disease

that was greater than *M. flavoviride* alone in the hot environment, and equal to *B. bassiana* alone in the cool temperature environment, suggesting that pathogen combinations may provide better efficacy in field applications. *B. bassiana* has been registered against grasshoppers in the United States, but is still not commercially available for use against this pest. It is expected that *M. flavoviride* will soon be registered in Africa for use against grasshoppers and locusts.

Durand, A. P4 President's Prize: " Can forest tent caterpillars improve leaf quality of trembling aspen and alter its shoot architecture?"
Forest tent caterpillars (*Malacosoma disstria* Hübner) emerge in early spring mining buds and/or consuming new leaves growing on apical parts of branches. This feeding pattern may improve host quality through induced amelioration (IA). I tested whether IA occurs in trembling aspen (*Populus tremuloides* Michaux) following the removal of 25% of the active buds in the spring. I also determined how shoot architecture changes following bud removal.

Erlandson, M. (Agriculture and Agri-Food Canada, Saskatoon) and L. Braun. W2 Workshop: "Microbial control of lepidopteran pests of canola."
Bertha armyworm populations are regulated to a degree by a number of native parasites and microbial diseases including a baculovirus (*Mamestra configurata* nucleopolyhedrovirus {MacoNPV}) and an entomophthoran fungus. Of these two microbial pathogens the baculovirus, MacoNPV, has the best potential as a microbial insecticide. Baculoviruses are a group of DNA viruses specific for invertebrate hosts and are characterized by a unique replication cycle in which two forms of virus are produced. There are a number of baculoviruses currently registered for insect control in a variety of forestry and agricultural situations. Baculoviruses are seen as having good potential as safe biological control agents because of their host specificity, virulence, stable packaging of virions in proteinaceous occlusion bodies and the potential of genetic engineering to enhance virulence. Some of our work assessing MacoNPV as a potential biocontrol agent including biological and molecular characterization of geographic isolates of MacoNPV and preliminary field-cage trial assessments against BAW larvae will be reviewed. The use of baculoviruses as either inundative microbial pesticides or in an augmentation strategy in a more *classical-type* approach will require innovative techniques for delivering infectious virus to the target host in an efficient and timely manner. Some preliminary work with formulation additives, UV protectants and possible synergist will be summarized. Issues surrounding the efficient production of baculoviruses will also be addressed.
Bacillus thuringiensis has by far the largest market share of any microbial based insecticidal product. It is debated by some as to whether use of *Bt* constitutes biological control however it is with-out question a biologically derived product and its interaction with insects is often more complex than a simple toxicant (*Bt* δ-endotoxin) - insect target interaction. *Bacillus thuringiensis* var. *kurstaki* strains form the basis of commercial products such as Dipel. These products have proved to be effective for a relatively wide spectrum of lepidopteran pest species including diamondback moth. However, resistance development has already occurred in some diamondback populations and some of the information regarding *Bt* δ - endotoxin specificity and resistance management strategies will be addressed. To date none of the commercial formulations of *Bt* have been shown to be active against BAW. Bertha armyworm responses to *Bt* resembles that of *Spodoptera* and other *Mamestra* species in that mortality occurs only with relatively high dose rates but inhibition of feeding and significant

delays in development can be demonstrated.
What role either baculoviruses or Bt may play in the management of lepidopteran pests of canola remains to be resolved.

Floate, K.D. S4 Symposium presentation: "A test of fluctuating asymmetry as a bioindicator of environmental quality."
Random departures from bilateral symmetry (i.e. fluctuating asymmetry) are associated with increased stress during development and may reflect levels of chemical contamination in the environment. Tests of this proposal using house flies exposed to ivermectin during egg to adult development failed to show any effect of this pesticide on fly FA, and failed to show any relationship between levels of FA and the fitness of fly populations.

Fownes, S. P4 President's Prize: "*Parnassius smintheus*, a butterfly that does not oviposit on its larval host plant, *Sedum lanceolatum*."
Adult female oviposition site selection is a crucial step in the completion of butterfly life cycles, particularly for species with monophagous larvae. *Parnassius smintheus* do not oviposit on their larval host plant, *Sedum lanceolatum*. Rather upon hatching larvae must locate their host. I examined adult female behavioral response to *Sedum lanceolatum* and the resultant effect on oviposition events off of the host plant.

Gandhi, K. P2 President's Prize: "Fire-skips as biotic storehouses for old-growth beetle specialists in pyrogenic forest stands of western Alberta."
Unharvested forests are mosaics of forest types and age classes maintained by natural disturbances such as wildfire. As forest ecosystem management is moving to embrace a paradigm, under which critical aspects of fire, such as landscape pattern, are maintained along with sustainable rates of fiber extraction, a thorough understanding of natural patterns of biota is essential for judging the success of this new approach. Fire-skips (unburned residual forest within the burn area) are thought to play a role in preserving old-growth faunal species from which burned areas may be recolonized. I, therefore, aim to determine: 1) whether fire-skips and old-growth forest act as faunal storehouses for old-growth beetle specialists; 2) how size, isolation and habitat heterogeneity of a skip affect the storehouse capacity for retention of old-growth beetle specialists; and 3) the extent to which edge effects constrain the size of fire-skips. The results will provide a "natural disturbance" baseline against which appropriate ecosystem management strategies can be developed for pyrogenic forest stands of Alberta.

Hammond, H.E.J. C6 Contributed paper: "Rare beetles and natural disturbance: conservation implications of boreal forestry."
Carabid, staphylinid and saproxylic beetles were sampled from a chronosequence of fire- and harvest-origin boreal mixed-wood stands in north-central Alberta using pitfall traps and window traps. Although the fauna from harvested stands converged on that of pyrogenic stands rapidly, a number of early successional species were absent or rare in harvested stands. These species, in addition to any old growth specialists, might be at risk in forestry dominated landscapes.

Hindmarch T.D. C4 Contributed paper: "Effects of forest structure on pine engraver bark beetles."
Marked pine engraver bark beetles were released and recaptured in thinned and unthinned lodgepole pine stands. Fat content of recaptured females declined with distance in unthinned stands, whereas males did not experience a change in fat content in either type of stand. The reproductive strategies of females may therefore be determined by forest structure.

Hodnett, K. and M. Reid. C4 Contributed paper: " Settlement strategies of bark beetles."
This study examines the progressive settlement patterns of populations of bark beetles (Scolytidae) on host trees. Initial settlement distributions tend to be aggregated. Decisions affecting an individual's placement of a nuptial chamber in relation to its own characteristics and those of surrounding inhabitants are considered.

Johnson, D. C8 Contributed paper: In harm's way: chemical modification of target behaviour to increase the effectiveness of microbial control of grasshoppers and locusts.
The tendency of grasshoppers to bask impedes efficacy of fungal control agents (*Beauveria bassiana*). Modification of the insect behavior could place the target in microclimates more favourable to mycosis. Spinosyn (from an actinomycete, DowElanco Inc.) provided incapacitation of two-striped grasshoppers (ED_{50} < 1.0 µg/g, 4th instars, 2.4, 5th instars; ED_{95} 7.5, 5th instars). Deltamethrin (AgrEvo Inc.) and cyhalothrin-lambda (Zeneca Corp.) caused incapacitation and cryptic behavior at low doses.

Justus, K.A. P1 President's Prize: "Antennae of *Plutella xylostella* (L.): a new modality."
Insect antennae are thought to function primarily as olfactory organs. Ovipositing diamondback moths, *Plutella xylostella* (L.), exhibit behaviours that suggest that these antennae possess sensilla other than olfactory. Electrophysiological and scanning electron microscopical evidence support this suggestion. It is believed that these sensory hairs are gustatory in nature play an important role in oviposition site detection.

Klingenberg, C.P. S4 Symposium presentation: "Making the straight crooked: an experimental study of asymmetry."
The developmental mechanisms influencing left-right asymmetry are largely unknown. Here I report on an experiment in the buckeye butterfly *Precis coenia* (Lepidoptera: Nymphalidae). Asymmetry was generated by removing wing imaginal discs from growing caterpillars, causing significant asymmetry in other imaginal structures. This experiment suggests hemolymph-borne interactions among growing tissues, perhaps through competition for a limiting resource.

Langor, D.W., G.R. Pohl, H.E.J. Hammond and J.R Spence. O1 Poster Session: "Regional variation in epigaeic beetle assemblages. "
Epigaeic beetles (Carabidae, Staphylinidae) were sampled in mature aspen stands in six regions of Alberta. There were little regional differences in abundance and species richness. Of the 113 species collected, only 29 were found in all regions, but these comprised 89% of the total catch. Regional differences were evident in faunal composition. Western and

northern regions contained distinct montane and northern faunal elements. Development of ecological conservation strategies requires sensitivity to regional variation in biotic composition.

Lucas, R.A., J.R. Spence, W.J.A. Volney, and K.I. Mallett (Canadian Forest Service, Northern Forestry Centre) and D.G. Maynard (Canadian Forest Service, Pacific Forestry Centre, 506 W. Burnside Rd., Victoria, BC, V8Z 1M5). O1 Poster session: "Influence of defoliation by the forest tent caterpillar, *Malacosoma disstria*, upon forest health, productivity and carbon allocation in aspen stands."
Stands have been selected to represent the range of biophysical conditions under which aspen grows in Alberta. A combination of tree mensuration, health surveys and whole tree harvesting are being used to determine how historical defoliation events have influenced current biomass, productivity and forest health conditions.

McClay, A;. R. DeClerck-Floate, H. Hinze[1], R. Sobhian[2] and S. Hasan[2]. W2 Workshop: Classical biological control of weeds in field crops
Classical biocontrol of weeds has always been considered difficult in field crops, where cultivation, harvesting, crop rotation, and pesticide application may hinder the establishment of biocontrol agents. A further constraint is that agents must suppress the weeds before they grow large enough to reduce crop yields. There are two possible approaches to using biological control against field crop weeds. One is to target areas which act as reservoirs of weeds outside the crop, with the goal of reducing the source of seeds for future crop infestations. The second is to use an agent which is damaging enough to directly limit weed growth in-crop. Two examples from our current research will be discussed. Scentless chamomile (*Matricaria perforata*) is an annual or winter annual weed which has been introduced from Europe into the Canadian prairies, where it forms dense infestations along field and slough margins, rights-of-way, and in urban and industrial areas. The plant is a prolific seed producer which can quickly invade cropland, causing significant yield losses. A European seed-feeding weevil, *Apion hookeri*, has been released and established at sites across the Canadian prairies, and has potential for reducing the plant's seed output. A stem-boring weevil, *Microplontus edentulus*, has recently been approved for release in Canada, and is currently being reared at the Alberta Research Council in Vegreville. Testing has been completed on a gall midge, *Rhopalomyia* n. sp., which attacks the buds and growing points of scentless chamomile. It is hoped that the combined attack of these three agents, possibly with others, will reduce the spread of scentless chamomile from reservoir populations into cropland. False cleavers (*Galium spurium*) is an annual weed which is increasing in canola and other field crops on the Canadian prairies. We are studying a European gall mite, *Cecidophyes galii*, which causes leaf rolling on false cleavers. Results to date indicate that it is highly specific, infests its host rapidly, and can kill or significantly reduce the growth of cleavers plants. If this agent is approved for field release in Canada, it may be sufficiently damaging to provide direct in-crop control of cleavers.
[1]International Institute of Biological Control, 1, Chemin des Grillons, CH-2800 Delémont, Switzerland
[2]USDA-ARS European Biological Control Laboratory, 34397 Montpellier Cedex 5, France

McIntyre, G.S. S4 Symposium presentation: "Several takes on the effects maternal age on fluctuating asymmetry."
Four methods for analyzing fluctuating asymmetry are compared 1) linear measurements, 2) Procrustes analysis (multivariate technique for landmark data), 3) graphical analysis of landmark data, and 4) image analysis. The data sets examined were collected to determine if maternal age affects offspring wing symmetry in tsetse and house flies.

Otani, J.K. and Butts, R.A. P1 President's Prize: "*Lygus* reproduction in relation to canola (*Brassica napus*) crop phenology."
This study was conducted to determine if *L. elisus* immigrates to canola in southern Alberta in response to crop phenology or to fulfill the reproductive requirements of the insect. A field and laboratory component was designed to examine *L. elisus* egg development and mating status in relation to canola phenology.

Ranasinghe, S.K. and H. Ono. C5 Contributed paper: "Aerial spraying to manage eastern spruce budworm infestations in Alberta, 1990-1996."
In 1989, for the first time, the Land and Forest Service began aerial spraying to manage eastern spruce budworm outbreaks. Initial attempts in Alberta to protect current year's foliage by aerial spraying were unsuccessful. This paper reviews the changes made to the spray program with emphasis on population suppression in view of the host characteristics and budworm phenology in Alberta.

Reid, M.L.. C4 Contributed papers: "Causes and consequences of breeding aggregations in pine engraver bark beetles."
In natural breeding aggregations of pine engravers, *Ips pini* (Scolytidae), individuals settling in low density aggregations attracted more mates. Body size of settlers also declined as aggregation density increased. Thus, aggregations in pine engravers appear to be detrimental to individuals, and only accepted by small individuals with low dispersal prospects.

Reid, M.L. and K. Price (Biological Sciences, U. Calgary). S4 Symposium presentation: "Size and asymmetry of sexually dimorphic spines in pine engravers: effects on male fitness."
In *Ips* (Scolytidae), males have a relatively enlarged pair of declivital spines. Larger males had longer and more bulbous spines than did smaller males, and longer spines were more symmetrical. Only spine length appeared to affect male mating success. There was no correlation between spine attributes and habitat choice.

Roland, J., N. Keyghobadi (Biological Sciences, U. Alberta), and S. Fownes. C6 Contributed paper: "Butterfly dispersal among shrinking alpine meadows."
Mark-recapture studies in 1995 and 1996 in Kananaskis, Alberta, assessed the effect of alpine meadow isolation on dispersal of *Parnassius smintheus* butterflies among 26 meadows. Butterflies disperse readily through meadow habitat, but intervening forest is a major barrier to dispersal. Statistical models of the effect of landscape on dispersal, combined with aerial photographs from 1952, indicate that, because of rapidly rising treeline, present day dispersal is severely reduced from that of only five decades ago.

Sargent, R.D. and M.L. Reid. C7 Contributed paper: "Sex ratio manipulation in pine engravers: size isn't everything."
Offspring sex ratios in pine engravers (*Ips pini*) were predicted to be male biased in good rearing conditions because males are the larger sex. Contrary to expectation, sex ratios were female biased in conditions that favoured large body size, such as good quality trees and the beginning of egg galleries.

Sousa, J.M. P4 President's Prize: "*T.g.* or not *T.g.*? That is the question: re-examining *Tiphodytes gerriphagus* larvae."
Tiphodytes gerriphagus (Hymenoptera: Scelionidae) is a common solitary parasitoid of water strider eggs (Hetroptera: Gerridae) in western Canada. Recent investigations into preimaginal development of *T. gerriphagus* has led to contradictory observations as have been reported by other authors. A revision to previous *T. gerriphagus* larval descriptions is recommended.

Spence, J.R. S1 Plenary Symposium: "The 'Natural Disturbance Paradigm' and forest management: magic bullet or biodiversity bingo?"
Use of the term "ecosystem based management" does not automatically confer either wisdom or naturalness to resource management tactics. A fire-based conceptual model of forest spatial dynamics is widely embraced as the way to make boreal forestry green and to conserve biodiversity. I summarize recent work to determine whether this conceptual model is necessary, sufficient, and adequately developed to generate specific management tactics. In addition, I suggest that particular biotic elements will be at risk, given the presently adopted approach, and preview developing efforts to understand how the situation might be improved. The role of science in management of biodiversity is discussed.

Spence, J.R., W.J.A. Volney and D.W. Langor. O1 Poster presentation: "The EMEND project."
EMEND refers to "Ecological Management by Emulating Natural Disturbance", a large-scale, multi-agency project being in NW Alberta, Canada. The research will test features of the "natural disturbance paradigm" for boreal forest management by assessing the significance of residual woody material for preserving critical aspects of ecosystem function. The project has two general objectives: 1) to define forest harvest and regenerative practices that best maintain biotic communities, spatial patterns of forest structure, and functional ecosystem integrity, with "best" defined in terms of mixed-wood landscapes that have arisen through wildfire and other inherent natural disturbances; and 2) to evaluate practices in terms of economic viability, sustainability, and socially acceptability. Development of the project is summarized by the poster.

Spence, J.R., H.E.J. Hammond, C. Buddle and D.W. Langor. O1 Poster: "Boreal beetles in harvest- and fire-origin stands."
Arthropods using litter and deadwood habitats were sampled from a chronosequence of fire- and harvest-origin boreal mixed-wood stands in north-central Alberta using pitfall traps and window traps. Measures of species diversity and abundance of taxa, and faunal similarity suggest that the harvested stands converged more quickly on the invertebrate faunal typical of older stands than did those originating after wildfire. Thus, it appears that species characteristic of early succession may be at risk with rapid conversion of a pristine land base

to extensive forestry activities.

Sperling, F. A. Raske (Canadian Forest Service, Box 6028, St. Johns, NF, A1C 5X8), I. Otvos (Canadian Forest Service, Pacific Forestry Centre, 506 W. Burnside Road, Victoria, BC, V8A 1M5). C3 Contributed paper: "Mitochondrial DNA variation among populations of the hemlock looper, *Lambdina fiscellaria* (Gn.)."
A survey of mitochondrial (mt) DNA sequence variation across the range of the hemlock looper showed two distinct mtDNA lineages on the east coast and west coast ends of its range. However, there was substantial geographic overlap of these two haplotypes from Saskatchewan to Quebec, suggesting extensive gene flow between east and west.

Volney, W.J.A. S2 Symposium presentation: "A forest is more than trees; but show me one without trees: do insects modulate forest productivity?"
Forest tree productivity underpins all activity in forests. Arthropods affect virtually all forest ecosystem processes, however. Arthropods thus might determine the physical limits to which biogeochemical processes are permitted to operate. The consequences of boreal forest arthropod activity to global life support systems are discussed.

Welke, S.E. O1 Poster presentation: "Mixed or pure? the effect of pure and mixed stands of douglas fir and paper birch on microarthropods."
Paper birch in coniferous stands may have positive effects on site productivity. To explore this, research is being conducted in pure and mixed stands of douglas fir and birch in the B.C. interior. Stands were sampled for mites and collembolans, and for other measures twice during the growing season. These results will be presented.

Williams, D.J. and D.W. Langor. C3 Contributed paper: "Body size, sexual dimorphism, and confusion: systematics of the *strobi*-group of *Pissodes* (Coleoptera:Curculionidae)."
There has historically been much confusion in the systematics of the four cryptic species of the *strobi*-group of the weevil genus *Pissodes*. An intensive study of adult morphology was carried out to attempt to find diagnostic characters. Regression analysis is used to illustrate significant features of these characters that relate to sexual dimorphism and bionomics of these species. A preliminary diagnosis of species using canonical variates analysis is presented.

Williamson, M.L. O1 Poster presentation: "An index to analyze environmental impacts: A case study on *Btk* and lepidopteran populations in boreal wetlands."
An index was developed to assess effects of aerially applied *Btk* on nontarget Lepidoptera in boreal wetlands. Numbers of Lepidoptera were reduced by *Btk*, whereas richness was not significantly affected. *Btk* affected species differently. This index could be used for studies with optimal impact design having temporal and spatial controls.

ENTOMOLOGICAL SOCIETY OF ALBERTA
MINUTES OF EXECUTIVE MEETING

Sunday, October 5, 1997, Holiday Inn Crowne Plaza Hotel, Edmonton

Present: Jan Volney, President; Mark Goettel, Vice-President; Alec McClay, Secretary; Greg Pohl, Treasurer; Michele Williamson, Editor; Dave Langor, Regional Director to ESC; Rosemarie DeClerck-Floate, Director for Southern Alberta; Kris Justus, Director for Northern Alberta; Mary Reid, Director for Central Alberta; Kevin Floate, Past President.

The meeting was called to order at 5:05 p.m.

Action:

1. Approval of agenda

   Williamson/Pohl CARRIED.

2. Approval of minutes, Executive Meeting of November 1, 1996.

   Langor/Floate. CARRIED

3. Reports:

   3.1 Treasurer

   An interim report was handed out by the Treasurer. One new auditor will be needed for the 1996 accounts and one for the 1997 accounts. It was agreed that the nominating committee would approach James Brandt and Lloyd Dosdall for these positions. — Floate, Goettel

   Treasurer's report ACCEPTED: DeClerck-Floate/Justus.

   3.2 Editor

   The Proceedings of the 1996 annual meeting will be distributed at this meeting. Total printing costs were $468. The Editor thanked Robin Leech and Jack Scott for assistance in taking photographs and preparing the plates.

   Editor's report ACCEPTED: Goettel/Pohl

   3.3 Regional Director to ESC

   The *Canadian Entomologist* is now being printed by the National Research Council, at a cost savings to ESC of about $25,000 per year. Dr. Jean Turgeon will take over as Editor of *Canadian Entomologist* on January 1, 1998. The 1998 annual meeting of ESC will take place in Quebec City, the — McClay

Action:

1999 annual meeting will be in Saskatoon, and the 2000 meeting will be a joint meeting in Montreal with the Entomological Society of America, the Société d'Entomologie du Québec, and possibly the Sociedad Mexicana de Entomología. An ESC website is now operating and can host information for affiliated Societies. It was agreed to discuss a possible web page for ESA at the Annual Meeting.

An issue raised by ESC's Strategic Review Committee was that of profit-sharing of revenues from Joint Annual Meetings. ESC considers that as they take the risk of any losses from Joint Meetings, they should also share in surpluses generated by the meetings. No guidelines have yet been developed to implement this. For the current Joint Meeting, ESC provided a grant of $2,500 and ESA has raised $12,000. It was agreed to discuss a possible formula for revenue-sharing at the Annual Meeting

Regional director's report ACCEPTED: Langor/Reid.

3.4 Joint Meeting Organizing Committee

Langor reported on behalf of Heming that there were currently about 250 people registered for the meeting and that more on-site registrations could be expected. As the target set in the budget for the meeting was 250 it was expected that there would be a surplus.

Joint Meeting report ACCEPTED: Langor/Floate.

4. Old business

4.1 Undergraduate Awards

No nominations were received for the Undergraduate Awards. The Awards Committee will publicize the availability of the awards next year.

4.2 Student Travel Grants

Only two applications for the Student Travel grants were received. Two students from the University of Calgary were awarded $50 each.

4.3 Amateur Award (Carr Award)

Floate reported that Ruby Larson had been nominated for the Amateur Award. Dr. Joe Shorthouse would receive the award on her behalf at the banquet.

4.4 Insect Collector's Guide

The Insect Collectors' Guide has been revised but not yet distributed. Volney/

	Action:
Volney and Williamson agreed to make arrangements for distribution.	Williamson
4.5 Science Fairs	
Science Fairs were judged by Justus, Cárcamo and Reid. Entomological prizes were awarded in four fairs. DeClerck-Floate will advise the new Regional Directors to keep in touch with the Science Fair organizers for 1998. It was suggested that John Acorn's book "Butterflies of Alberta" could be bought in bulk as for use as a Science Fair prize, with an ESA bookplate inside. The official name of the prize is the "Entomological Society of Alberta Science Fair Award".	DeClerck-Floate
5. New business	
5.1 Elections	
Candidates are required for the posts of Vice-President and Regional Director, Southern Alberta. The Nominations Committee will identify candidates for these positions.	Floate
5.2 Resolutions Committee	
It was agreed that the Nominations Committee would appoint a Resolutions Committee.	Floate
5.3 Annual Meeting 1998 5.4 Library Subscriptions 5.5 Website 5.6 Revenue sharing	
Discussion on these issues was referred to the General Meeting	McClay
6. Adjournment.	
The meeting was adjourned at 6:30 p.m.	

ENTOMOLOGICAL SOCIETY OF ALBERTA
MINUTES OF ANNUAL MEETING

Monday, October 6, 1997, Alberta A Room, Crowne Plaza Hotel, Edmonton.

The meeting was called to order at 5:05 pm.

Action:

1. Approval of agenda

   Williams/Williamson. CARRIED.

2. Approval of minutes, Annual Meeting 1996.

   Langor/Reid. CARRIED.

3. Greetings from ESC

   Dr. Hugh Danks, President of ESC, was unable to attend the meeting. Greetings from ESC were conveyed by Langor.

4. Reports:

   4.1 Treasurer (Pohl)

   The 1996 financial report was presented. This will be audited by Pohl and Ono. — Pohl

   Treasurer's report ACCEPTED: Pohl/Spence.

   4.2 Editor (Williamson)

   The Proceedings of the 1996 Annual Meeting were distributed at this meeting.

   Editor's report ACCEPTED: Williamson/Heming

   4.3 Regional Director to ESC (Langor)

   See minutes of Executive Meeting, October 5 1997. Langor also reported that ESC will be undertaking a membership drive for which he will be the chairman.

   Regional director's report ACCEPTED: Langor/Butts.

   4.4 Joint meeting (Heming)

   The program for the 1997 Joint ESA/ESC Meeting included four symposia with 29 speakers, 8 paper sessions, 3 President's Prize sessions, four workshops, and 21 posters. Sixty-one press releases were sent out.

   Joint meeting report ACCEPTED: Heming/Spence

   4.5 President (Volney)

Action:

A verbal report was presented.

President's report ACCEPTED: Volney/Heming.

4.6 Resolutions Committee

Appreciation was expressed to the Organizing Committee and the staff of the Crowne Plaza Hotel for their efforts in making the Joint ESA/ESC meeting a success. CARRIED: Spence/Butts.

5. Old business

5.1 Science Fairs (DeClerck-Floate)

Six out of the seven Regional Science Fairs in Alberta in 1997 agreed to the awarding of a prize by the ESA for insect or arthropod-related projects. Four fairs actually included such projects. These were judged by the Regional Directors (DeClerck-Floate, Justus, and Reid), and four prizes consisting of the book "Butterflies of Alberta" by John Acorn were awarded. One of the projects which received an ESA prize went on to the National Science Fair where it won a bronze medal. DeClerck-Floate thanked the Regional Directors for their help in judging the fairs.

The President proposed that the Society should thank DeClerck-Floate for her efforts in initiating the ESA Science Fair prizes. CARRIED Volney/Pohl.

5.2 Insect Collector's Guide

The Insect Collector's Guide has been revised. Copies will be mailed out to all members for further copying and distribution as required. — Williamson.

5.3 – 5.5 Undergraduate Award, Student Travel Grants, Carr Award

See minutes of Executive Meeting, October 5 1997.

6. New business

6.1 Website

It was proposed that the ESA should set up a website which could be linked to the ESC site. Details of location and content of the website are to be resolved by the Executive. CARRIED: Spence/Langor. — Executive

6.2 1998 Annual Meeting

The possibilities of holding the 1998 Annual meeting in the North (Athabasca) or Central region (Calgary) were discussed. It was proposed — Reid

Action:

that the meeting should be held in the Central region. CARRIED 11-2: Butts /Williamson.

6.3 Institutional Subscriptions - Amendment to Rules and Regulations

Motion: That the Rules and Regulations of ESC be changed by: Williamson
(i) renumbering the existing Rule 1b as 1c, and
(ii) inserting the following as Rule 1b: "The annual subscription fee for the Proceedings is $10.00 for institutions outside the Province of Alberta. Free subscriptions are available to institutions within Alberta and to the National Library of Canada."
CARRIED 24-3: Pohl/Williamson.

6.4 Revenue Sharing with ESC

MOTION: Langor/Williams. That the first $2,500 of any surplus from the Joint Annual ESA/ESC Meeting be retained by ESA, the next $2,500 be returned to ESC, and any amount over $5,000 be split in proportion to the amount of funding raised for the meeting by each Society. Executive

There was considerable discussion. Fry asked whether this would be a general guideline for all Joint Meetings. Langor stated that it was up to each regional Society to develop its own system. Spence contended that any surplus above $5,000 should be kept by ESA. Danyk suggested that the first $2,500 should be returned to ESC and the next $2,500 kept by ESA. Ball proposed that ESC be asked to develop a policy. Pohl and Butts pointed out that if we do not get to keep profits from the joint meeting there will be an impact on ESA finances. Holmberg suggested that a decision be deferred until the financial results of the Joint Meeting were available.

MOTION: Pritchard/Floate. That the motion on revenue sharing be tabled. CARRIED 18-6.

6.5 Elections

The following slate was proposed to fill vacant positions on the executive:
Vice-President: Ken Fry
Director (Southern): Troy Danyk

As there were no further nominations the slate was declared elected.

6. Adjournment.

The meeting was adjourned at 6:20 pm.

Fairview College

March 19, 1997

Rose DeClerck-Floate
Agriculture & Agri Food Canada
Research Centre
P.O. Box 3000
Lethbridge, Alberta T1J 4B1

Dear Rose:

Thank you and the Entomological Society of Alberta for the opportunity of awarding a special prize to an outstanding entomological project at the Peace Country Region Science Fair. The student who won this award was Tara Kemp, c/oPrairie River Junior High, Box 940, High Prairie, Alberta T0G 1E0.

Although we only had one project which would fit into this category, Dave Buck, one of the instructors at Fairview College, judged the project to be worthy of a prize. His letter of recommendation is enclosed. Also enclosed is a copy of her project summary describing her procedure and results.

The book, Butterflies of Alberta by John Acorn, was a lovely book. In fact several people looked through the book before it was awarded. They were careful not to open it too far or crack the spine so it would not look used, but they were fascinated by it.

Thank you for making this award available to our Science Fair participants this year.

Sincerely,

Gerry Hippard

Gerry Hippard, Chair
Peace Country Regional Science Fair

gh

Enc.

Box 3000, Fairview, Alberta, Canada T0H 1L0
Telephone (403) 835-6600 FAX (Administration) (403) 835-6698 FAX (Purchasing) (403) 835-6697

May 20, 1997

The Entomological Society of Alberta
c/o Agriculture and Agrafood
Canada Research Station
P.O. Box 3000
Lethbridge, Alberta T1J 4B1

Attention : Mr. Kevin Float

Dear Kevin:

Re: 1997 Calgary Youth Science Fair

calgary

south

science

fair

society

The Calgary Youth Science Fair Society would like to thank you for contributing an award at the 1997 Calgary Youth Science Fair held April 9-12, in the Big Four building on the Stampede Grounds. This year, thanks to major funding from Norcen Energy, we were able to award gold, silver or bronze medals to over 50% of the students who attended the fair. Additionally, the remainder of the students were given honourable mention medals instead of our usual participation pins.

Enclosed, you will find a picture of the winner of the award(s) your society sponsored. On the back, you will find the name of the winner, the school he/she is from, the name of the project and, of course, the name of the award(s).

We will be contacting you again late in the fall about the 1998 fair. If there is a change of address or contact person's name, please let us know.

If you have any questions or concerns, please feel free to phone me at 250-8299. Thank you again for your support of Calgary's young scientists.

Sincerely,

Leslie Sears
Chair, Prize Committee
CYSFS

encl.

Fairview College

1997 03 18

To Whom It May Concern:

On March 13, 1997 I had the opportunity to judge at the Regional Science Fair (here at Fairview College) in the area of Special Awards, the Entomological Society Award being one of these. Tara Kemp, the winner of this award, did her project on the "Effect of Foundation Wax Colour on Honey Bees" (behaviour and comb development). Tara's project idea indicated that she has good background knowledge of the apiculture industry (a family business as it turns out) and her experimental design, procedures and conclusions were specific to the hypothesis as stated. I found Tara to be a very poised young person well prepared for questions or comments concerning her project.

Sincerely

David Buck

David Buck
Instructor
Agricultural Sciences

DB/ee

Box 3000, Fairview, Alberta, Canada T0H 1L0
Telephone (403) 835-6600 FAX (Administration) (403) 835-6698 FAX (Purchasing) (403) 835-6697

Medicine Hat
C·o·l·l·e·g·e

Mission: *"Medicine Hat College is a comprehensive community-oriented college whose primary mission is to provide quality education, training, and service to its students and local communities".*

March 19, 1997

Rose DeClerck-Floate
Agriculture & Agri-Food Canada
Research Centre
PO Box 3000
Lethbridge, AB
T1J 4B1

Dear Rose,

There were only 2 (out of 170) projects on insects at the 1997 South East Alberta Science Fair! Both of them were in the Grades 4,5,6 Life Science Category. Neither project was of outstanding quality but I did award The Entomological Society Prize to **Rachel Sali** and **Jamie Seitz** of River Heights School, Medicine Hat for their project on **crickets**. I purchased 2 copies of *Butterflies of Alberta* by *John Acorn* (receipt enclosed) and used them as the prize. The recipients seemed to be delighted with the book.

I will be more than willing to judge for the Entomological Society next year.

Yours sincerely,

Robert Mutch, Ph.D.
Dean, Division of Science

299 College Dr. S.E.
Medicine Hat, Alberta, Canada T1A 3Y6
Tel: (403) 529-3811 Fax: (403) 529-2437

Nomination for Dr. Ruby Larson, for the Entomological Society of Canada's Criddle Award and for the Entomological Society of Alberta's Carr Award for amateur entomology. (written by Kevin Floate)

Dr. Ruby Larson was born in Hatfield, Sask. After graduation from high school, she went on to receive a teaching certificate from the Regina Normal School. With seven years of teaching to her credit, Ruby returned to school and graduated from the University of Saskatchewan with an Honours B.A. in Biology in 1943, and with a M.A. in genetics and cytology in 1945. Ruby subsequently received a Ph.D. in genetics, cytology, entomology and biology from the University of Missouri in 1952.

Ruby joined the staff of Agriculture and Agri-Food Canada's Swift Current research station in 1945. In 1948, she was transferred to the Lethbridge Research Centre where she continued to work on the cytogenetics of wheat until she retired in 1979. Her diligence and absolute comprehension of her goals have led to monumental advances in understanding the reaction of wheat plants to sawfly attack, root rot, wheat curl mites and nitrogen uptake.

In recognition of her outstanding achievements as an internationally reknown geneticist and biologist, Ruby was conferred a D.Sc. Honoris Causa by the University of Lethbridge in 1977. She is one of the founding members of the Genetics Society of Canada and was instrumental in starting the Society's journal. She is an honourary life member of the Genetics Society, and is a charter member of the Saskatchewan Institute of Agrologists and of the Entomological Society of Alberta. She also is a founding member of the Lethbridge Science Fair.

Many years ago, Ruby started a Science Club for children. For more than 20 years on Saturdays, her basement was devoted to the enrichment and discovery of science by youngsters. Graduates of this Science Club include Dr. Ken Richards (Ph.D. in Entomology), Dr. Joe Shorthouse (Ph.D. in Entomology), Dr. J. Haberman (M.D.), Dr. Dave Larson, and Dr. Carol Brosgart (M.D.).

Although her professional accomplishments are internationally recognized, it is for her contributions to encourage amateur entomology, through her activities with the Lethbridge Science Fair and her Science Club, for which Ruby is nominated for the Criddle Award (ESC) and the Carr Award (ESA).

ENTOMOLOGICAL SOCIETY OF ALBERTA
FINANCIAL STATEMENT
fiscal year ending Dec. 31, 1997

submitted by Greg Pohl Sep. 1998

	1995	1996	1997
OPENING BANK BALANCE			$11,660.44
CASH ON HAND	$0.00		
TOTAL OPENING ASSETS	$16,621.54	$14,077.86	$11,660.44

REVENUE			
MEMBERSHIPS			
Regular @ $10	$840.00	$500.00	$840.00
Student @ $5	$125.00	$80.00	$130.00
Corporate (incl. exchange)	$13.42	$21.03	$0.00
Total	$978.42	$601.03	$970.00
INTEREST			
Term Deposits	$867.54	$419.02	$402.07
Chequing Account	$38.41	$29.97	$0.00
Common Shares	$30.57	$0.00	$28.19
Total	$936.52	$448.99	$430.26
ANNUAL MEETING			
Total	$2,210.00	$1,975.00	n/incl.
TOTAL REVENUE	**$4,124.94**	**$3,025.02**	**$1,400.26**
EXPENDITURES			
MEETING EXPENSES			
Annual Meeting	$2,970.24	$2,443.62	n/incl.
Executive Meetings	$92.52	$53.95	$0.00
Total	$3,062.76	$2,497.57	$0.00
AWARDS			
Science Fair Prizes	$21.13	$0.00	$112.46
Student Travel Grants		$200.00	$300.00
Other	$3,130.00	$1,500.00	$0.00
Total	$3,151.13	$1,700.00	$412.46
PROCEEDINGS			
Photographic services	$150.41	$283.35	$147.95
Duplication charges		$903.08	$0.00
Total	$150.41	$1,186.43	$147.95
OFFICE SUPPLIES	$0.00	$0.00	$47.22
POSTAGE & MAILING CHARGES	$236.51	$0.00	$26.22
BANK CHARGES	$14.50	$50.44	$25.93
SOCIETY REGISTRATION FEE	$53.31	$8.00	$8.00
TOTAL EXPENDITURES	**$6,668.62**	**$5,442.44**	**$667.78**
SUMMARY			
Opening assets	$16,621.54	$14,077.86	$11,660.44
Revenues	$4,124.94	$3,025.02	$1,400.26
Expenses	$6,668.62	$5,442.44	$667.78
Balance	$14,077.86	$11,660.44	$12,392.92
CLOSING BANK BALANCE:			$12,379.14
CASH ON HAND:			$13.78
TOTAL CLOSING ASSETS:			**$12,392.92**

ESA MEMBERSHIP LIST
updated July 10, 1998

address 1 = Dept. Biological Sciences, University of Alberta, Edmonton, AB, T6G 2E9
address 2 = Northern Forestry Centre, Canadian Forest Service, 5320 - 122 St., Edmonton, AB, T6H 3S5
address 3 = Agriculture and Agri-Food Canada, Lethbridge Research Centre, P.O. Box 3000, Lethbridge, AB, T1J 4B1
address 4 = Dept. Biological Sciences, University of Calgary, Calgary, AB, T2N 1N4
address 5 = Alberta Environment Centre, Bag 4000, Vegreville, AB, T9C 1T4,

Honourary Members

Carr, John 24 Dalrymple Green NW, Calgary, AB, T3A 1Y2, H 288-4634
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Gushul, Evan 1714 15 Ave. South, Lethbridge, AB, T1K 0W9, H 328-2426
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Nelson, Bill 1020 Fern Crescent, Lethbridge, AB, H 327-4736

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ENTOMOLOGICAL SOCIETY OF ALBERTA BY-LAWS

ARTICLE I

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

Memberships, Dues, and Expenditures

a. Any persons 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.

Honourary Life Membership may be conferred on anyone who has performed long and distinguished service in the field of entomology. The total of Honourary Life Members shall not exceed fire percent of the total membership at the time of election. An Honourary 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 Honourary 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 Honourary 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 for each member as provided for in Section I 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 shall be considered the Annual Meeting and shall be held in the locality decided upon the preceding Annual Meeting. One-quarter of the total paid-up memberships shall constitute a quorum.

ARTICLE V

Officers

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 five 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 geographic 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 normally be held by the same person for two consecutive years. The Vice-President shall normally follow his/her term for 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 three years, with his/her term of office beginning at the end of an Annual Meeting of The Entomological Society of Canada. A regional Director is not immediately eligible for re-election.

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 appointments is made. A vacancy in the office of President shall be filled by the Vice-President who will then serve his/her 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) had 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, shall chair the Science Fair Liaison Committee and the Membership Committee, and shall perform such other duties as shall from time to time be imposed upon the Vice-President by the Council.

The Secretary shall maintain a record of all meetings and act as custodian of minute books and current correspondence, and shall forward appropriate material to the Agriculture Canada Station in Lethbridge for storage in the Society's archives.

The Treasurer shall receive and disperse all funds, handle all correpondence relating to membership in the Society, 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 signing officers of the Society shall be the Treasurer and either the President or Secretary.

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 in 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.

July 1998

ENTOMOLOGICAL SOCIETY OF ALBERTA
RULES AND REGULATIONS

1. a. The annual fee for full membership shall be $10.00.

   b. The annual subscription fee for the Proceedings is $10.00 for institutions outside the Province of Alberta. Free subscriptions are available to institutions within Alberta and to the National Library of Canada.

   c. 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. The interim financial statement shall be presented by the 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 elected at each Annual Meeting to examine the accounts of the current year and the annual financial statement.

3. a. Registration fees for student members of the Entomological Society of Canada attending the Entomological Society of Canada meeting 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. Awards Committee - members: Past President, Regional Director to ESC, and the Regional Directors of the ESA. Duties: to solicit and generate nominations of the Entomological Society of Alberta members for Entomological Society of Canada awards (e.g., Gold Medal, Gordon Hewitt, Normal Criddle) and Entomological Society of Alberta awards (e.g., Honourary Membership, Undergraduate Award, Student Travel Grant, Amateur Award).

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

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

d. Nomination Committee - members: the Past President, the 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 Committee at the Annual Meeting.

e. Resolutions Committee - members: two Society members shall be appointed by the Nomination Committee immediately preceding each Annual Meeting.

f. Science Fair Liaison Committee - members: Vice-President (as chair) and three Ordinary Directors. Other members to be appointed as necessary by the Committee. Duties: to maintain contact with the principal Science Fairs in AB.

g. Membership Committee - members: Vice-President (as chair), and three Ordinary Directors. Duties to publicise the objectives and activities of the Society in such a way to recruit new members to the Society.

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

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

Corwn Plaza *Ivoried bug tower*	*General Chair* Bruce Hemming	*Congenial hosting*	*Heritage Lecturer* George Ball
Entomologists in Space and Time: South Clade Ed Becker	Ed Becker's *Retirement Party*	*South Clade Satellite* Joe Shorthouse	*South Clade* Kevin Floate
South Clade Dan Johnson	*South Clade* Rick Butts	*Central Clade* Colin Hegert	*Central Clade* Mary Reid	*Central Clade* Risa Sargent
North Clade Sunil Ranasinghe	*North Clade* Mike Dolinski	*North Clade* Bill Samuel	*North Clade* Jan Volney
North Clade John Spence	*North Clade Satellite* Jari Niemala	*North Clade* Dave Langor	*North Clade Satellite* Chris Klingenberg
North Clade Satellite Dylan Parry	*North Clade Satellite* Cam Currie	*North Clade* Jim Hammond	*North Clade* Joao Sousa
North Clade Lineage A Jeff Battigelli *President's Prize*	*North Clade Lineage A* Rosalind Barrington-Leigh	*North Clade Lineage A* Andrea Durand	*North Clade Lineage A* Chris Buddle

North Clade Lineage A Kamal Gandhi	*North Clade Lineage B* Susan Bjorson	*North Clade Lineage A South Descent* Dave Shorthouse	*North Clade* Jens Roland	*North Clade Lineage C* Barry Cooke
Northern Inbred? John Acorn	*Definitely the Nature Nut*	*Fair Winners: The next generation*	*ESC Outgroup Population*	
Cheers	*Another picture!*	*Award-giving* Julie Soroka	*President's gathering*	
Hold up!	*Bottom's up!*	*Ease up!* Henri Goulet	*Listen up!*	
Boy's club	*Girl's club*			
	Michel Fortin	Neville Winchester		
Peaty Dale	*The President speaks*			

CONTENTS CONTINUED FROM FRONT PAGE