

Proceedings of the Twelfth Annual Meeting

of the

ENTOMOLOGICAL SOCIETY

of

ALBERTA



Edmonton, Alberta

October 30th, 31st, 1964

Proceedings of the
ENTOMOLOGICAL SOCIETY OF ALBERTA

Volume 12

October, 1964

OFFICERS - 1964

President	William G. Evans
Vice-President	R. C. B. Hartland-Rowe
Secretary	F. J. D. McDonald
Treasurer	Janet Sharplin
Directors	R. E. Stevenson Joan Shore J. Weintraub
Regional Director (E.S.G.)	L. Jacobson

Editor - P. J. Procter

THE TWELFTH ANNUAL MEETING

The Twelfth Annual Meeting of the Entomological Society of Alberta was held October 30 and 31 at the Kingsway Motor Hotel, Edmonton. Some 65 members registered and attended the presentation of the papers and business meetings.

Highlights of the meeting were the invitational paper presented by Dr. F. G. Couch of Canada Wildlife Service, and the guest speaker of the annual banquet Friday, Mr. A. J. McGregor. Using information researched for his books on Alberta history, Mr. McGregor provided an entertaining and factual account of some of Alberta's "early days".

The judging of the Annual Insect Collection Competition took place on October 31. Due to the few entries there was some question whether this competition should be continued in the future.

CONTENTS

	Page
The Twelfth Annual Meeting	
Presidential Address	1
Invitation Paper: Wildlife - Insecticide Relationships	
- F. G. Cooch	3
Abstracts of Paper Presented	
The effect of dieldrin sprays on aquatic organisms - W. A. Charnetski	9
Destruction of wildlife by dieldrin sprayed against tsetse fly in Ngamiland - P. Graham	9
Changes in susceptibility of Colorado potato beetles to DDT - S. McDonald	10
S Some amino acid requirements of the Warble fly - R. Kasting and A. J. McGinnis	10
Utilization of dietary nitrogen by the two-striped grasshopper - A. J. McGinnis and R. Kasting	11
Aphid chromosomes - A. M. Harper and M. D. MacDonald	11
Tale of <u>Tabula</u> - R. B. Madge	12
The biology of <u>Agrotis orthogonia</u> Morrison from various geographic areas - L. A. Jacobson	12
Advanced studies of <u>Danaus plexippus</u> - J. D. Shorthouse ...	13
Fairy shrimps in Alberta sloughs - R. Hartland-Rowe	13
Photographing aphid galls - E. T. Gushul	14
The "La France" timed-interval insect trap - its construction and uses - A. Nimmo	15
High Arctic Biology - R. E. Leech	15
Grubby Pearl - B. Hocking	16

Symposium: Pests and Pesticides, Alberta 1964

Household and garden pests in northern Alberta - J. R. Barron ..	17
Agricultural pests in southern Alberta - P. E. Blakeley	17
Agricultural pest control - J. B. Gurba	18
Forest pests - C. E. Brown	19
Insecticides in Alberta from the viewpoint of industry - G. Goldberg	19

Biographies of New Honorary Life Members

G. R. Hopping	21
R. H. Painter	22

Pictorial Highlights - E. T. Gushul	24
---	----

Society Business

Minutes of the Twelfth Annual Meeting October 30 and 31, 1964 ..	28
Treasurer's Report	36
Financial Statement for Year Ending January 1965	36
Mailing List 1964-65	38

PRESIDENTIAL ADDRESS

Professionalism and Entomology
William G. Evans

One of the prerogatives of being President is that, essentially, any subject may be chosen for the presidential address in contrast to the more restricted and technical papers given at the meeting by the members. This opportunity, then, allows me to pass on to you some of my ideas concerning the present trend among scientific societies to promote professionalism so as to exclude from membership and participation certain members who may make substantial contributions to knowledge.

In 1962 you heard an address from Mr. N. W. Van Veen, who was president of this society at that time and who is not a professional entomologist. He gave his views on the role of amateur entomologists and the contributions that these amateurs have made to entomology as well as other fields of science. And I agree wholeheartedly with his statement that: "entomology needs this kind of information" (provided by amateurs).

I was therefore quite concerned this past year when I came across an article in the Bulletin of the Entomological Society of America entitled "Professional Training, Standards and Status for Entomologists" (W.D. Reed, Volume 10 (2): 93-94. 1964). Since I am, primarily, a teacher I have no quibbles concerning the efforts to improve the training of entomologists, but I actively oppose the restriction of membership in entomological societies to (quote from the above article) "those who are honorary, life, professional and student". Unless, of course, the particular society becomes so specialized in its objectives, such as in the purely applied aspects of entomology where there is essentially no participation by amateurs. In this case, it would be unfortunate, indeed, to have such a restricted outlook on the "study of insects".

A great number of amateurs in the past have added immensely to our knowledge of insect taxonomy, genetics and zoogeography as well as to life histories and habits. Even today we need the help of these non-professionals and luckily we are still getting it. I need only mention Rump and his work on tiger beetles in California, Ricker who is an authority on the western Plecoptera, and Hoffman, though working primarily

on millipedes, who also is an excellent insect taxonomist. There are so many insects yet to be described and so little we know of the vast majority that are named that we need all the help we can get. I therefore want to state for the record of the Proceedings of the society that we need amateurs and we should encourage them as much as we can. Perhaps in the future this current attempt by many scientific groups to obtain status will have subsided but, if not, our thoughts have been expressed today and I say "our" because I am certain you all agree with me.

INVITATION PAPER

Wildlife - Insecticide Relationships

by F. G. Cooch

Peaceful co-existence has been proposed in some quarters as the only way in which opposing forces can avoid mutual destruction. In one way, that is a description of an ecosystem.

In recent years there has been an increasing awareness among ecologists that a gentle prod of the ecosystem in one place frequently erupts as a kick somewhere else. We all tamper with the ecosystem - the forest entomologist, the agricultural entomologist, the insect taxonomist, the fish and wildlife biologist. Seemingly, the longer we have been divorced from formal education, the further many of us have drifted away from acknowledging even the existence of an ecosystem that an ecosystem even exists.

Many entomologists are directly involved with insecticides, with spray calendars, with grasshopper control. You, like me, generally work for an agency. You, like me, get orders. You, like me, carry them out. In your case, perhaps, the orders are to test the efficacy of organophosphate "x" against Hemlock looper, or balsam woolly aphid, or to control an outbreak of spruce budworm, army cutworm, or grasshoppers. The emphasis is to get the job done, control that insect. That is your job, and in doing it you may tend to disregard your ecological conscience. In the heat of getting the job done there may be a tendency for us to lose sight of the omnipresent ecosystem, to which during some part of our careers we have all paid at least lip service. Entomologists have been working in their own little compartments; so have the foresters. Because I work with natural wild populations I believe that fisheries biologists and wildlife biologists have had to keep the ecosystem more constantly in mind. Perhaps what we need is a hot line.

What I have just said may be unpalatable to some; I know it is unpalatable to me. No longer can an expert on Carabids or an expert on the avian genus Anser, working on isolated segments of the ecosystem, afford to be oblivious of the consequences of the prods at the ecosystem that may end up as a kick somewhere else, perhaps miles away and seemingly unrelated.

Why all the fuss? Is there really a problem? Must we indeed have an ecological conscience? Perhaps a few examples of what concerns wildlife and fisheries biologists might be useful at this time. Let me make one thing clear; professional fisheries and wildlife biologists are not out to "get" anyone. We fully recognize the usefulness of insecticides. Our quarrel is with the amounts and kinds of pesticides

used. Above all, we are concerned that in many instances little thought appears to have been given to other components of the ecosystem.

You are the first natural scientists who use these compounds after they have come out of the alchemists' chambers. You are the first to introduce them into the ecosystem. The responsibility which you bear at that time is, to me, awesome. It is expected of you, perhaps unfairly, by workers in other fields of natural science that following a pesticide's introduction, you will have more than an educated guess as to the eventual impact of that toxicant on the insect component of the ecosystem - especially data on food chains, a field of endeavour with which you are, of all Natural Scientists, best able to cope. At present I'm sure that this is a pious expectation. I might add that wildlife and fishery biologists also should be very aware of the impact of insecticides on their segments of the ecosystem. At present, probably that is also a pious expectation, but it is coming closer to reality.

The tale of the conflict between wildlife and fisheries and insecticides in Canada, on the prairies, in fact here in Alberta, is a dreary one. I am referring to the grasshopper control problem and the use of one or two ounces of dieldrin per acre. True, dieldrin kills grasshoppers; it has other good qualities too: it is cheap, stable, and persistent, and I suppose relatively safe for the average farmer to use. Furthermore, ample supplies were available. The program is now generally over, but wildlife interests must live with the consequences, perhaps for the next 10-15 years. Why the concern? Persistence. Evidence from United States Department of Agriculture study areas in Mississippi and Arkansas show that even after dieldrin can no longer be detected in pond water it remains in the silt and bottom detritus to be recirculated or available to plankton. Evans and Charnetski, University of Alberta, are presently investigating the dieldrin - concentrating ability of certain aquatic insects - Dytiscids, Chironomids, etc. So what? Dytiscids and Chironomids are prime duckling food. Dieldrin not only kills ducklings, but also reduces fecundity of adults. The Canadian Wildlife Service is considering an extensive land acquisition program to save potholes and marshes from drainage for waterfowl breeding and hunting areas. We are now faced with a dilemma. Should we save a particular pothole if it has a dieldrin content, or let it be drained and lost forever? Do we have to check dieldrin levels in every pothole before acquiring it, or do we take a chance? Frankly, we do not yet know for certain if a problem exists. We must be prepared! We have some preliminary data which is indicative but limited. No one will argue that it was important to the Canadian economy to control grasshoppers. Nor I suppose can we argue against the use of dieldrin in the first year of the program. We do argue about the continued use of that chemical in the

face of the evidence of persistence, or apparent systemic activity in wheat, of subsequent presence in milk, butter, feed, livestock, and of possible damage to migratory waterfowl. We are currently analyzing water, soil, ducks and pheasants from Alberta for dieldrin residues.

There are many good examples of the translocation of chemicals from land or aquatic insect control into lake or river waters with subsequent losses of birds or fish. Even now, 7 years after the last application of DDT to Clear Lake, several species of aquatic birds are unable to reproduce. Then there is the DDT story in Lake George, New York, the theme of which is the total loss of reproduction of lake trout hatchery stock derived from that lake. The cause? DDT application to control blackflies and mosquitoes for the benefit of tourists. The Shuswap Lake, British Columbia, kill, the DDT - salmon kills in New Brunswick and the run-off waters from irrigated land surrounding Tule Lake are other examples.

About here I expect you are thinking that I have been referring solely to chlorinated hydrocarbons, which are rapidly becoming passe for most uses and are appearing on an increasing number of lists of proscribed formulations.

Let's look then at organophosphates and carbamates, those newer jewels in the insecticide crown. In 1964, a systemic organophosphate was used on 160,000 acres in New Brunswick during the spruce budworm reduction program. We worked very closely with the Canada Departments of Forestry and Fisheries and with Forest Protection Limited. At a rate of $\frac{1}{2}$ pound per $\frac{3}{4}$ of a U.S. gallon per acre, aimed at 4th instar budworm larvae, an apparent loss of more than 90 per cent of the bird populations occurred. We experimented further with other formulations, e.g. ($\frac{1}{2}$ lb./ $\frac{3}{4}$ U.S. Gal./acre plus a penetrant) and the resulting bird losses were much reduced. We don't know yet whether climatic factors caused the difference in results or whether the amelioration in effect was due to the penetrant. We will be testing the latter possibility in 1965.

I submit as proof that the Canadian Wildlife Service is not entirely unreasonable with regard to insecticide use the sequence of events which occurred in New Brunswick in 1964. On June 1, 1964 a spray operation reduced observable bird populations on a 10,000 acre study plot by 97 per cent. Dead and dying birds were located easily by our field party, despite the piles of slash and dense forest. At the same time, dead and dying birds were also dropping on salmon fishermen in the Nashwaak River, at a church social and on homeowners' lawns. We met with the entomologists at the Fredericton laboratory and we decided that the experiment should continue despite the potential public clamour and the apparent destruction of birds. We did this in order that other formulations could be checked and above all to determine if the results of June 1st were due to chance alone. We probably could have requested and obtained a stop to the 1964 program.

We were tempted, but we felt that we needed more data on bird damage which we could get from continuing studies.

Let us go back to ecological considerations for a moment. We are now working closely with the Canada Department of Forestry in pre-use assessments of chemicals proposed for use in forest-insect control programs. We plan to review the effects on wildlife of all new insecticide chemicals under field conditions for at least one season before they are put into general use. Along with Fisheries, Forestry, and possibly National Health and Welfare, we are proposing to investigate each new chemical insecticide from the viewpoint of efficacy, spray techniques, phytotoxicity, effect on fish, bird, mammal, and insect populations, as well as on human safety. Eventually, it is our hope to do the same thing for chemicals used in large-scale agricultural programs.

There is a mistaken idea in some quarters that because most organophosphates and carbamates are readily and rapidly hydrolyzed by contact with water, that following a high initial kill, no residues are left. That is probably correct as a general statement, but some new organophosphates are exceedingly stable in alkaline or acid waters. In distilled water, one organophosphate compound with which I am familiar is completely hydrolyzed in 48 hours. But in acid waters a 5 per cent solution applied 96 hours after dilution with acid water resulted in the 1964 bird kills in New Brunswick. Further, being a systemic it showed considerable biological activity in vegetation 32 days later, and we do not yet know its effect on browsing ungulates. True, there will be no residues in 1965 such as one would expect from chlorinated hydrocarbons, but there may not be many birds left either. This result is probably more important in operations on insular areas or when small endemic subspecies are involved, both being situations where repopulation is slow or impossible to achieve.

Organophosphates and carbamates have one striking quality. As a general rule they are 20 to 100 times more toxic to birds than they are to mammals and up to a 1000 times more toxic to birds than they are to fish. One example, without naming the chemical, is OP x, which has a LD₅₀ to passerine birds of 3 mg/kg; to Rats 330 mg/kg, and to Rainbow Trout 0.21 ppm. That chemical has been recommended for mosquito control in a Saskatchewan bird sanctuary. Its effects are the avian equivalent of those of parathion to mammals. True, it kills mosquitoes and does a good job, but surely it can't be the best chemical for use in a bird sanctuary located in the middle of a city.

Carbamates, of which Sevin is probably best known, are supposed to have many of the advantages of organophosphates in addition to being less toxic to warm-blooded vertebrates. One, a molluscicide, is under study now for registration under the Pest Control Products Act.

It certainly kills slugs and is fine for greenhouse use. It has also been tested on ornamental fruits. It is fairly toxic to mammals with a LD 50 of 10 mg/kg for rats (the same as parathion) but for birds the LD 50 is 0.56 mg/kg which is the same as TEPP.

We do not know yet what effects organophosphates and carbamates will have on reproductive success in birds. We do know that sub-clinical levels in birds and humans can result in marked behavioral changes. This may in effect produce a neurotic bird which is unable to perform its innate pairing behaviour and so does not reproduce. Those birds which do pair will produce fertile eggs. Apparent reproductive success will be high. However, an unknown proportion of the birds will fail to breed but will be otherwise "normal". If you think insecticides can't affect avian behaviour, I suggest you read the work of Radcliffe on British birds. He has demonstrated that Peregrine falcons under the stress of a load of insecticides smash the eggs in their own nests. There have been recent discoveries that behavioral changes can also be detected in man.

To change the subject for a moment, an example of where a prod can turn into an unexpected kick is the irradiation of screw flies - hailed by wildlife biologists and entomologists as the ultimate in biological control. This example has been hailed everywhere, everywhere that is, except on the Edwards Plateau near Austin, Texas. It seems that the screw fly was the factor which limited deer populations in that area. Since its successful removal, deer populations have irrupted to almost Kaibab proportions. Where before one cow could be raised on five acres of range, now 40 acres are required. In 1963, 40,000 deer were removed with hardly any effect on the deer population. It would seem that you just can't win them all.

One last point before closing. There has been considerable comment from the chemical industry that some species of song birds are more common today than they were before the advent of general use of synthetic insecticides. The species most widely studied in that regard has been the robin. Claims have been made on the basis of "data" published in Audubon Field Notes that the number of robins seen per individual bird watcher during the Christmas Censuses has increased by nearly 50 per cent in the past 10 years. The ratio of bird watchers to robins is probably correct, but unfortunately is an artifact which must be disregarded because the analysis has been made out of context with reality.

Census data in Audubon Field Notes are published in two places. First, on an area-by-area basis, which is laborious reading, and secondly, in a summary which gives simple listings of number of

participants and number of birds seen (by species). Apparently the tedious process of checking the data, area-by-area was avoided by the spokesman for the chemical industry. The summaries were used instead. If the data had been checked, I believe that the paper would never have been written. The first source of error concerns the disregard for the location of the census efforts. Most new census areas since 1950 have been located within the wintering areas of robins, and in such areas observers could logically be expected to see robins. One partly in one new reporting area recently discovered a roost considered to contain 10,000,000 robins. I think that you would agree with me that the only valid comparison would be between identical samples taken in 1950 and 1960. The results would, I'm sure, take the wind out of some sails.

I realize fully that scientific information must be translated into administrative action. Perhaps our problem as scientists is one of communication, both with those who must make administrative decisions on the basis of scientific recommendations, and with the public that demands or supports those decisions; I know of several brilliant Canadian entomologists who have recently left the country because they considered that inadequate support was given to research. I refer you to the article by D.A. Chant, Vol. 43, Issue 9, September 1964, Professional Public Service. Perhaps we as scientists have a duty to stick our necks out and make ourselves heard.

In closing I want to thank you for this opportunity to discuss some of the things which concern wildlife biologists. We realize that what we are asking is a thorough investigation of the ramifications of insecticide use on a highly complex inter-relationship of animal species. We are fully aware of the pressures to which you as entomologists are subjected. In the past, some wildlife workers may have made some extravagant claims as to damage suffered by wildlife. On the other hand, apologists for insecticide use have erred equally by stressing the "universal" safety of these toxicants. I hope that you will agree with me that we need more, better, broader and co-ordinated research at all levels of insecticide use. Studies should be made of insect population parameters which may lead to weak links in an insect's life cycle. There should be further elucidation of reports by Naegle of Cornell and others of diurnal rhythm in resistance to insecticides like parathion. There must be detailed examination of the food chain, the effects of chemicals on that food chain, and the ability of some components of the food chain to concentrate PPB to several parts per million. On their part, wildlife and fisheries biologists must actively assist foresters and agriculturalists in pre-use assessments of chemicals. Equally important, they must point out areas of potential conflict. These are not easy tasks. They will be frustrating and tedious, but challenging. The important thing is that they are essential. I, for one, don't know how much poking and prodding the ecosystem can stand. I suggest that by working together, we find out and find out quickly!

ABSTRACTS OF PAPERS

The Effects of Dieldrin Sprays on Aquatic Organisms

W. A. Charnetski

A survey of literature discussing dieldrin's effects on invertebrates in a fresh water environment, as known to date, is discussed.

An investigation presently underway at the University of Alberta, Department of Entomology, will study dieldrin's effect on food chains involving aquatic plants, invertebrates, one species of fish, and possibly one species of duck, in a 4.5 acre pond.

Sampling stations, determined by water depth, will be positioned along transects. Samples of mud, water, plankton, submergent and/or emergent vegetation and insects from each station will be analysed for dieldrin content, using gas chromatography with electron capture. Random invertebrate collections, and trout from caged and uncaged populations will also be analysed. In addition to insecticides content, the mud and water will be examined so as to establish its' chemical and physical composition.

The amount of dieldrin to be added to the pond will be ascertained by a lab project determining the tolerance of various members of the food chains to the insecticide.

The Destruction of Birds and Other Wildlife by Dieldrin Sprayed against Tsetse Fly (*Glossina morsitans* Westw. Diptera, Muscidae.) In Ngamiland

P. Graham

Between February 24th and March 3rd 1964 an area of about one sq. mile was sprayed with Dieldrin T emulsion against Tsetse Fly in the Maun area of Ngamiland using a Unimog spraying apparatus. In searches carried out on the 3rd, 7th and 13th March by a gang of 100 labourers, 109 dead birds, belonging to 21 species, 12 dead mammals, including two baboons and three dead reptiles were found.

The height of the grass, between two and three ft., makes it probable that only a small proportion of the total kill was found.

Changes in the Susceptibility of Colorado Potato Beetle
to DDT in the Lethbridge area of Southern Alberta

Stuart McDonald

Resistance to DDT by larvae of the Colorado Potato Beetle, Leptinotarsa decemlineata (Say.), has been established by laboratory tests to be in excess of four-fold. Unsatisfactory control with DDT has been reported by potato growers and contact sprays at 4 pounds per acre of actual toxicant do not give economic control.

Amino Acid Requirements
of the Grub of the Warble Fly, Hypoderma bovis L.

R. Kasting and A. J. McGinnis

The indirect procedure which uses glucose-U-C¹⁴ for determining the essential and non-essential amino acids has been used successfully with several phytophagous insects that cannot be reared on chemically defined diets. This method has now been applied to the common cattle grub, Hypoderma bovis. The larvae, after removal from the backs of cattle, were injected with a solution of glucose-U-C¹⁴. The larvae were then allowed 24 hours to metabolize the radioactive substrate. The grubs were extracted, the residue was hydrolysed with hydrochloric acid, and the amino acids were isolated and purified. The level of radioactivity in each amino acid was determined.

The amino acids alanine, proline, aspartic acid, and glutamic acid contained relatively high levels of carbon-14 showing that they had been synthesized. These amino acids are classed as non-essential for the cattle grub. The amino acids phenylalanine, valine, leucine, arginine, histidine and isoleucine contained no carbon-14 and are therefore classed as essential for the cattle grub.

The amino acids glycine and serine are synthesized at a slow rate by the cattle grub, suggesting that, in contrast to other animals, these compounds must be supplied in the diet. The possibility of using analogues of these amino acids for grub control was discussed.

Utilization of Dietary Nitrogen by the Two-Striped Grasshopper

A. J. McGinnis and R. Kasting

The two-striped grasshopper, Melanoplus bivittatus, was used to evaluate the nutritional quality of pith from stems of both Golden Ball and Rescue wheat plants. The percentage utilization of dry matter from either Golden Ball or Rescue pith by the grasshopper did not account for their poor growth and development. Nitrogen utilization values were negative for those nymphs fed diets prepared from either Golden Ball or Rescue pith. Growth and development on Rescue pith was generally poorer than on Golden Ball pith. Moreover, when Rescue pith was fed to the grasshopper the percentage of fat was lower and the percentage of nitrogen was higher than in normal thrifty nymphs. These results may explain, in part at least, the resistance of solid-stemmed wheat plants to the wheat stem sawfly.

Aphid Chromosomes

A. M. Harper and M. D. MacDonald

The cytology and cytotaxonomy of aphids have been neglected in recent years owing to the lack of a quick, simple technique for preparing specimens. A Feulgen squash method that is rapid, simple, and effective has been developed to study aphid chromosomes. Accurate chromosome counts and excellent mitotic figures are obtained only 30 minutes after the removal of the embryos from live aphids. The success of the method is due to hydrolysis in 1.0 N HCl at 68°C. instead of at 60°C. as in most Feulgen schedules, and the removal of unnecessary steps such as dissection in saline solution, fixation in acetic-alcohol, and rinses in distilled water.

The chromosomes of seven species of aphids of the genus Pemphigus have been investigated. It was hoped that the cytology of these aphids would be sufficiently diverse to allow ready identification of the apterous and nymphal stages where morphological characters are of little value. All the species examined had a diploid number of 20 chromosomes and the males of P. betae Doane had 19 chromosomes. The X chromosome was one of the large ones. This investigation indicated that these species have the same number of chromosomes and that the chromosomes are similar in size.

Chromosome counts ranging from a diploid number of 4 to 28 have been made on over 30 species of Alberta aphids and for most of the species this has been the first record of their chromosome numbers.

Tale of a Tabula

R. Madge

The Tabula Synoptica, a large table with descriptions of 31 new genera of Carabidae, formed part of the Observations Entomologiques of the early Italian entomologist Franc-Andre Bonelli. With regard to the validity of the new names found in the Tabula the following points are discussed. 1) What is the place of the Tabula in the Observations? 2) Was the Tabula published withing the meaning of the International Code of Zoological Nomenclature? 3) What is the date of publication? A fourth point, the early geographical distribution of the Tabula, is also touched upon.

Geographical Variation of the Pale Western Cutworm, Agrotis Orthogonia Morrison

L. A. Jacobson

Damage by larvae of the pale western cutworm, Agrotis orthogonia Morrison, was found 10 miles north of Bruderheim, Alberta, during the 1964 season. This occurrence is considered the most northerly report of economic infestations of this insect and may represent a geographic strain. Comparisons with larvae collected at Lethbridge showed that moths from Bruderheim emerged approximately 10 days earlier and that eggs from the Bruderheim stock possessed a more intense diapause. Further comparisons in biology are in progress.

Advanced Studies of the Monarch Butterfly
(Danaus plexippus)

Joseph D. Shorthouse

Although milkweed patches were extremely abundant this year, the Monarch population was low owing to a poor spring migration. Through several transfer experiments, approximately 350 adults were tagged and released. Dr. F. A. Urquhart, University of Toronto, sent the insects in individual glassine envelopes. The envelopes contained sufficient water for the $1\frac{1}{2}$ day journey. The mortality rate in the shipment was only 1 per cent.

The exact overwintering area of the western Monarch remains unknown. All of my releases flew in a south-east direction taking advantage of the west winds. With only a few returns we will know whether they are overwintering in Texas and Mexico or in California.

A series of slides taken by E. J. Gushul, showing the complete life cycle and transfer methods followed.

Fairy-shrimps in Alberta Sloughs

R. Hartland-Rowe

The fauna of 250 pools, the majority of them temporary, was examined and measurements taken of pH and conductivity, the latter being a useful rough guide to the concentration of dissolved salts; 100 conductivity units corresponds to about 60 mg./litre of dissolved salts.

The pH ranged from 7 to 11, and the conductivity from less than 100 to more than 118,000 units. 88% of the pools had conductivity values below 10,000 units.

Chemical analyses of 30 samples revealed the following ranges of ionic concentrations in mg./l.: Magnesium: 1-7364; Calcium 1-623; Sodium plus Potassium: trace -50, 50718-718; Chloride: 0-12, 12180-180; Sulphate: 21-44, 44583-583; Carbonate plus Bicarbonate (as Carbonate): 50-10, 10950-950. The lowest concentration of dissolved solids was

142 mg./l. and the highest 99,760 mg./l.

In 16 temporary pools examined, sodium was the predominant anion in 10, calcium in 2 magnesium in 1: the other two were mixed. Nine were 'carbonate' type pools, five were 'sulphate' type and the other two were mixed.

The ten species of fairy-shrimps (Crustacea Anostraca) recorded fall into three categories according to their salinity preferences: low salinity types, high salinity types, and versatile types. One genus, Branchinecta, includes species in each of the three categories.

How to Photograph Aphid Galls

Evan T. Gushal

Good lighting is the most important factor in photographing aphid galls. When galls are placed on a white background, conventional forms of floodlighting create shadow patterns that distort the true appearance. In the fall itself the deep crevices photograph as black shadow areas and the outline is replicated so strongly on the background that it appears to be a continuation of the subject.

When an electronic flash ring illuminator is used, it lightens the black shadow areas but creates an objectionable dark outline completely around the subject. It also causes reflections from any glossy leaf surface that is at right angles to the optical axis.

The objectionable shadows can be reduced or eliminated by placing the subject on an X-ray film illuminator, or by supporting the subject with a glass plate that is some distance from the background. These methods, however, do not preserve the detail in the gall and permit the reflections of the lamps to come into the picture area, when they are moved close to the camera.

Black velvet eliminates background shadows but creates objectionable crevice shadows in the subject itself.

The simplest solution to these problems is to photograph galls in a greenhouse. Overcast days provide perfect conditions, but on a sunny day a shaded area must be used. This soft diffused light is ideal for black and white as well as for daylight color film.

When it is necessary to work with artificial lights, a tent system is very satisfactory. White nylon cloth or white paper attached to a suitably supported wooden or wire framework is used to diffuse the light. Lamps are directed at the outside of the tent material and soft diffused light is produced. Further control over shadows is possible by altering lamp height and distance from the tent. When using this method, type 'A' color film gives excellent results, but black and white film requires careful exposure and slightly longer developing time.

The La France Timed-Interval Trap - Its' Construction and Uses

A. Nimmo

The trap described was designed and built at the Canada Department of Agriculture laboratory, St. Jean, P.Q., by Mr. La France, technician.

It was obtained on loan by Dr. P. S. Corbet, for use on the "Shadfly Project", an investigation into potential aquatic insect nuisance at the 1967 Montreal World's Fair site on Ile Ste. Helene, in the St. Lawrence River.

The trap was used to examine the arrival at an artificial light, from just before sunset to after sunrise, of aquatic insects. Catches were 90%, or more, Trichoptera. As many as 27,000 - 28,000 have been taken in one hour. A definite peak was found just after sunset, with little evidence of a morning peak.

The trap itself was described - the method of timing the change of containers, with no disturbance to the continuous arrival of insects, either physical or chronological. The artificial light used was an 'Ozram', 125 watt, High Pressure Mercury Vapour bulb, rich in ultra-violet.

High Arctic Biology

R. E. Leech

Biological studies were begun at Lake Hazen, Ellesmere Island, N.W.T. in 1961, under the direction of Dr. D. R. Oliver, Entomology Research Institute, Ottawa. Detailed studies have been carried out

each summer since then, in the fields of botany, nematology, arachnology, entomology, ornithology and mammalogy.

Numbers of species of selected taxa in the Luke Hazen area are as follows:

<u>Group</u>	<u>Number of species</u>
vascular plants	115
Arachnida	70 (Araneae 20; Acarina 50)
Collembola	14
Insecta	236 (incl. 141 spp. of Diptera, 59 spp. of Hymenoptera)
Pisces	1 (arctic char)
Aves	18
Mammalia	7

Investigation is in progress on the taxonomy, natural history and zoogeography of the spiders of the Lake Hazen area, based on observations made in the field during the summers of 1963 and 1964, and on a collection of approximately 20,500 specimens, preserved in alcohol.

Grubby Pearl

B. Hocking

A brief description of Rangoon, the pearl of the Orient and of the history of its population and sewage disposal system was given. This, and war damage set the stage for a build-up in population of Culex pipiens fatigans Wiedemann to a level at which substantial transmission of Wuchereria bancrofti Cobbold from the immigrant Indian population to the native Burmese became established. The effectiveness of dimethyl phthalate as a repellent to C. p. fatigans and its toxicity to immature stages of W. bancrofti were demonstrated. A program for control was proposed which comprised five steps: education, garbage disposal, rodent control, sewage disposal, and direct mosquito control.

SYMPOSIUM - PESTS AND PESTICIDES, ALBERTA, 1964

Household and Garden Pests in Northern Alberta - J. R. Barron

The total number of reports of insect pests and damage received at the department was about the same as last year. Of the more important pests there was a decrease in reports of garden slugs, cabbage and onion maggots, and tent caterpillars; an increase in strawberry root weevils, webworms and cutworms in lawns, and bedbugs; and reports of clover mites, spruce gall aphids, woolly apple aphids, pear slugs, flour beetles, carpet beetles, cockroaches, and fleas were about the same in number as last year.

Agricultural Pests of Field Crops in Southern Alberta - P. E. Blakeley

There were rather heavy but scattered populations of both Camnula pellucida and Melanoplus sanguinipes throughout the entire area. Small localized outbreaks requiring control occurred only in the Fort Macleod and Turin areas. Approximately 7,500 gallons of poison were distributed compared to 37,000 in 1963.

Considerable damage occurred as a result of pale western cutworm. Some chemical control and reseeding were required. The army cutworm, although present in many fields, did not cause significant damage. Red-backed cutworm populations were light, mostly in parkland around Edmonton.

Wheat stem sawfly damage has increased throughout most of the sawfly area. Some fields were severely damaged.

Wireworm damage continues to be very light.

Twelve thousand acres of sugar beets were treated for control of sugar beet root maggot. Population of the pest appears to be decreasing. No damage was noted outside the treated area.

Damage to sugar beet leaves by the beet leaf-miner was very extensive--caused mostly by second generation.

Beet webworm populations were at a very low level and required control in only few fields.

Sugar beet root aphid population has increased greatly in the Taber area.

Alfalfa weevil numbers are increasing again after being very low for the past two years. Damage was again evident in some fields.

Agricultural Pest Control Programs - J. B. Gurba

The main function of agriculture is the production and supply of food. Pesticides are an important part of modern farming, along with mechanization and automation, better varieties and breeds, etc. Today we have not satisfactorily solved the problem of pests or pesticides or the production of sufficient food. We have temporary surpluses in Canada but people elsewhere go hungry or undernourished. The FAO report for 1963 shows that world food production increased 2%: on a per capita basis it dropped 1%.

In Alberta legislation for the control of farm pests is provided by the Agricultural Pests Act, naming as official pests - the coyote, Norway rat, bacterial ringrot, warble fly and grasshopper. Under this broad framework, policies and control programs are set up and money is made available. During 1964 grasshoppers continued to be our major crop threat but favorable weather and growth reduced damage. About 225,000 acres of crop were sprayed compared to approximately 1 million acres treated in each of the 3 preceding years. Dieldrin at 1 oz. actual/acre was used on cereals to the heading stage; Dimethoate at 3 oz. or Malathion at 12 oz. was used on pasture, hay and other feed crops. The latter present no known residue, give shorter lasting control and cost 4 to 7 times more than Dieldrin. Cutworms, wireworms, wheat stem sawfly (resistant varieties), flea beetles, tent caterpillars and spider mites were other pests requiring pesticide control.

The residue testing, begun on milk products in 1961, was continued and random sampling was expanded to include meats, eggs, honey, etc. to locate and define problem cases and areas. Positive cases were followed up, the cause determined and removed, and the product voluntarily kept out of food supply till free. Insecticide use recommendations have gradually changed from chlorinated hydrocarbons to phosphates and carbamates.

The pesticide controversy has resulted in extremists on both sides classifying us into 2 camps - for or against pesticides. We should not perpetuate this fallacy. Pesticides are here to stay but we have to consider all aspects, coupled with common sense, for effective and safe use. In a recent meeting in Edmonton Dr. Robert Glen stated

that we have 2 basic needs concerning pesticides:

- 1) a willingness to take certain calculated risks, and
- 2) a willingness to change our minds, attitudes and plans in the light of new knowledge.

This type of philosophy has always been necessary in the gamble that is farming and applies equally well in the control of pests and the use of pesticides.

Forest Pests - C. E. Brown

There were four major forest pests in 1964: the larch sawfly, the spruce budworm, the forest tent caterpillar and needleminers of pine. Infestations of the larch sawfly have greatly decreased in Alberta but are still causing damage in the Northwest Territories. The spruce budworm is in outbreak proportions over large areas in the Northwest Territories and in a small area in northern Alberta. Infestations of pine needleminers are small, the infestation in Banff National Park is no longer at an economic level. A small but interesting outbreak of a needleminer occurred in the Cypress Hills in 1964. Populations of the forest tent caterpillar were greatly reduced by spring mortality in 1964. Only a very small proportion of the area previously heavily defoliated was heavily defoliated in 1964.

On July 12, 1964 a cold front passed through the Whitecourt-Drayton Valley-Westlock area where large numbers of forest tent caterpillar moths had recently emerged. The turbulent air in the rear of the cold front picked up great numbers of these moths and transported them for long distances. Moths of this species were picked up in a wide band to as far south as Lethbridge and Taber indicating that moths had been transported a distance of at least 300 miles.

Insecticides in Alberta from the Viewpoint of Industry - G. Goldberg

This paper outlines the problems of supply which confront the industry. It outlines our safety and educational campaigns and appeals for cooperation in these as well as offering assistance in publicly-sponsored programs. We are concerned with maintaining inventory and service but believe pricing which allows a reasonable profit must be

a part of any realistic program. The paper stresses the importance of the label on agricultural chemicals, and urges wide use of the instructions to stop, read the label and heed its message. An important suggestion is that professional people re-evaluate their programs to discover whether a new approach stressing preventive measures would not be better than the present approach, which tends to encourage losses by waiting until damage occurs before initiating programs. We urge that all concerned re-evaluate their own attitude to eliminate the tendency to emphasize problems and dangers and minimize the undoubted benefits to humanity. It seems a reversal of attitudes is overdue.

Biographies of New Honorary Life Members

George R. Hopping

Mr. George R. Hopping retired from the Department of Forestry in November 1964 after forty years of service with the Government of Canada. He first accepted continuous employment in forest entomology with the Canadian Department of Agriculture in 1925 at Vernon, B.C. and succeeded his father as Officer-in-Charge of the Vernon Forest Insect Laboratory in 1940. In 1947 he was loaned by the Department of Agriculture to the University of British Columbia for one year to establish and teach courses in forest entomology. He subsequently became Officer-in-Charge of the Forest Biology Laboratory of the Department of Agriculture based at Calgary with responsibilities for forest insect and disease investigations. In 1960, after 35 years of service, he requested that he be allowed to return to research activities in bark beetle taxonomy where he established himself as a world authority.

George was born November 14, 1899 in Kaweah, California and received his early education at Berkeley including one year of study at the University of California. He moved with his family in 1920 to Vernon, B.C. where his father, Ralph Hopping became the head of a newly established Forest Insect Laboratory. He subsequently attended Oregon State College (B.Sc.F. 1925) and Iowa State University (M.Sc. 1931).

During his outstanding career Mr. Hopping has published more than 50 technical and semi-technical papers which have been well received both in this country and abroad.

He was an active member of many professional societies and groups including the Entomological Society of Canada. He is a charter member of the Entomological Society of Alberta and served as its president in 1956. On October 30, 1964, Mr. Hopping was made an honorary member of the Society.

- R. F. Shepherd

Richard Harold Painter

At the Twelfth Annual Meeting of the Entomological Society of Alberta Richard Harold Painter, B.S.A., M.Sc. was elected Honorary Life Member of the Society.

Dick Painter was born at Jordan Station, Ontario, on November 18, 1899. He received his early education in the Hamilton area, graduated with B.S.A. from the Ontario Agricultural College at Guelph in 1922, and received the M.Sc. degree from Macdonald College in 1927.

Dick commenced his entomological career in Ontario in 1922, working out of Ottawa for the next ten years on European corn borer, the tarnished plant bug, and mushroom insects. In 1932 he moved west to conduct investigations and surveys, first at Treesbank, Manitoba with Norman Criddle, and later at Brandon and Lethbridge. Shortly after his move to Lethbridge in 1938 he became interested in livestock insects and during the war was in charge of warble fly control for Canada. When the war was over, and because he realized that research was urgently required on pests of livestock, he aggressively urged the establishment of a livestock insect laboratory at Lethbridge. This was finally achieved in 1947 in buildings moved from a nearby airport on land provided by the Lethbridge Experimental Station and Dick became its first officer-in-charge.

Endowed with a personable character and the ability to speak easily and effectively he early displayed ability to address groups on insect control. This first came to the fore when he was part of a group conducting short courses to farmers in rural schools in Saskatchewan in 1937 and 1938. In the work with livestock insects he was soon in contact with livestock associations and was a permanent and popular speaker at their field days and annual meetings. His most recent appointment as Livestock Insect Liaison Officer of the Lethbridge Research Station placed him in a position to interpret research findings to the livestock industry through provincial departments of agriculture, regional fairs, and livestock associations.

Mr. Painter retired from the Canada Department of Agriculture on November 20, 1964 after 42 years service, and his retirement was marked by a testimonial dinner. Of the 220 present over half represented friends and associates outside of the government service. The occasion was marked by numerous messages in the form of telegrams and letters. Recent honours conferred on him include -

Honorary President of the Canadian Hereford Association, election to Agricultural Hall of Fame of the Lethbridge Exhibition Board, Honorary Life Member of the Lethbridge Chamber of Commerce, Tribute of the City of Lethbridge (1963), Honorary Citizen of the City of Brandon (1962), Honorary Director of the Manitoba Winter Fair (1962), Honorary Member of the Brandon Chamber of Commerce (1962), Manitoba Department of Agriculture recognition for service in agriculture (1964), Honorary Life Membership in the Manitoba Stock Growers, Saskatchewan Stock Growers, Alberta Hereford Association and Western Stock Growers Association, Honorary Member of the Regina Riding and Driving Club, and Honorary Member of the Portage La Prairie Riding Club.

In 1925 Dick married Grace Evelyn McCarron of Ottawa, who died in 1956. He has since married Hannah Barlow of Brandon in 1958. Mr. and Mrs. Painter will continue to reside at 422 - 25 Street South in Lethbridge.

- L. A. Jacobson

LEFT PAGE

				W. G. Evans	F. G. Cooch	Leng-Hong Teo	
Y. S. Krishnan	D. Sarai	W. G. Evans & F.J.D. McDonald			Joan Shore		F.J.D. McDonald
D. J. Larson			J. D. Shorthouse		K. Richards		
R. F. Shepherd	G. Burgess		Robert Iverson	Insect Collections	G. R. Hopping	R. H. Painter	
A. J. McGinnis		A.B. Ewen	Miss R. Murdoch	Janet Sharplin	Miss A. Pucat	Geo. Ball	L. Jacobson
A. Nimmo	K. Richards	J. O. Shorthouse	Dining at Kingsway Motel Mrs. G. Burgess		G. Burgess	P. Graham	R. Hartland- Rowe
N. Steward	Joe Shemanchuk	J. Gurba	W. Charnetski	E. T. Gushul	J. D. Shorthouse	H. S. Salama	



TWELFTH ANNUAL MEETING-EDMONTON 1964



ENTOMOLOGICAL SOCIETY OF ALBERTA

RIGHT PAGE

J. Barron	C. E. Brown	A. M. Harper	W. J. Awram	P. J. Procter	R. B. Madge	G. Goldberg
S. McDonald P. E. Blakeley	D. S. Smith A.J. McGinnis	D. R. Whitehead	W. McEwen	J. Edmunds	N. Holmes	M. Reddy
Miss G. Buerger	Mrs. J. Edmunds	Mrs. G. Ball	Mrs. N. Homes	Mrs. W.G. Evans	Miss G. Kiriakides	Miss R. Murdoch
					Mr. & Mrs. G. Ball	
W.G. Evans	J.G. McGregor	J. Edmunds				
Mr. & Mrs. R. E. Leech				N. Belur	N. Steward	Miss G. Buerger
R. Hartland- Rowe	J. Edmunds	J. G. McGregor	R. Leech	Mrs. G. Evans	N. Homes	S. McDonald

ENTOMOLOGICAL SOCIETY OF ALBERTA

Minutes of the Twelfth Annual Meeting

Kingsway Motor Hotel, 10812 Kingsway Avenue, Edmonton, Alberta.
October 30th, 1964.

The meeting was opened by the President, Dr. W. G. Evans, who welcomed the assembled members and guests.

1. Minutes of the eleventh annual meeting - these were taken as read and adopted as published in the 1963 Proceedings on a motion moved by G. E. Ball, seconded by R. Leech. CARRIED

2. The following committees were submitted by the Executive and appointed:

Nominating Committee	B. Hocking (Chairman) L. A. Jacobson E. T. Gushul
Resolutions Committee	P. E. Blakeley G. E. Swailes
Auditors	B. Hocking J. Edmunds
Judges of Insect Collections	G. Burgess (Chairman) R. F. Shepherd D. S. Smith

3. A letter was read from Dr. Eugene Munroe thanking the Society for the gavel presented to the Entomological Society of Canada.
4. A letter from the Director at Large of the Entomological Society of Canada, Dr. L. A. Jacobson, stating that the Canadian Society expected an invitation from Alberta for the 1966 meetings was read. It was felt that Banff might be an ideal location for these meetings.

Dr. Evans indicated that the dates tentatively set for these meetings were September 4, 5, 6, and 7th, 1966.

Some discussion ensued as to the most suitable dates and as to whether the accommodation at the Banff School of Fine Arts was suitable or not. Dr. Hocking thought that the second week in September was the most suitable time. It was then decided to

leave the matter of checking the accommodation and seeing whether the Banff School of Fine Arts was available the second week in September.

5. Insect Collector's Guide.

Report from Miss Joan Shore, Edmonton Director.

The following number of Guides have been sold:

100 to University Bookstore, Edmonton.....	\$20.00
100 to Entomological Society of Ontario....	\$20.00
147 to private people	<u>\$36.75</u>
	\$76.75

The executive at its last meeting felt that the Society should do something about paying back the money outlay by Dr. Hocking and Dr. Ball on this project, or at least pay bank interest on their loan.

Mr. Shemanchuk asked the Treasurer what the financial status of the Society was like.

The Treasurer replied that we had \$340. at hand and would cover the expense of the present meetings with donations received and registration fees.

Mr. Shemanchuk then suggested that perhaps the Society could pay back \$150. and pay interest on the rest of the loan.

Dr. Ball stated that a person he knew concerned with the debt was not interested in getting interest on his money.

Several suggestions were then made as to possible avenues of sale.

Both Calgary and Lethbridge groups reported negligible sales from their stockpile of the Guide.

Dr. Hocking stated that the publication was listed as one of a number of publications to be used in the Biology 32 course in High Schools in Alberta. Some 8,000 students were expected to take this course and therefore there would be little problem in getting rid of the Guide.

Mr. Brown suggested that perhaps a sales committee should be set up to sell these publications.

G. E. Swailes moved and R. C. B. Hartland-Rowe seconded a motion that the Society re-imburse Dr. Ball and Dr. Hocking \$50. each for the Insect Collector's Guide.

B. Hocking moved and G. E. Ball seconded that the previous motion be tabled till the next meeting on Saturday. CARRIED

6. C. E. Brown moved and A. J. McGinnis seconded a motion that we send our annual donation of \$10.00 to the Zoological Records Fund. CARRIED

7. Insect Collection Competition.

It was felt that the deadline for receiving insect collections should be made September 30th at the latest and that the competition committee should consult the executive regarding the dates set.

8. Society Library.

Dr. Evans noted that the Societies library should have been sent to the University of Alberta, Edmonton, for perusal and then to the University of Alberta, Calgary, and finally to the Lethbridge Research Station. He wondered where the library was now, as it had not as far as he knew, reached Edmonton.

Dr. Hartland-Rowe stated that it had not been seen in Calgary.

Dr. Ball suggested that a thorough search be made in the Entomology Department and then inquiries should be made by the secretary as to its whereabouts.

9. Honorary Life Memberships.

The secretary read two letters, one proposing Mr. G. E. Hopping and the other, Mr. R. H. Painter, for life membership in the society.

Dr. Evans pointed out that we had two life members already and that a further two members would not exceed 5% of the membership of the society.

R. F. Shepherd moved and C. E. Brown seconded a motion that Mr. G. R. Hopping be granted Honorary Life Membership in the Society. CARRIED

J. A. Shemanchuk moved and A. M. Harper seconded a motion that Mr. R. H. Painter be granted Honorary Life Membership in the Society. CARRIED

It was suggested that a biography be drawn up and included with this years Proceedings for the new honorary life members.

10. Membership in the Entomological Society of Canada.

The treasurer, Dr. Janet Sharplin, indicated to members that Dr. Becker, Treasurer of the National society, was unhappy with present form of payment of dues. Dr. Sharplin suggested a time limit of say, April 30th, be placed for payment of back dues.

Dr. Steward stated that the society should not worry about payments to Dr. Becker since he had a secretary who dealt with all this business anyway. He felt that the present method of payment in bits and pieces should continue and that members of the society should not worry about this problem. The Ontario society has the same problem and did not concern itself too deeply over it. Dr. Steward also made the point that if a deadline were set, how would this tie up as regards the society's constitution.

Dr. Jacobson pointed out that the Canadian society gave members a years grace anyway for payment of dues.

G. E. Ball moved and Dr. Sharplin seconded a motion that to simplify matters for our treasurer, all money should be held till March and paid in a lump sum to Ottawa. CARRIED

11. Joint Meetings of the Entomological Society of Alberta and Saskatchewan.

The President, Dr. W. G. Evans, apologized for the society's oversight in not inviting the Entomological Society of Saskatchewan earlier to a joint meeting.

G. E. Ball moved and L. A. Jacobson seconded a motion that the secretary invite the Entomological Society of Saskatchewan to a joint meeting in Edmonton in 1967. CARRIED

12. Report on Books purchased for Strickland Memorial Library.

Dr. Hocking reported that two volumes of the Insects Portion of the Zoological Record had been purchased for the library in memory of Mr. A. R. Brooks and Dr. E. H. Strickland, respectively. These had been suitably inscribed and placed in the Strickland Memorial Library.

The meeting closed at 12:00 noon.

ENTOMOLOGICAL SOCIETY OF ALBERTA

Minutes of the Twelfth Annual Meeting (Part 2)

Kingsway Motor Hotel, 10812 Kingsway Avenue, Edmonton, Alberta.
October 31st, 1964

The meeting was opened by Dr. R. C. B. Hartland-Rowe, the Vice President, in the absence of the President, Dr. W. G. Evans, who was unable to attend due to illness.

1. Insect Collection Committee.

G. Burgess presented the following list of winners on behalf of the committee:

Senior Event - First.....Robert Iverson (Edmonton)

Junior Event - First.....Beverly Ann Lambert (Edmonton)

No other prizes were awarded.

2. Report of the Standing Committee to supervise the Insect Collection Competition.

Mr. C. E. Lilly, Chairman of this Committee, reported a very disappointing year for the Insect Collection Competition. In his report he called for a discussion from the floor concerning the advisability of carrying on this competition and suggestions for increasing the response.

3. Report of the Nominations Committee.

Dr. B. Hocking, Chairman of the Nominating Committee, presented the following slate of officers for the coming year:

President	R. C. B. Hartland-Rowe
Vice President	R. W. Salt
Secretary	G. Burgess
Treasurer	R. E. Stevenson
Editor	H. F. Cerezke
Directors	J. Shorthouse (Lethbridge)
	J. L. Carr (Calgary)
	R. Freitag (Edmonton)
Director to the Canadian Society	- C. E. Brown

N. Holmes moved and A. J. McGuiness seconded that nominations cease. CARRIED

B. Hocking moved and M. J. Reddy seconded that nominees be appointed subject to their acceptance. CARRIED

4. The following report of the Resolutions Committee was read by P. E. Blakeley, who moved its adoption. The adoption was seconded by N. Holmes.

Whereas the Twelfth Annual Meeting of the Entomological Society of Alberta has been informative, refreshing and thoroughly enjoyed.

BE IT RESOLVED THAT letters of appreciation be sent to:

- (a) Dr. A. G. Couch for his provocative invitational paper on a wild-life biologist's views on the use of insecticides.
- (b) Mr. A. J. McGregor for his informative address on the history of the Canadian Prairies as recorded in the journal of Peter Fiddler.
- (c) The following companies that have given financial assistance for these meetings:

Allied Chemical Services, Calgary
Chemagro Limited, Toronto, Ontario
Chipman Chemicals Limited, Edmonton
Cyanamid of Canada Limited, Edmonton
Dow Chemical of Canada, Calgary
Fison's (Canada) Limited, Calgary
Green Cross Products, Edmonton
Later's of Canada Limited, Edmonton
Niagara Brand Chemicals, Edmonton
Northwest Pest Control, Edmonton
Oliver Chemicals Limited, Lethbridge
Shell Oil Company of Canada, Chemical Division, Calgary
Union Carbide Canada Limited, Winnipeg

AND FURTHER BE IT RESOLVED THAT our thanks be extended to:

- (a) Dr. and Mrs. G. E. Ball for their unstinting hospitality.
 - (b) The various committees whose efforts have made these meetings so successful. CARRIED
5. The treasurer's interim financial report was presented.

6. Directors Three Year Term.

The secretary apologised for the fact that the motion passed at the last Annual Meeting was overlooked and that when he had realised this, it was then too late to send out notices of motion to change the constitution.

The society decided that the previous motion should stand and that notices of motion be sent to members as soon as possible.

7. Committee for Entomological Society of Canada Meetings, 1966.

Dr. Shepherd suggested that a steering committee be set up to make some plans for the 1966 meetings.

Dr. Jacobson thought that this was a good idea and that contacts should be made early for financial support for the meetings. Further, a theme should be established.

L. A. Jacobson moved and R. F. Shepherd seconded a motion that the executive set up a steering committee for the 1966 meetings of the Canadian Society. CARRIED

8. Scholarship Fund.

Dr. Hocking pointed out to the society that Cyanamid of Canada would withdraw its scholarship as from 1st April, 1966.

Dr. Ball said he felt that insecticide companies should not be approached for further grants as generally they put restrictions on them.

Some discussion followed on the Canadian societies committee on scholarships.

J. B. Gurba moved and W. A. Charnetski seconded a motion that the society was sympathetic to any moves the Canadian society might make on scholarship funds but that at the moment we take no action. CARRIED

Dr. G. E. Ball moved and P. E. Blakeley seconded a motion that the society thank Cyanamid of Canada for the scholarship. CARRIED

9. Motion tabled at the Meeting on Friday, October 30th.

G. E. Ball moved and B. Hocking seconded a motion that the motion be tabled until the Entomological Society of Alberta meetings in 1975. DEFEATED

The proposer and seconder of the original motion under paragraph five then withdrew their motion.

10. Report from the Director to the National Society (L. A. Jacobson).

- a) Dr. M. R. Mackay to be the new editor--her acceptance was contingent on providing continuing secretarial assistance, which was approved by the directors and the annual meeting at a cost of \$6,000 per year.
- b) Commencing January 1, 1966, the journal will charge \$15.00 per page. This was found necessary as the publication has raised prices from \$10.50 to \$13.00 per page in 1955 and to \$16.00 in 1956. (This can be compared with: ESA journals - \$20.00, AIC journals - \$36.00.) The adoption of page charges was made in place of raising annual dues.
- c) The Centennial of Entomology Committee (1963) reported a surplus of approximately \$977. The annual meeting on recommendation of the Committee approved that the surplus would be returned to the regional societies pro rata according to their original donations. The Entomological Society of Alberta will receive \$21.47 ($4\frac{1}{2}$ per cent of \$150.00).
- d) Sites of future meetings were approved with the following tentative dates:-

1965 - University of N.B. - Acadian Society - Aug. 31-Sept. 2.

1966 - Banff School of Fine Arts - Ent. Soc. Alta. - Sept. 5-7.

S. McDonald moved and N. Holmes seconded a motion that the Director's report be accepted. CARRIED

Dr. Ball wished it to be on record that he objected most strenuously to the page charges in the Canadian Entomologist and that he was sorry to see this happen.

L. A. Jacobson moved a formal vote of thanks to the outgoing executive. Seconded by N. Holmes. CARRIED WITH ACCLAMATION

Meeting closed at 12:05 P.M.

Signed: F.G.D. McDonald
Hon. Secretary

Treasurer's Report

Paid up membership for the year 1964 for the Alberta Entomological Society was 56, of whom 16 were students. Canadian Entomological Society membership was 38.

Generous donations from the industrial concerns listed in the minutes more than covered our losses on the annual meeting; we had \$76.52 in hand after the meetings. The membership dues collected were insufficient to cover the expenses incurred during the rest of the year and the profit from donations was reduced to \$23.08.

FINAL STATEMENT OF FINANCES YEAR ENDING DECEMBER 22, 1964

Receipts

Bank Balance Jan. 23, 1964 (transferred from Lethbridge)		346.15
Membership Fees		
Ent. Soc. Canada, 1964	150.00	
Ent. Soc. Alberta, 1964	82.00	
Ent. Soc. Canada, 1965	128.00	
Ent. Soc. Alberta, 1965	28.00	
	<u>388.00</u>	388.00
Donations		175.00
Registrations and Banquet		281.30
Refund from Centennial		<u>21.47</u>
		1211.92

Disbursements

Can. Ent. Fees	280.00
1963 Proceeding Expenses	34.41
Centennial Gavel	11.24
Prizes	79.84
Expenses for Annual Meetings	379.78
Contribution to Zoo Record	10.25

continued over.....

Disbursements continued...

Contribution to Zoo Record	10.25
Memorials and Sympathy	45.42
Bank Charges	<u>1.75</u>
	<u>842.69</u>
Balance	<u>369.23</u>
	1211.92

Audited January 25, 1965.

J. Sharplin, Treasurer

B. Hocking

J. W. Edmunds

MAILING LIST, 1964-65

Members

Abdulnur, Mr. O.	Department of Entomology, University of Alberta, Edmonton.
Adiosomarto, Mr. Tony	Department of Entomology, University of Alberta, Edmonton.
Awram, Mr. J.	Department of Entomology, University of Alberta, Edmonton.
Ball, Dr. G. E.	Department of Entomology, University of Alberta, Edmonton.
Ball, Mrs. K.	Department of Entomology, University of Alberta, Edmonton.
Belur, Mr. N. V.	Department of Entomology, University of Alberta, Edmonton.
Berg, Dr. C. O.	Department of Entomology, Cornell University, Ithaca.
Berg, Mr. C. V.	553 Breckenridge Street, Helena, Montana
Blakeley, Mr. P. E.	Research Station, Canada Agriculture, Lethbridge.
Broadfoot, Dr. W. C.	Research Station, Canada Agriculture, Lethbridge.
Brown, Mr. C. E.	Forest Ent. & Path. Lab. 102 - 11th Ave. S. E., Calgary.
Carr, Mr. J. L.	R. R. #4, Calgary
Cerezke, H. F.	Forest Ent. & Path. Lab., 102 - 11th Ave. S. E., Calgary
Chan, Mr. K.	2523 - 17th Avenue S.W., Calgary.
Depner, Mr. K. R.	Research Station, Canada Agriculture, Lethbridge.
Elliott, Mr. D. P.	Forest Ent. & Path. Lab., 102 - 11th Avenue S. E., Calgary.
Evans, Dr. W. G.	Department of Entomology University of Alberta, Edmonton.

Gurba, Mr. J. B.	Department of Crop Protection and Pest Control, Field Crops Branch, Alberta Department of Agriculture, Edmonton.
Gushul, Mr. E. T.	Research Station, Canada Agriculture, Lethbridge
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.
Hilton, Mr. D. F. J.	3048 First Street S.W., Calgary.
Hobbs, Dr. G. A.	Research Station, Canada Agriculture, Lethbridge.
Hocking, Dr. B.	Department of Entomology University of Alberta, Edmonton.
Holmes, Dr. N. D.	Research Station, Canada Agriculture, Lethbridge.
Hopkins, Mrs. M. E. P.	3 Canyon Drive, Calgary.
Jacobson, Mr. L. A.	Research Station, Canada Agriculture, Lethbridge.
Johnson, Mr. P. C.	Division of Forest Insect Research, Federal Building, Missoula, Montana.
Kloppenborg, Mr. N. E.	Research Station, Canada Agriculture, Lethbridge.
Kush, Mr. D. K.	Forest Ent. & Path. Lab., 102 - 11th Avenue S.E., Calgary.
Larson, Dr. Ruby I.	Research Station, Canada Agriculture, Lethbridge.
Lilly, Mr. C. E.	Research Station, Canada Agriculture, Lethbridge.
Lee, Mr. F. C.	633 Gore Avenue, Vancouver 4.
Leech, Mr. R. E.	Department of Entomology University of Alberta, Edmonton.

Lindsay, Mr. I. S.	Environmental Protection, Defence Research Board Headquarters, Ottawa.
McDonald, Mr. S.	Research Station, Canada Agriculture, Lethbridge.
McGinnis, Dr. A. J.	Research Station, Canada Agriculture, Lethbridge.
Murdoch, Miss Rita	Department of Entomology, University of Alberta, Edmonton
Nelson, Dr. W. A.	Research Station, Canada Agriculture, Lethbridge.
Newgard, Mr. B.	2501 Olive St., Apt. 1, Long Beach 6, California.
Nummi, Mr. W. O.	Research Station, Canada Agriculture, Lethbridge.
Pankiw, Mr. P.	Experimental Farm, Beaverlodge.
Peterson, Mr. L. K.	Research Station, Canada Agriculture, Lethbridge.
Procter, Mr. P. J.	Department of Crop Protection and Pest Control, Field Crops Branch, Alberta Department of Agriculture, Edmonton.
Pucat, Miss A. M.	Department of Biology, University of Saskatchewan, Regina.
Reddy, Mr. M. J.	Department of Entomology, University of Alberta, Edmonton.
Reid, Dr. R. W.	Forest Ent. & Path. Lab., 102 - 11th Avenue S. E., Calgary
Robertson, Mr. R. H.	Research Station, Canada Agriculture, Lethbridge.
Salt, Dr. R. W.	Research Station, Canada Agriculture, Lethbridge.
Sharplin, Dr. Janet	Department of Entomology, University of Alberta, Edmonton.
Shemanchuk, Mr. J. A.	Research Station, Canada Agriculture, Lethbridge.
Shepherd, Dr. R. F.	Forest Ent. & Path. Lab., 102 - 11th Avenue S. E., Calgary.

Shore, Miss Joan C.	Department of Entomology University of Alberta, Edmonton
Smith, Dr. D. S.	Research Station, Canada Agriculture, Lethbridge.
Stevenson, Mr. R. E.	Forest Ent. & Path. Lab., 102 - 11th Avenue S. E., Calgary
Story, Mr. T. P.	Research Station, Canada Agriculture, Lethbridge.
Swailes, Dr. G. E.	Research Station, Canada Agriculture, Lethbridge.
Swindlehurst, Mr. E. B. S.	13812 - 110A Avenue, Edmonton.
Tawfic, Mr. M. S.	Department of Entomology, University of Alberta, Edmonton.
Van Veen, Mr. N. W.	932 - 5th Avenue N. E., Calgary
von Gernet, Gertrude	Department of Entomology, University of Alberta, Edmonton,
Virostek, Mr. J. F.	Research Station, Canada Agriculture, Lethbridge.
Weintraub, Mr. J.	Research Station, Canada Agriculture, Lethbridge.
Whitehead, Mr. D.	Department of Entomology, University of Alberta, Edmonton.

Honorary Life Members

Hopping, Mr. G. R.	Forest Ent. & Path. Lab., 102 - 11th Avenue S. E., Calgary.
Painter, Mr. R. H.	Livestock Insect Liaison Officer, c/o Research Station, Canada Agriculture, Lethbridge.
Seamans, H. L.	581 Fraser Avenue, McKellar Park, Ottawa.
White, R. M.	R. R. #1, West Summerland, British Columbia