PROCEEDINGS OF THE NINTH ANNUAL MEETING

OF THE

ENTOMOLOGICAL SOCIETY

OF

ALBERTA

EDMONTON - ALBERTA

OCTOBER 27TH - 28TH, 1961

Proceedings of the

ENTOMOLOGICAL SOCIETY OF ALBERTA

Volume 9 March, 1962

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THE NINTH ANNUAL MEETING

The Ninth Annual Meeting of the Entomological Society of Alberta was held in the Kingsway Motor Hotel on Friday and Saturday, October 27 and 28, 1961. Many of the members, however, got together on Thursday evening, in various parts of the city, notably in the homes of Dr. B. Hocking and Dr. G. E. Ball, and, after an executive meeting, in the suite of the President, Mr. J. W. Edmunds.

The attendance at the 1961 meeting was excellent. A total of fifty-three members were registered and of this number five came from Saskatoon. It was most gratifying that these members came to the meeting from another province and it is hoped that they will continue to do so.

Twenty-eight papers were submitted for the meeting following a trend that has developed in recent years of an increasing participation by the members resulting in a program of papers which were short and to the point and which covered a variety of subjects. This type of program appeared to be enjoyed by all since the problem of keeping to the scheduled times was minimized with the presentation of papers of from ten to fifteen minutes length and attention never had a chance to lag.

The Annual Banquet was held on Friday evening and this was followed by a most interesting account of a trip made down the entire length of Africa by Dr. B. Hocking. Slides were shown of various subjects from localities including the Upper Nile, Tanganyika, Zanzibar, Victoria Falls and Capetown. Tape recordings of the tribal music of the inhabitants of western Tanganyika were also heard by the members in addition to a commentary by Dr. Hocking on the types of instruments used. All in all, it was a very enjoyable evening.

On Saturday morning the Annual Insect Collection Competition judging took place. A number of new entrants were noted this year and some of the collections were extremely good. The prize winners are noted on a later page.

PRESIDENTIAL ADDRESS

This has been a very, very busy year. I say this without any hesitancy. Perhaps not for this organization as an organization, but one has no hesitancy in suggesting for the organization's members, it has been a busy year. Anyone (excepting a few) not busy in this age is either too young, too old, ill, unimaginative, or lazy. A few and I stress a few are intelligent enough or strong enough to limit themselves to the things that need doing.

I make few apologies for the inactivity of our organization this past year. We have left undone some things that should have been done. I am certain by the end of this meeting we will be amazed at how much has been accomplished by the members of this fraternity.

Before continuing further, I would like to welcome the Saskatchewan visitors, new comers to our organization and Dr. Hocking, who has just returned from a year's absence.

I am sure that we as aspiring scientists must take time out periodically to assess the objectives and motives behind our activities. It is interesting to note that to get an accurate compass reading, one must stand still. Having a compass is no assurance one is not lost.

Few of us are presently doing what we intended to do. We have been sidetracked by unforeseen problems cropping up, by unexpected opening or closing of doors, so that now we may find ourselves going at varying angles to the original course we charted. Let me stress this is not necessarily good or bad. Of one thing I am certain, it is relevant that we know our present position, and that we have a course planned for our work.

I should like at this time to review, renew or state a few facts.

1. We like to think of ourselves as scientists. As such our obligations are to attempt to transfer items from the field of theory, philosophy or unknown to the field of fact to discover new theories or philosophies.

2. We require, to be useful, inquisitive, imaginative minds. We must train ourselves to constantly wonder (hence you are excused if you appear to be in a daze, unless the reason goes back to John Barleycorn), to ask continuously "why, why, why" or in Indian Language "How?".

3. I am not so naive to think we can go on forever asking why or how - without getting a few ideas or theories. This is good.

4. The scientist will allow himself to think and work, far into the night or early morning (for which he will get no overtime - he may collect some rewarding criticism from his wife or family). A scientist cannot turn off his ability to wonder.

5. As I said earlier - we must attempt to transfer our thinking, our theories into facts.

6. One of the highest tributes which can be made to a man is that he is an honest recorder of facts.

7. Honesty and integrity and very high morals are absolutely essential, if we are to be classed with the scientists who are worth remembering.

ABSTRACTS OF PAPERS PRESENTED

Biology of the sugar beet root maggot, Tetanops myopaeformis (Röder) (Diptera: Ortalidae)

A. M. Harper

There is only one generation of the sugar-beet root maggot, Tetanops myopaeformis (Röder), a year in southern Alberta but the emergence reached one peak in mid-June and a second, smaller one in early July. The period of daily flight activity of the adults was mainly from 10:00 am. to 5:00 pm., the peak occurring between 12 noon and 1:00 pm. The females laid more than 80% of their eggs within one quarter inch of the beet and all within three quarters of an inch. All eggs were laid in the upper one half inch of soil. The eggs were laid singly or in clusters of up to 30 eggs per cluster. In August 75% of the larvae were at a depth of 5-7 inches in the soil. In most samples they were just above the interface between the topsoil and subsoil horizon. T. myopaeformis overwinters as a mature, diapausing larva, which pupates in May and early June. Most of the adults emerge in June and early July.

A Needle Tier on Pine

C. E. Brown

An outbreak of a needle tier on Jack pine was discovered in Northeastern Alberta in September, 1961. The insect was believed to be Argyrotaenia tabulana Free. This insect is occasionaly received in survey collections but it is the first time since 1925 that it has occurred in outbreak proportions. The only other recorded outbreak was in Yellowstone National Park from 1921 to 1925.

Relative resistance of different stages of the desert locust Schistocerca gregaria Forsk. to insecticidal injections.

Ajai Mansingh

Fifteen different insecticides were injected into the body cavity. The younger stages of hoppers were more susceptible than the older ones. The difference in the resistance to the insecticides was least between the third and fourth stages than between any other succeeding stages. From the fourth stage onwards, the less toxic insecticides like DDT, nicotine, pestox and malathion had a great reduction in their toxicities as compared to more toxic ones like aldrin, dieldrin, lindane, etc. The fifth stage hoppers were three times more resistant to lindane sprays than the fourth stage while the adults were only 1.2 times more than the fifth stage. The adults were six times more resistant than the

fifth stage towards lindane injections and sandwiches. These observations suggest that the protective development of the body wall is more pronounced in the fifth stage while physiological and biochemical mechanisms are more protective in the adult stage.

Endocrine interrelations in the life history of Adelphocoris lineolatus (Hemiptera: Miridae).

A. B. Ewen

Two types of neurosecretory cells, based on size and selective stainability, are described from the central nervous system of Adelphocoris lineolatus (Hemiptera: Miridae). Cycles of activity in these cells, and in the secreting cells of the corpora paracardiaca and corpus allatum, are described. It is suggested that the neurosecretory A-cells of the pars intercerebralis medialis, the corpus allatum, and the ovaries form an endocrine system that is involved in egg production and oviposition. Preliminary data suggest that neurosecretory cells in the suboesophageal-prothoracic ganglion complex may play a role, along with the corpora paracardiaca, in maintaining the thoracic glands in the nymphal insect.

Biochemical Views of Sawfly Resistance in Plants

A. J. McGinnis and R. Kasting

The role of three nutritional concepts, starvation, toxicity, and balance on resistance of solid-stemmed wheat varieties to the wheat stem sawfly was reviewed. Deficiencies of carbohydrate and protein in the pith of solid-stemmed wheat plants appear not to be responsible for resistance but the moisture levels may be important. Evidence was presented for an ether extractable component in Golden Ball pith that is toxic to newly hatched larvae of the pale western cutworm. Whether this component contributes to resistance against the sawfly is not yet known. Evidence from studies with the cutworm suggests that a wide carbohydrate: nitrogen ratio may be detrimental to larvae. Moreover, an increase in the essential amino acid, leucine, was shown to interfere with development of newly hatched cutworms. It was concluded that resistance of plants to the sawfly probably results from a complex of factors and that plant breeders can develop varieties with greater resistance when more information on these factors is available.

The Relation of Hatching Temperature to Diapause in Eggs of the Pale Western Cutworm (Lepidoptera: Noctuidae).

L. A. Jacobson

Diapause eggs of the pale western cutworm, Agrotis orthogonia Morr., hatched readily at 20° C., or above but the rate of hatching at 15° C., 10° C., and 5° C. was very slow and erratic. As diapause was eliminated the rate of hatching at all temperatures was accelerated but the rate was directly associated with hatching temperature. The data show that the weak diapause is sufficient to avert hatching in the field when warm weather occurs in the fall and to ensure that most, or all, of the eggs hatch in the spring.

Parasites and Predators of the Engelmann Spruce Weevil, Pissodes engelmanni Hopkins. (Coleoptera: Curculionidae)

R. E. Stevenson

The Engelmann spruce weevil is an indigenous insect to western North America. Injury is characteristic of tip weevils wherein the loss of a leader results in a subsequent deforming (crooks or forks) in the bole. There is one generation annually with adults overwintering in the forest duff. The following insects were obtained from infested leaders through individual and mass rearing:

ORDER	FAMILY	GENUS - SPECIES
Hymenoptera	Eurytomidae	Eurytoma pissodis Grlt.
	Ichneumonidae	Dolichomitus terebrans nubilpennis (Vier.)
		Exeristes comstockii (Cr.)
	Chalcididae	Rhopalicus pulchripennis
		Amblymerus sp.
	Braconidae	Helcostizus rufisentum Cush.
		Eubadizon strigitergum Cush.
		Eubadizon sp. A.
		Eubadizon sp. B.
		Bracon pini (Mues.)
Diptera	Lonchaeidae	Lonchaea corticis complex
Coleoptera	Staphlinidae	- - - - - - - - - - - - - -
	Cleridae	Thanasimus dubois

Of these E. pissodis Grlt. and D. terebrans nubilipennis (Vier.) were solitary external parasites feeding on late instar larvae and pupae of P. engelmanni Hopks. The larvae of L. corticis were found to be predators. The remainder were reared in varying quantities from material collected in Alberta, British Columbia, and Idaho.

Investigations show all parasites and predators to have one generation annually. All overwinter either as larvae or pupae in the weevil pupal chambers. Parasitism is believed heaviest just prior to and during weevil pupation.

Variation in Number of Larval Instars in Broods of *Semiothisa* and *Metanema*.

W. C. McGuffin

Rearing of broods of two species of *Semiothisa*, *S. bisignata* Walker and *S. perplexa* McDunnough, show that larvae destined to be female moths may be of two kinds, those with n instars and those with n + 1 instars. From these broods one male emerged of which the larva had n instars. In *Metanema determinata* Walker the males have n instars also and the females have n + 1 instars. No females of the n kind were reared in *Metanema*.

Fatty Acids in Grasshoppers. Preliminary Report.

P. W. Riegert

Preliminary investigations of ether-extracted fats of grasshoppers, made by gas liquid phase chromatography, indicated that: a) there is no change in the fatty acid composition during the first ten days of adult life, b) different genera of grasshoppers may have differing but specific fatty acid make-up, c) grasshopper fat contains more long-chained fatty acids than do mammals, but fewer than some plants.

Possible Taxonomic Characters in the Lepidopterous Wing Base.

Janet Petersen

The structure of the wing base is very different in primitive and advanced Lepidoptera. At one evolutionary level, however, the wing base morphology is remarkably constant. Axillary structures will probably prove important in evaluating the relationships of the major groups of Lepidoptera. When the venation is reduced the axillary sclerites and the bases of the veins are complete. For this reason wing base morphology is particularly useful in the Stigmelloidea and Tinaeoidea.

The Sugarbeet Nematode, *Heterodera schachtii* Schmidt, in Southern Alberta.

A. M. Harper and C. E. Lilly

The sugarbeet nematode, *Heterodera schachtii* Schmidt was found on June 22 of this year in one field near Taber, Alberta. This is the first report of this pest in western Canada. Although an extensive survey was undertaken no other infested fields were found. Because this pest poses a serious threat to the sugar beet industry in southern Alberta a full scale eradication program was undertaken.

Root Weevil (Hylobius) Studies in Alberta (Coleoptera: Curculionidae).

H. F. Cerezke

The known distribution and life cycle of Hylobius warreni and H. pinicola were briefly stated. A summary of the results of the current summers weevil sampling were presented. This summary included a description of Hylobius distribution according to plot areas, tree density, tree size, and to depth of living and dead organic material around the base of sampled trees. These studies were preliminary to further investigations, whereby the effects of pulp cutting and other subsequent forestry practices can be followed annually in conjunction with root weevil population trends.

Mode of Action of Insect Repellents

A. A. Khan

The literature on the mode of action of insect repellents was briefly reviewed and the various theories on olfaction were mentioned in short outline. Experiments which were done to test the theory of lipoid solubility were described and the results support the contention that lipoid solubility plays some role in olfaction. Experiments which are being conducted to check the role of the common chemical sense in insects as it is related to the mode of action of repellents were also mentioned.

A Trypetid Pest of Sunflowers, Euarestoides finalis (Lw.) (Diptera: Trypetidae)

G. E. Swailes

Euarestoides finalis has been found throughout the sunflower growing areas in southern Alberta. The number of generations per year has not been determined. Puparia were found in cultivated sunflowers in early August. Adults emerged during the first two weeks of August and eggs were laid during late August and early September. Puparia collected in late September emerged immediately when taken into the laboratory. Assessment of damage in one field on August 3 showed 63% of the mature heads with damage and these averaged 2.1 larvae per head. Only 14% of the infested heads contained more than five larvae per head.

Somotrichus elevatus Fab. in the United States (Coleoptera: Carabidae).

R. Madge

A brief description of *Somotrichus elevatus* was given. Its predominantly tropical range was outlined and it was hypothesized that this species was spreading from an African centre of origin. The habits of the adult beetles were briefly discussed. Two occurrences of this species in the United States, one from Seattle, Washington in 1948 and a new record from Deerfield Beach, Florida in 1960 were reported.

Nosema - a Disease of Adult Honey Bees Caused by *Nosema apis* Zander (1909)

J. Edmunds

Nosema apis is a spore-forming protozoan which is known to inflict severe losses to honey bee colony populations. The parasite enters, infects, and leaves by way of the digestive tract of the honeybee. The parasite grows and multiplies for the most part in the epithelium of the ventriculus. Although this organism is known to be present in Alberta, its importance to honey production is as yet unassessed in the province.

Observations on Mosquito Biology.

D. C. D. Happold

Two features observed uring the summer's field work were discussed.

First, it seems as if predation by larval and adult dragonflies on mosquitoes is not nearly as great as imagined. Adult dragonflies and adult mosquitoes are spatially separated due to differing environmental and climatic requirements; dragonfly larvae and mosquito larvae occur in differing types of water habitat - this is partly due to behavioural differences in the adult females.

Second, the productivity of different environments was investigated. *Drapanocladus-Carex* association was the most productive, followed by areas dominated by certain grass species. Bogs are less productive than imagined due to rapid drying action; similarly open waters are not condusive to dense mosquito populations.

Ants in my Pantids

B. Hocking

A mantid which mimics the swellings at the base of the thorns of *Acacia drepanolobium* in East Africa and which feeds on the ants which inhabit these swellings is described and illustrated. Some observations on its habits and life history are included.

A Method of Making Extreme Close-Up Photographs of Insects in Their Natural Habitat.

N. E. Kloppenborg

By means of using a special adaptation of the Leitz Behoo close-up device and the Braun F.60 flash unit excellent photographs can be made of live insects in their natural habitat.

The system is limited to reproductions from 1 : 3 to 1 : 1½ or expressed in area it covers subjects from 71 x 108 mm. to 36 x 54 mm. on the 35 mm. camera; and by simple modifications the range can be expanded in both directions.

The system is extremely easy and convenient to use, it allows a great deal of freedom of movement, and it yields excellent results.

Preliminary investigations on prey capture in dragonfly larvae (Odonata: Anisoptera)

G. Pritchard

Prey capture in larval dragonflies centres around the unique labium, which lies folded beneath the head at rest but can be shot out with amazing rapidity at unsuspecting prey. Normally larvae lie in ambush until prey is sighted and then they stalk the prey and prepare for the strike. This demands getting the prey at the correct distance and in the correct line, for little control can be exercised over the strike once it has been released. Larvae show an accuracy of 60-70% and most misses are short indicating an error in the judgement of the distance of the prey rather than its direction. Generally dragonflies depend solely on their well developed eyes for detecting prey and for receiving the stimuli that lead to the release of the strike. Tactile and chemical stimuli are not important in releasing the strike, whereas movement and size are. Dragonfly larvae show no preference for any particular colour. The forward thrust of the labium is most probably brought about by a sort of hydraulic mechanism involving blood pressure. Prey is caught by the labial palps which have their own muscles and are closed when the labium is fully extended. The head is prognathous and the labium brings the captured prey back to the forwardly-directed mandibles.

Many of the behaviour patterns shown by the dragonfly larva when capturing prey vary with the physiological state of the animal, particularly its state of starvation and stage of development.

Role of Vitamin A in Ectoparasitism.

W. A. Nelson

A brief review of some of the conflicting literature was presented. Recent work on metabolism of vitamin A has shown that it is required in cholesterol metabolism, corticosterone and muco-polysaccharide biosynthesis. These substances are all important in the maintenance of the integrity of tissue, both mucous and connective, and in the tissue antigen-antibody response. Therefore, a deficiency of vitamin A would probably tend to increase parasitic invasion of tissue. The similarity of blood-sucking insects to blood-sucking helminths was stressed.

Nest Establishment of Bumble Bees in Artificial Domiciles (Hymenoptera: Apidae).

W. O. Nummi

A higher number of acceptances of artificial domiciles by bumble bees was obtained in 1961 than in the previous year. This was accomplished by placing out more domiciles within the foothills region of south western Alberta where populations of Bombus were more abundant. Also, by placing out more underground domiciles we were able to attract more Bombus females.

From underground domiciles placed out within the Prairie Region we obtained 25% acceptance out of 52 and 54% out of 128 in the Foothills Region.

From above ground domiciles placed out 5.8% out of 104 were accepted in the Prairie Region and 52% out of 256 domiciles were accepted in the Foothills Region.

Bumblebees (Hymenoptera: Bombidae).

G. A. Hobbs

The relationship between bumblebees and the cuckoo bee, Psithyrus was discussed and some reasons were given as to why Bombus rufocinctus may be evolving, as far as its behaviour is concerned, in the direction taken by Psithyrus.

Control of Tribolium confusum Jacq. du Val and T. destructor Wyttenb. by Vacuum Treatment (Coleoptera: Tenebrionidae)

H. J. Bhambhani

Some commodities, namely walnuts, bran and whole wheat flour, infested by Tribolium confusum and T. destructor were subjected to an absolute pressure of 1" mercury at 100° F for various periods and it was found that this treatment for four hours produced 100% mortality of larvae, pupae and adults of both the pests. In these and some other experiments, 2430, 420 and 7867 larvae, pupae and adults of T. confusum, and 3364, 105 and 651 larvae, pupae and adults of T. destructor respectively were used and this treatment was found to be effective against various instars of larvae, pupae and adults of different ages, including newly emerged adults. It is recommended that the infested commodity be subjected to an absolute pressure of 1" mercury for four hours at 100° F in order to control T. confusum and T. destructor.

Some Factors influencing the Possibilities of Black Fly Outbreaks in Alberta (Diptera: Simuliidae).

F. J. Hartley Fredeen

Thirty species of black flies have been collected in Alberta, most of these from the agricultural areas. At least 15 species are considered to have some economic importance as a result of either their abundance or their blood-feeding habits or both. These include S. vittatum, venustum, verecundum, tuberosum, luggeri, decorum, griseum, bivittatum, meridionale, rugglesi, transiens, defoliarti, corbis, malyshevi and arcticum. Other species (mainly Prosimulium, Cnephia and Eusimulium species) are at the moment considered to be less important.

Damaging outbreaks of S. arcticum have occurred east of Edmonton, especially in the Mannville district. In recent years S. griseum has been the cause of annual complaints at Medicine Hat. Black fly larvae have been successfully grown on bacteria alone, however reasons are given to indicate that sewage bacteria are not considered to be contributing much if anything to outbreaks of S. arcticum.

Collecting Data for Lepidoptera in Southern Alberta in 1961.

N. W. Van Veen

The collecting this spring and summer has been very rewarding and interesting in our opinion. The spring had a hot spell and the summer was very dry. A greater variety of species were observed and caught than in the previous years. Due to the afore-mentioned climatic changes, most species in Southern Alberta (that is East of the Rocky Mountain Range, but still in the foot-hills) were in general two weeks earlier

on the wing than in all the other years.

The fall therefore was of some disappointment. It seemed that most species had finished their cycles at the end of the second week of August, while in other years, we still would be collecting into the first week of September.

We again noticed an almost complete absence of Nymphalis cardui this season. Leminites arthemis is very small in numbers. Very few Polygonias and not one Nymphalis J-album; also very few Vanessa antiopa, but against this, the sudden appearance (most welcomed by us) of Papilio zelicaon and P. nitra (for the first time after a very long absence). Some caterpillars of the Monarch were seen in milkweed in southeastern Alberta. A far greater number of Oeneis macouni were caught than we expected.

In all, an interesting and rewarding season.

Observations on the Migration of Warble Fly Larvae in Natural and Artificial Infestations (Diptera: Oestridae)

M. A. Khan

It is generally believed that first instar larvae of Hypoderma lineatum (De Vill.) and H. bovis (L.) live in the connective tissue while migrating through the animal body. Evidence has been gathered to show that both in natural and artificial infestation the migrating larvae will cut through the muscles and other organs of the animal and do not necessarily stay in the connective tissue.

The migrating larvae cause inflammation, congestion, and edematous infiltration in the esophagus and, judging from the inflammatory lesions seen, it is suspected these lesions may cause serious complications. Congestion and slight hemorrhage was also noticed in the spinal canal in the areas surrounding the larvae.

In artificially infested rabbits the larvae placed surgically in the abdominal cavity appeared in the back in four to five days. These larvae cut a hole through the skin but did not form the 'warbles' seen in cattle.

Parasites of Horn Flies in Alberta (Diptera: Muscidae).

K. R. Depner

The first incidence of parasitism of horn flies in Alberta was noticed in southern Alberta in 1955 when an Ichneumonid of the genus Phygadeuon was found emerging from field reared horn fly puparia.

Further investigation in 1960 disclosed the presence of three

more species of Hymenoptera in the family Pteromalidae and genera Dibrachys, Habrocytus and Spalangia. Of the four, only Spalangia could be identified to species and proved to be S. drosophilae (Ash.).

Investigation in 1961 confirmed the presence of the four parasites already found, but showed an abundance of each varying with the vegetative zones of Alberta, and disclosed the presence of three new parasites which are as yet undetermined.

INSECTS OF THE SEASON 1961

Alberta

By

The Staff
Entomology Section
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Cutworms.--The red-backed cutworm, Euxoa ochrogaster (Guenée), was not a serious problem this year. In 1959 and 1960, infestations and damage were general in the parkland areas of central Alberta but in 1960 damage was confined to a few fields in the Lacombe area and to gardens in other districts.

A marked increase of the pale western cutworm, Agrotis orthogonia Morrison, occurred in southern Alberta in 1961. The number of infested fields increased several-fold over that recorded in 1960. The continuation of drought conditions points to further increases in 1962.

Infestations of the army cutworm, Chorizagrotis auxiliaris (Grote), in April and May, 1961, occurred mostly on commercial mustard and flax in the Warner-Milk River area. Damage was less severe than in 1960 due to the advanced development as a result of the mild winter.

Grasshoppers.--The hatch was somewhat delayed by rains the first two weeks of May but proceeded rapidly during the last week of May and was completed early in June. Adults were first seen on June 20 and by the end of July the population was all adult. Infestations were heavy and damage occurred generally through the south. At the time of the adult survey 'severe' populations of Camnula pellucida (Scudder) occurred in a large area surrounding Drumheller and in smaller areas between Calgary and Lethbridge. Considerable poisoning was done earlier in the year but as the drought progressed some apathy was observed. Approximately 40,000 gallons of poison were distributed by the government and an unknown (but small) quantity was purchased from local dealers.

Following the adult survey a decrease in numbers of grasshoppers became very noticeable in the southern parts of the infested area. The decrease occurred between August 15 and September 1. At the latter time dead grasshoppers were very common on the ground and in sufficient numbers to suggest that mortality and not migration was the cause of the decline. Many of the better preserved corpses had parasite exit holes and in a live collection made at the end of August many individuals were found to be parasitized.

During the egg survey the number of egg pods was smaller than than would have been expected from the adult survey. Because many adults were present in the latter part of July it would seem that the

parasites were active then and prevented egg development in a large percentage of the grasshoppers. The forecast for these southern areas will show a considerable decrease from the adult survey. The more northern parts of the area from the Bow River through Drumheller, however, show heavy concentrations of Camnula eggs and the forecast will follow the adult survey closely.

Wireworms.--Damage to cereal crops by wireworms was very light this year, due in part to the spring drought, which curtailed wireworm activity. Limonius pectoralis LeConte was found in economic numbers for the first time in southern Alberta when a field of spring wheat near High River was reduced by approximately 10 per cent.

The wheat stem sawfly, Cephus cinctus Norton, population in Alberta and Saskatchewan increased in 1961 over 1960. Sawfly-resistant bread wheats were found in only 18 per cent of 80 fields of spring wheat selected at intervals along a predetermined route through Alberta and Saskatchewan. In Alberta sawfly damage over 30 per cent occurred near Alsask and southeast of Lethbridge. In Saskatchewan moderate to severe damage occurred in four areas, (1) near Abbey, (2) from Swift Current through Gravelbourg to Assiniboia, (3) from Watrous to Meacham, and (4) from Saskatoon to a few miles south of Delisle.

The Say stinkbug, Chlorochroa sayi Stål, increased markedly in southern Alberta during the 1961 season. Economic infestations occurred in the area from Taber to Medicine Hat; along margins in many fields populations on wheat averaged five per sweep. In one field at Grassy Lake dieldrin at two ounces per acre was applied to reduce numbers and protect the crop.

In 1960, the peak number of the alfalfa weevil, Hypera postica (Gyllenhal), larvae per sweep on the one field in the Milk River valley that has been sampled since 1954 was 263. In 1961, the peak number was 483 per sweep, the greatest number per five-sweep sample being 685 per sweep. Survey of the irrigated areas of southern Alberta showed that the weevil has not yet spread completely over the area. Weevils were not found in the Strathmore and Gleichen areas nor in the alfalfa fields south of the Red Deer River and north of Duchness. However, for the first time they were present in sufficient numbers in the Lethbridge area to produce noticeable defoliation (40 per sweep). Because the fields in the Milk River valley are isolated by many miles of unbroken prairie and wheat land from the main alfalfa-growing areas of southern Alberta, population buildup has probably been faster there because diffusions of adults within these small isolated areas result in reinfestations from more and more points. When diffusion is complete in the large irrigated areas, it is probable that densities will then increase greatly as in the Milk River valley.

The sugar-beet root maggot, Tetanops myopaeformis (Röder), caused serious damage in many untreated sugar-beet fields in southern Alberta. It extended its area of infestation from the light sandy soil into the heavier soil areas. Approximately 12,000 acres were treated for this pest.

The sugar-beet root aphid, Pemphigus betae Doane, was present throughout the sugar-beet-growing areas of Alberta in larger numbers than for several years. A predator of this aphid, Thaumatomyia glabra, was also present wherever heavy infestations were found.

No infestation of the spinach carrion beetle, Silpha bituberosa LeConte, was found in beet fields in 1961.

The beet webworm, Loxostege sticticalis Linnaeus, caused some damage in localized areas but populations were generally low and only a few fields of beets were sprayed.

Flea beetles, Phyllotreta sp., caused some damage to seedling beets and a few fields were sprayed for this pest.

Populations of the beet leaf miner, Pegomyia betae Curtis, were much lower than normal this year.

Generally aphids in southern Alberta were present in much smaller numbers than in recent years.

The sugar-beet nematode, Heterodera schactii Schmidt, was discovered this year near Barnwell, Alberta, by C. E. Lilly and A. M. Harper. The infestation was in a 12-acre field and had completely ruined approximately 3-4 acres of the crop. A survey of every field within five miles of the infested field failed to reveal other infestations. Throughout the irrigated areas of southern Alberta 720 fields were examined and no other infestations were found. The infested field was fumigated and will be taken out of production for six years. On our advice the Canadian Sugar Factories Limited has informed all growers that a four-year rotation is recommended at once and will be mandatory in 1963.

Incidental Reports of Insects

Field Crops.-- beet webworms and flea beetles on mustard and rape, blister beetles on clover, sweet clover weevil, clover leaf weevil, Mormon cricket.

Household.--clover mite, carpet beetle, clothes moth, boxelder bug, strawberry root weevil, wasps, honey bees, ants, German cockroach, field and camel crickets, black widow spider, false scorpion.

Ornamentals, garden and greenhouse.--cotton gall mite, spruce gall aphid, fall cankerworm, aspen leaf beetle, oyster shell scale, willow leaf gall sawfly, clover mite (dahlia), currant fruit fly, gladiolus thrip, blister beetle, pear slug, rose curculio, earwig, garden slug, white grubs and earthworms in lawns.

Garden symphylans severely infested carrots and potatoes in one home garden in Lethbridge; this pest has not been reported here for several years. The apple mealy bug was recorded for the first time in southern Alberta. Two cotoneaster hedges were severely infested.

Stored products.--golden spider beetle, red flour beetle, Indian meal moth, flat grain beetle, saw-toothed grain beetle, psocids, rusty grain beetle, granary weevil.

Forest Insects

By

The Staff
Forest Biology Laboratory
Calgary, Alberta

The forest tent caterpillar Malacosoma disstria Hbn. was responsible for defoliating large areas of aspen in the east central and northwestern part of the province in 1961. Approximately 26,000 square miles were either moderately or heavily defoliated.

The spruce budworm Choristoneura fumiferana (Clem.) caused increased damage in 1961. Infestations were present in the Cypress Hills, the Loon Lake area of north central Alberta and along the Slave, Mackenzie and Liard rivers in the Northwest Territories. The larch sawfly, Pristiphora erichsonii (Htg.) caused severe defoliation to tamarack in north central and northern Alberta and the adjacent Northwest Territories. In the eastern region south of Lake Athabasca many of the tamarack produced almost no new shoots and very short foliage as a result of defoliation over the last few years.

The Aspen leaf miner, Phyllocnistis populiella Cham. increased its damage and distribution in 1961. It could be found in almost all the aspen stands in the province and along the rivers in the Northwest Territories. Heaviest damage was along the Mackenzie river valley where whole hillsides shone silver in the sun.

The yellow-headed spruce sawfly, Pikonema alaskensis (Roh.) caused less damage in shelterbelts in 1961 than in 1960, but occurred in small pockets along the Slave River and the Yellowknife Highway where it caused moderate to severe damage. The fall cankerworm, Alsophila pometaria (Harr.) and Adelgid gall aphids caused less damage than in 1960.

In Calgary the lilac leaf miner Gracilaria syringella (Fab.) and a leaf mining sawfly believed to be Fenusa pusilla Lepeletier caused considerable damage. The rusty tussock moth Orgyia antiqua (L.) was also troublesome.

Northern Alberta

By

M. W. McFadden
University of Alberta
Edmonton, Alberta

Alberta experienced one of the driest years in recent times in 1961. Fortunately the conditions in northern Alberta were not as severe as in other portions of the province. The winter months produced enough snow to keep the soil moist during the spring months. The damp soil and the hot weather which followed caused many insects to appear in great numbers all through the summer and early fall.

Household and Stored Products Pests

The clovermite, Bryobia praetiosa Koch, continued to be the most persistent pest in the Edmonton area. Several hundred reports were received, most of which were concerned with how to prevent the mite from getting into the house.

Numerous coleopterous pests were reported including: carpet beetles with 21 reports; the saw-toothed grain beetle, Oryzaephilus surinamensis (L.), with five reports; the yellow mealworm, Tenebrio molitor (L.), and a flour beetle, Tribolium destructor (Wyttemb.), each with three reports; the larder beetle, Dermestes lardarius (L.) with four reports; and one report each for the black vine weevil, Brachyrhinus sulcatus (F.), which was reported from ham; the confused flour beetle, Tribolium confusum (Duval); the drug store beetle, Stegobium paniceum (L.); and the merchant grain beetle, Oryzaephilus mercator Fauv.

Several reports were received on camel crickets, Ceuthophilus spp., which were found in the basements of private homes. Several different species of tropical roaches were reported again this year, all were found in bananas in local stores. The German cockroach, Blatella germanica (L.), was reported only once, the record coming from Edmonton.

Other pests reported were: the Indian meal moth, Plodia interpunctella (Hbn.), the Mediterranean flour moth, Ephestia kuehniella (Zell.), silverfish, clothes moths and booklice.

Medical and Veterinary Pests

Bloodworms or other chironomid larvae were reported four times, all specimens were taken from watering troughs or wells. Larvae of Oestrus ovis (L.) were reported from a sheep. The paralysis tick, Dermacentor andersoni (Stiles), was removed from an adult near the Red Deer River in the vicinity of Drumheller. An unidentified species of tick was removed from the base of a young boy's neck. Unfortunately it had been badly damaged in removing it. Reports were also received on larvae of the dipterous families Sarcophagidae (three times) and Calliphoridae (once) being removed from infants. All four larvae resulted in furuncular myiasis.

In addition to the above mentioned pests the dog flea, Ctenocephalides canis (Curt.), was reported twice; a biting midge, Culicoides sp. and a centipede once each.

Agricultural, Forest and Garden Pests

Numerous reports were received for the strawberry root weevil, Brachyrhinus ovatus (L.), the western tent caterpillar, Malacosoma pluviale (Dyar) and gall wasps. The populations of these insects seem to be increasing because of favorable weather conditions. However, reports on the spruce gall aphid, Adelges sp., have decreased since last year.

Numerous reports were also received from Edmonton gardeners on leaf rollers, pear slugs, garden slugs, nematodes and aphids.

Only one or two reports were recorded for the following insects: stink bugs; the mormon cricket, Anabrus simplex (Hald.); false wireworms; scale insects; mealy bugs; springtails; white grubs; the western turnip beetle, Entomoscelis americana (Brown); cutworms and the beet webworm, Loxostege sticticalis (L.).

WHO'S WHO

The Prizewinners:
Insect Collection
Competion

E.T. Gushel

W.C.McGuffin

P.E. Blakely
J.W. Edmunds
W.C. McGuffin

C.E. Brown

R.E.Stevenson

---

cocktail hour

Dr. & Mrs. H.J. Bhambhani

Mr & Mrs. A.A. Khan

cocktails again

Mrs. J.W. Edmunds
B. Hocking
Mrs. G.E. Ball.

Mrs. B. Hocking
G.E. Ball

the banquet

C.Davidson
and associate

Mr & Mrs. G. Goldberg.

Mr & Mrs. J. Proctor.

Mrs B.Hocking
G.E.Ball.

Miss
J.Peterson

P.E. Blakely

the banquet

N.W. Van Veen
Miss J. Shore

Mrs & Mrs
J.B. Gurba

"Hocking camraii'

the banquet

Dr. & Mrs.
W.G. Evans

NINTH ANNUAL MEETING-EDMONTON-OCTOBER-1961

WHO'S WHO (continued)

Thursday evening party	Miss. J. Shore	E.B.S. Swindlehurst	Registration G.E.Ball

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Miss R. Murdoch Miss A. Pucat	J.W. Edmunds	N.D. Holmes	Miss J.Peterson

---

F.J.H. Fredeen	J. Proctor	P.W. Riegert	P.W. Riegert A.B. Ewen C.H. Craig

---

H.J. Bhambhani	W.G. Evans	D. Happold	A.M. Harper H.F. Cerezke A. Mansingh

---

B. Hocking	Miss A.Pucat Miss J. Peterson M.J. Reddy D. Happold		R. Madge	G.Pritchard D. Stelfox

---

G.A. Hobbs	W.O. Nummi	K.R. Degner	A.A. & M.A. KHAN	A.M.Harper A.J. McGinnis

---

N.W. Van Veen	C.E. Lilly L.K. Peterson A.M. Harper	N.E. Kloppenborg	L.A. Jacobson

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ENTOMOLOGICAL SOCIETY OF ALBERTA

SOCIETY BUSINESS

Minutes of Executive Meeting, May 3, 1961

Minutes of an executive meeting held in the Biological Sciences Building, University of Alberta, Edmonton, Alberta, May 3, 1961.

Present were: J. Edmunds, E. Swindlehurst, M. W. McFadden, W. G. Evans, J. C. Shore.

1. Entomological Society of Alberta Prize:

Gordon Pritchard was approved as recipient of this award.

2. Annual meeting:

Tentatively set for October 27 and 28.

Suggested local arrangements committee - J. Gurba, J. Brown, D. Stelfox.

Suggested program committee - Dr. G. E. Ball, M. W. McFadden, E. Swailes (Lethbridge) C. E. Brown (Calgary)

The secretary was requested to write to the above people and ask that they participate on this committee.

Speakers - The President is to write to Mr. P. Blakeley re: anyone coming from Ottawa at the time of the meeting.

Dr. B. Hocking was suggested.

Place - Kingsway Motor Hotel. J. Edmunds to make arrangements.

3. Collecting trips:

The secretary was requested to write to Calgary and Lethbridge and inform them that they would be responsible for arranging their own trips.

Edmonton Collecting Trip - To Bill McEwen's. About 20 miles out of town. After mid-June. Arrangements to be made by J. Edmunds.

4. Collecting Competition:

Date of close-off of collections - October 14.

Notices: Mimeographed. Sent to Alberta Teacher's Magazine, "Woodsmoke" (Canadian Girl Guide Publication), 4-H people and A. Deschamps.

5. Honorary degree for Mr. Seamans:

The President is to write a letter inquiring about the progress made on this and direct the inquiry to Dr. Johns, President of the University of Alberta.

Joan Shore
Secretary

J. W. Edmunds
President

Minutes of Executive Meeting, October 26, 1961

Minutes of an executive meeting held in the Kingsway Motor Hotel, Edmonton, Alberta on October 26, 1961.

Those present: J. Edmunds, E. Swindlehurst, J. C. Shore, H. Cerezke, W. O. Nummi, L. A. Jacobson, W. G. Evans, J. Gurba, J. Brown.

1. Registration fee:

After a discussion the following registration fees were set -

Registration fee: $3.00 (one banquet ticket included).
Banquet ticket for wives: $2.00 each.
Students fee: $3.00 (one banquet ticket included), $1.00 dues.

Three technicians from Lethbridge: E. Gushel, W. O. Nummi, and N. Kloppenborg, will have their registration fees waived.

The visitors from Saskatchewan would be charged the same registration fee as Albertans but would not have to pay the Society membership fee.

2. Joint Meetings with the Entomological Society of Saskatchewan.

L. Jacobson moved: "At this time, the executive will not entertain the suggestion of amalgamation with any other regional society because of the reduction in membership attending meetings and of difficulties in attending in another province for a majority of our members".
W. O. Nummi seconded this motion. CARRIED

In the discussion which followed it was pointed out that nearly all members of the Saskatchewan Society are in Saskatoon and Regina whereas in Alberta, three centers supply the members - Edmonton, Calgary, and

Lethbridge. It is for this reason that the Saskatchewan society has had a difficult time getting on its feet.

Restrictions are put on the travel of Federal Government employees, except for attending Scientific Congresses, and the meetings of the Entomological Society of Alberta are not classed as a Scientific Congress. If the societies start holding regional meetings, Manitoba would have to be included. And, if the meetings become regional, only three or four members from the Federal government service would be permitted to attend.

3. Zoological Record.

It was moved by W. G. Evans and seconded by J. Edmunds that we pay $10.00 to the Zoological Record.

4. Nomination and Appointing of Committees.

The following committees were appointed:

Resolutions committee: W. C. McGuffin (chairman)
P. Blakeley
D. Stelfox

Nominations committee: G. E. Ball (chairman)
C. E. Brown
L. A. Jacobson

Collection Competition Judging Committee: B. Hocking (chairman)
R. B. Madge
C. E. Lilly

5. Entomological Society of Alberta Prize.

Gordon Pritchard was announced as the winner.

6. Mr. W. O. Nummi thanked the executive on behalf of himself, Mr. N. Kloppenborg and Mr. E. Gushel for the help they had received by the society waiving their registration fees. He was asked to thank the members as a whole at the meeting the next day.

7. Reports to be presented at the meetings Friday and Saturday.

Membership: as of two weeks before annual meeting.

Treasurer's report: monies on hand, disbursed, etc., and how many members have paid this year.

Library Committee: Library is in Calgary.

"Insect Collector's Guide" revisions committee: nothing to report.

8. Judging of Insect collections in competition:

Friday night or Saturday morning and the report will be given at the Saturday morning meeting.

9. Appointment of Auditors.

J. B. Gurba, D. Stelfox were appointed by the executive.

10. New Business

It was moved by L. A. Jacobson and seconded by E. Swindlehurst that the records and the library of the society, if convenient, should be placed in the Department of Entomology at the University of Alberta at Edmonton. CARRIED

The meeting was adjourned on a motion by W. G. Evans.

Joan Shore
Secretary

J. W. Edmunds
President

ENTOMOLOGICAL SOCIETY OF ALBERTA

Minutes of the Ninth Annual Meeting

Kingsway Motor Hotel, Edmonton

October 27, 1961

The meeting was opened by the President, J. W. Edmunds.

1. The minutes of the previous annual meeting were read by the secretary and moved adopted as read by G. E. Ball, seconded by A. M. Harper. CARRIED

2. G. E. Ball read a letter from the University of Toronto Press telling this society of a book recently published by them, entitled "The Cicindelidae of Canada", written by J. B. Wallis.

3. The secretary read a letter from the Entomological Society of Manitoba informing this society of its annual meeting.

4. The secretary read a letter from the Entomological Society of Saskatchewan which dealt with the subject of a joint meeting of the two societies in 1963. It was announced that discussion of this proposal would take place under "new business" on Saturday, October 28.

5. Treasurers report.

   This was an interim report and was not adopted.

   Membership - 68 members on books.

   It was moved by J. Gurba and seconded by G. E. Ball that the financial report for the previous year be adopted as published in the "Proceedings". CARRIED

6. Library committee.

   No report at this time.

7. Insect Collection Competition Judging Committee.

   Will report on Saturday.

8. Entomological Society of Alberta Prize.

   Dr. W. G. Evans introduced the winnter of the Prize, Gordon Pritchard to the meeting.

9. Insect Collectors Guide.

Dr. G. E. Ball reported no progress on this publication but he would have something definite to report at the next annual meeting.

10. Committees for this meeting.

The committees nominated by the executive at their meeting were read out to the membership and the people nominated accepted the positions.

11. New Business.

(i) Honorary Degree for Mr. H. Seamans

Reported on by the President. The University has not been able to award the degree up to this time.

It was suggested that a letter go to the President of the University of Alberta from the society re-affirming this proposal and that it be presented as a resolution on Saturday.

(ii) Library and Archives.

The motion from the executive meeting immediately previous to this meeting was read to the membership. A discussion took place on this motion and any action was post-poned until Saturday.

(iii) Historical Committee.

The possibility of such a committee was discussed. It was suggested by G. E. Ball that this could be done by the executive. Dr. Hocking suggested that it could be added to the duties of editor.

(iv) It was moved by W. G. Evans and seconded by E. Swindlehurst that the records of the society be placed in the Department of Entomology, University of Alberta, except for the immediate past year which will go to the present incumbent of the secretarial position. CARRIED

(v) W. O. Nummi expressed sincere thanks on behalf of himself and N. Kloppenborg and E. Gushel for the financial aid they received from the society.

The meeting was moved adjourned (recessed) until 11:10 am., October 28. by P. E. Blakeley.

Joan Clare
Secretary

Jas Edmunds
President

October 28, 1961

The second section of the business meeting was opened by the President.

1. The President announced that the insect collections entered in the competition could be viewed in Room 250 of the hotel. He stated that they made up one of the best sets of collections ever entered in the competition.

2. Joint meetings with the Entomological Society of Saskatchewan.

After a lengthy discussion the following motion was put forward:

It was moved by E. Swailes and seconded by A. B. Ewen that joint meetings be set up on an invitational basis by the two societies in order to make joint meetings easier to arrange. CARRIED

3. Nominations Committee report.

The following executive for the coming year was presented by Dr. G. E. Ball who moved that this slate be adopted, seconded by Dr. B. Hocking who moved that nominations cease. CARRIED

President	N. W. Van Veen (Calgary)
Vice-President	N. Holmes (Lethbridge)
Secretary	W. C. McGuffin (Calgary)
Treasurer	R. Shepherd (Calgary)
Editor	R. W. Reid (Calgary)
Directors	A. J. McGinnis (Lethbridge)
	G. Pritchard (Edmonton)
	R. Hartland-Rowe (Calgary)

4. Resolutions Committee report.

The report of the Resolutions Committee was read and moved adopted by W. C. McGuffin, seconded by A. Harper. CARRIED

WHEREAS the accommodations and arrangements provided for the meetings, banquet and insect displays have been very satisfactory,

BE IT RESOLVED THAT a letter of thanks be sent to the management of the Kingsway Motor Hotel by the secretary.

WHEREAS the financial assistance given to the Society by the following firms: Cyanamid of Canada Limited, Shell Oil Company of Canada Limited, Ortho Agricultural Chemicals Limited, Later's of Canada Limited, Dow Chemical of Canada Limited, Oliver Chemicals, Allied Chemical Services, Niagara Brand Chemicals, Green Cross Products, and Chipman Chemical Limited, have contributed materially toward the success of the meeting,

BE IT RESOLVED THAT a letter of thanks be sent to each of the firms by the secretary.

WHEREAS several years have passed since this Society proposed Mr. H. L. Seamans as a candidate for an honorary Doctor's degree by the University of Alberta,

BE IT RESOLVED THAT this Society re-affirm this proposal and instruct its secretary to write the University requesting early and favorable consideration of this proposal.

WHEREAS the local Program and arrangements committees have done an excellent job in arranging and conducting an excellent and varied program, not only of research and study but also of entertainment for all of those present,

BE IT RESOLVED THAT a sincere vote of thanks be tendered to those committees.

WHEREAS the Executive and Standing Committees have conducted the affairs of this Society in a most satisfactory manner during the past year,

BE IT RESOLVED THAT a sincere vote of thanks be tendered to them.

Signed by D. Stelfox, P. E. Blakeley, W. C. McGuffin.

5. 1962 Meeting.

It was moved by G. E. Ball and seconded by N. W. Van Veen that the 1962 meeting be held in Calgary. CARRIED

6. Library.

It was moved by A. M. Harper and seconded by E. Gushel that the library of the Society be kept in the Forest Biology Laboratory in Calgary. CARRIED

7. Judging Committee, Insect Collection Competition.

Senior Division:	First Prize	Joseph Shorthouse (Lethbridge)
	Second Prize	Kenneth Richards (Lethbridge)
	Third Prize	M. S. Carleton (Lethbridge)

Junior Division: Because the new regulations do not allow joint entries, the committee could not award any prizes.

Challenge Competition: David J. Larson. For a collection of insects which spend part of their lives in water.

Recommendation: Challenge next year be: Galls, gall formers and inhabitants.

The committee commented on the small number of collections entered and the fact that all the prizes went to Lethbridge.

By a vote of a show of hands, the membership approved the topic for the challenge competition for 1962.

8. Progress on "Butterflies of Alberta".

Mr. Van Veen reported that he and Mr. Anderson have started to make reports on the butterflies found in Alberta and have found a man to make pictures for them. They have approached the Glenbow Foundation and have not had much progress here in getting the book financed.

Dr. G. E. Ball suggested that the Society give careful consideration to financing at least part of the expense of this book. The matter should be taken up by the executive.

On a question from Mr. Edmunds, Mr. Van Veen said that the Government of Alberta had not been approached on financing this book, as was done in the case of "Birds of Alberta". The question had been discussed but no decision had been made as yet. He said the difficulty lay in the fact that a book on the insects of Alberta would probably have more appeal. Dr. G. E. Ball commented that a "first-class" job could not be done on the "Insects of Alberta" but could be done on the "Butterflies of Alberta".

Van Veen: "Mention should be made of the more common insects".

The following motion was then presented: It was moved by Dr. B. Hocking and seconded by G. E. Ball that the Society reconfirm its interest in this publication on the butterflies of Alberta and that in 1962 the executive actively seek money for financing it. CARRIED

9. Cyanamid of Canada Scholarship.

   Dr. W. G. Evans announced that this award was made for one thousand dollars and that Mr. Ajai Mansingh was the recipient. He then introduced Mr. Mansingh.

10. The chairman of the program committee, Dr. G. E. Ball, thanked the speakers for the papers they had presented and also for adhering so closely to the schedule. He thanked his committee for the fine work they had done and he also thanked Mr. D. C. D. Happold for handling the projectors.

11. Dr. G. E. Ball thanked the Saskatchewan people for coming to our meetings. They in reply thanked the Alberta Society for allowing them to attend.

12. In closing, the President welcomed the incoming executive and thanked his executive for the manner in which they had carried out their work.

The meeting was moved adjourned by A. M. Harper.

Joan Shore
Secretary

J. W. Edmunds
President

Financial Statement for the Year ending December 31 - 1961

Receipts

Bank Balance January 1 - 1961		500.01	
Membership Fees			
Ent. Soc. Alberta 1960	6.00		
1961	60.00		
1962	55.00		
Receipts No. 6 and 10	0.22	121.22	
Ent. Soc. of Canada 1960	6.00		
1961	78.00		
1962	96.00	180.00	
Annual Meeting			
Contributions from Industry		165.00	
Registration		181.00	
TOTAL RECEIPTS			1,147.23

Disbursements

Ent. Soc. of Canada		180.00	
Competition prizes	12.40		
University of Alta. award	50.00		
Zoological Record	10.25		
Student Travel Assistance	8.00		
Printing & Stationery	135.68		
Postage Secretary	6.50		
Treasurer	2.81		
Bank Charges	5.40	231.04	
Annual Meeting			
Banquet Refreshments	70.00		
Banquet & Hall Rent	260.70	330.70	
TOTAL EXPENDITURES			741.74
BALANCE - BANK DRAFT - SOCIETY			405.49
			1,147.23

Audited and found correct
February 9, 1962

J. G. Gurba D. Stelfox

J B Gurba D. Stelfox

E. B. Swindlehurst

E. Swindlehurst,
Treasurer.

MAILING LIST, 1961-62*

Members

	Anderson, Mr. R. L.	Field Titles Service, Royalite Building, 11 Hunter Street, Calgary.
	Archibald, Mr. J. G.	Alberta Department of Agriculture, Court House, Lethbridge.
*	Ball, Dr. G. E.	Department of Entomology, University of Alberta, Edmonton.
*	Bhambhani, Dr. H. J.	Department of Entomology, University of Alberta, Edmonton.
*	Blakeley, Mr. P. E.	Research Station, Canada Agriculture, Lethbridge.
	Broadfoot, Dr. W. C.	Research Station, Canada Agriculture, Lethbridge.
*	Brown, Mr. C. E.	Forest Biology Laboratory, 102 - 11th Avenue South East, Calgary.
	Brown, Mr. J. H.	Provincial Entomologist, Alberta Department of Public Health, Edmonton.
	Carr, Mr. J. L.	R. R. 4, Calgary.
*	Cerezke, Mr. H. F.	Forest Biology Laboratory, 102 - 11th Avenue South East, Calgary.
	Chisholm, Mrs. R.	14716 - 108 Avenue, Edmonton.
	Church, Dr. N. S.	Research Station, Canada Agriculture, Lethbridge.
	Clancy, Mr. D. N.	92 Westview Drive, Calgary.
*	Cook, Mr. A. J.	Forest Biology Laboratory, 102 - 11th Avenue South East, Calgary.
*	Craig, Mr. C. H.	Research Station, Canada Agriculture, University Sub-Post Office, Saskatoon.
*	Davidson, Mr. C.	11305 University Avenue, Edmonton.
*	Depner, Mr. K. R.	Research Station, Canada Agriculture, Lethbridge.

(* Paid up members)

*	Doane, Mr. F. J.	Research Station, Canada Agriculture, University Sub-Post Office, Saskatoon.
*	Edmunds, Mr. J. W.	Supervisor of Apiculture, Alberta Department of Agriculture, Edmonton.
*	Elliot, Mr. K.	Research Station, Canada Agriculture, Lethbridge.
*	Evans, Dr. W. G.	Department of Entomology, University of Alberta, Edmonton.
*	Ewen, Dr. A. B.	Research Station, Canada Agriculture, University Sub-Post Office, Saskatoon.
	Farstad, Dr. C. W.	Director, Plant Protection Division, Production and Marketing Branch, Canada Agriculture, K. W. Neatby Building, Carling Avenue, Ottawa.
*	Fredeen, Mr. F. J. H.	Research Station, Canada Agriculture, University Sub-Post Office, Saskatoon.
*	Freitag, Mr. R.	Department of Entomology, University of Alberta, Edmonton.
*	Goldberg, Mr. G.	Niagara Brand Chemicals, 10442 - 70th Avenue, Edmonton.
*	Gurba, Mr. J. B.	Supervisor of Crop Protection and Pest Control, Field Crops Branch, Alberta Department of Agriculture, Edmonton.
*	Gushul, Mr. E. T.	Research Station, Canada Agriculture, Lethbridge.
*	Happold, Mr. D. C. D.	Department of Entomology, University of Alberta, Edmonton.
*	Harper, Dr. A. M.	Research Station, Canada Agriculture, Lethbridge.
	Hartland-Rowe, Dr. R. C. B.	Department of Zoology, University of Alberta at Calgary, Calgary.
	Haufe, Dr. W. O.	Research Station, Canada Agriculture, Lethbridge.
	Hewitt, Mr. A. G.	Research Station, Canada Agriculture, Lethbridge.
*	Hobbs, Dr. G. A.	Research Station, Canada Agriculture, Lethbridge.

*	Hocking, Dr. B.	Department of Entomology, University of Alberta, Edmonton.
*	Hodge, Mr. R.	12416 - 96th Street, Edmonton.
*	Holmes, Dr. N. D.	Research Station, Canada Agriculture, Lethbridge.
	Hopkins, Mrs. M. E. P.	Forest Biology Laboratory, 102 - 11th Avenue South East, Calgary.
	Hopping, Mr. G. R.	Forest Biology Laboratory, 102 - 11th Avenue South East, Calgary.
	Hurtig, Dr. H.	Associate Director, Research Branch, Canada Agriculture, K. W. Neatby Building, Carling Avenue, Ottawa.
*	Jacobson, Mr. L. A.	Research Station, Canada Agriculture, Lethbridge.
*	Kirdeikis, Mr. A.	Provincial Entomologist's Office, Alberta Department of Public Health, Edmonton.
*	Khan, Mr. A. A.	Department of Entomology, University of Alberta, Edmonton.
	Khan, Dr. M. A.	Research Station, Canada Agriculture, Lethbridge.
*	Kloppenborg, Mr. N. E.	Research Station, Canada Agriculture, Lethbridge.
*	Knight, Mr. D.	Box 997, Vegreville, Alberta.
	Larson, Dr. Ruby I.	Research Station, Canada Agriculture, Lethbridge.
*	Lilly, Mr. C. E.	Research Station, Canada Agriculture, Lethbridge.
	Lindsay, Mr. I. S.	Environmental Protection, Defence Research Board Headquarters, Ottawa.
	Longden, Mr. J. A.	610 - 15 Avenue South West, Calgary.
	MacDonald, Dr. M. D.	Research Station, Canada Agriculture, Lethbridge.
	McDonald, Mr. S.	Research Station, Canada Agriculture, Lethbridge.
*	McEwen, Mr. W.	R. R. 1, Ardrossan, Alberta.

*	McFadden, Mr. M. W.	Department of Entomology, University of Alberta, Edmonton.
*	McGinnis, Dr. A. J.	Research Station, Canada Agriculture, Lethbridge.
	McGregor, Dr. H. A.	11406 - 66th Street, Edmonton.
*	McGuffin, Dr. W. C.	Forest Biology Laboratory, 102 - 11th Avenue South East, Calgary.
*	Madge, Mr. R.	Department of Entomology, University of Alberta, Edmonton.
*	Mansingh, Mr. A.	Department of Entomology, University of Alberta, Edmonton.
*	Murdoch, Miss Rita	Department of Entomology, University of Alberta, Edmonton.
	Nelson, Dr. W. A.	Research Station, Canada Agriculture, Lethbridge.
	Newgard, Mr. B.	627 North Avenue East, Missoula, Montana.
*	Nummi, Mr. W. O.	Research Station, Canada Agriculture, Lethbridge.
	Painter, Mr. R. H.	Livestock Insect Liaison Officer, c/o Research Station, Canada Agriculture, Lethbridge.
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	Pelham, Mr. W. L.	Research Station, Canada Agriculture, Lethbridge.
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