

PROCEEDINGS OF THE SIXTH ANNUAL MEETING
OF THE
ENTOMOLOGICAL SOCIETY
OF
ALBERTA



EDMONTON - ALBERTA
OCTOBER 17TH - 18TH, 1958

Proceedings of the
ENTOMOLOGICAL SOCIETY OF ALBERTA

Vol. 6

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December, 1958

SIXTH ANNUAL MEETING

October 17th and 18th, 1958, Airlines Hotel, Edmonton.

The Airlines Hotel in Edmonton provided an ideal location for the Sixth Annual Meeting. Members renewed acquaintances and discussed the past summer's projects on Thursday evening at the Presidential Suite and at the home of Dr. and Mrs. B. Hocking.

An executive meeting was held Friday morning while the members were registered. The meetings were started with a Presidential Address, followed by papers throughout the rest of the day. Prominent in those presenting papers were staff and graduate students from the expanding Department of Entomology at the University. Saturday morning saw more papers being given and the business meeting. On Saturday afternoon visitors to Edmonton were invited to visit the new quarters of the Department of Entomology at the University.

The highlight of the meetings was the banquet Friday night. Cocktails and roast beef were used to brighten up the members. This prepared the way for an excellent address by the guest speaker Prof. T.G. Rempel of the University of Saskatchewan who spoke on "Teaching Trends in Canadian Entomology."

This was quite a thought-provoking paper obviously prepared after a great deal of work on the subject.

Mr. John Forrest, a young Scotch lad, entertained the members with accordian and song on everything from Irish ballads to rock and roll. His tartan dress and heavy brogue pleased everyone and he had little trouble in rousing a good sing-song.

Mr. Evan Gushul showed some excellent "stills" of Alberta scenery and Dr. G.A. Hobbs demonstrated with movies the wild life found in S.E. Alberta.

Presidential Address

Snodgrass has written: "Arthropods are a group of related INvertebrates; arthropodists are a group of UNrelated vertebrates". The lack of contact between the various branches of this organization for the past year certainly bears out the second part of the quotation.

However, the relative inactivity of the Society this past year as compared to its tremendous productivity in former years does not reflect inactivity of individual members or groups of members. Rather, I suspect the reverse is true: that individual activity dominated the scene to the exclusion of society activity. Thus each geographical unit has attended to work of its own, and each group has developed new sets of facts and perhaps new ideas.

If I may be allowed to draw an analogy, this is the way in which natural populations of species function, that is, in semi-isolation from each other, each developing its own adaptive gene recombinations, incorporating new and favorable mutations, rejecting unfavorable mutations and recombinations. Then, the species as whole embarks on a course of progressive evolution when mixtures of formerly isolated populations take place, and favorable genetic combinations are spread throughout the species.

To complete the analogy, if we compare the Entomological Society of Alberta to a species composed of semi-isolated populations, the annual meeting becomes the time of intermingling of populations. The new facts and new ideas which are brought to the meeting are the analogues of the mutations and recombinations in the hypothetical species. Perhaps as a result of the ideological panmixia about to be achieved, the Society, like the successful species, will continue its progressive evolution.

Abstracts of Papers

Demonstration of Hexokinase and
Related Enzymes in Larvae of the
Wheat Stem Sawfly, Cephus cinctus Nort.

A.J. McGinnis & R. Kasting

Nutritional studies on the wheat stem sawfly have suggested that hexokinase, the enzyme that catalyses the formation of glucose-6-phosphate from glucose and adenosine triphosphate, may be absent in newly hatched larvae. The soluble portions of homogenates or acetone powders of half grown and mature larvae were used as the enzyme source. A sugar phosphate was shown by paper chromatography to be produced in the enzyme digests. However, it was conclusively demonstrated, in a study with uniformly labelled C¹⁴-glucose, that this product was not glucose-6-phosphate. The identity of the product is as yet unknown. Further work has indicated that all the enzymes involved in the conversion of glucose to the triose phosphates via the glycolytic pathway are present. This is indirect evidence for the presence of hexokinase in the larvae and it remains now to show whether hexokinase is present in the newly hatched form.

Body Temperatures of Insects in Flight

N.S. Church

In fairly large, strong-flying insects long-wave radiation and evaporation of water play only a small part in cooling the body in flight. Little heat is transmitted from the thorax to the head and abdomen and the appendages, despite the circulation of the blood, and these parts stay near air temperature. About 70% of the heat produced by the flight muscles is removed directly from the thorax by convection; the temperature excess of the thorax depends mainly on the factors that govern convection. The dense coats of hair on bumble bees and many moths hinder convection and increase the

temperature excess of the thorax by 50 to 100% or more. In a large hawk moth this probably means an increase of at least 8 or 9° C.--from perhaps 8° without hair to 17° with the hair intact. In dragonflies the subcutaneous air sacs produce much the same result.

Factors Controlling the Internal Temperatures of Spruce

Budworm Larvae, Choristoneura fumiferana (Clem.)

Roy F. Shepherd

Laboratory studies showed a direct relationship between the radiation intensity striking a larva and the excess of larval temperature over air temperature. These excesses were reduced as the square root of wind speed above 60-80 ft./min. Below this speed, changes in wind speed had a greater effect on the reduction of excesses. Evaporation tended to reduce larval temperatures to wet bulb temperatures when water was placed on the cuticle of the larvae. Measurements made during days of bright sunshine indicated that larvae on overstoried spruce reproduction had an average temperature excess of 2.3°C. and larvae on reproduction in a stand opening had an average excess of 3.7°C.

Notes on the Woolly Bear, Apantesis sp.

L.A. Jacobson and K. Robertson

Larvae of the woolly bear, Apantesis sp., are often reported during the early spring, infesting pastures in southern Alberta. In April, 1958, an infestation was investigated in a large community pasture north of the South Saskatchewan river at Bow Island. A population of about 1.6 larvae per square foot over several hundred acres kept the grass cropped until mid-May.

Results of rearing all stages in the laboratory were described. The larvae were fed successfully on leaves of dandelion. Durations of the egg,

larval, prepupal, and pupal stages were 7, 40-60, 2-3, and 10-14 days, respectively. Moths were fed on a honey-water solution and laid conical-shaped eggs after about 4 days. Longevity averaged about 20 days.

Problems in Mosquito Dispersion

W. Klassen

Among conditions necessary for a directed movement of insects are sufficient energy reserves, sufficient locomotory drive and the presence of orientating factors in the environment. Orientation by wind was discussed in relation to the optomotor theory of Kennedy (1940) and Kalmus (1948).

Some possible ways in which the topography may exert an influence on the movement of insects was dealt with.

Problems in the passive transport of insects by wind was considered. The lack of detailed knowledge of adult behaviour prevents the formulation of a satisfactory theory in the dispersion period.

A Method for Obtaining Larvae of Sexton Beetles (Necrophorus spp.; Coleoptera, Silphidae)

R.B. Madge

A review of the life history of Necrophorus spp. was given. Two methods used by previous workers to obtain larvae were described and their disadvantages brought out. A new method combining features of these two was described along with the results obtained with its use. A suggestion for overcoming a moisture difficulty was put forth.

The Biology and Systematics of Some Interesting Neuroptera (Nemopteridae) from Egypt.

A.A. El-Moursy

This study deals with five species of Egyptian Nemopteridae namely: Pterocroce arenaria Roux, Nina withycombei Navas, N. alfierina Navas, N. chobauti MacLachlan and Klugina aristata Klug. The life cycles of all the species excepting that of Nina chobauti were completed in the laboratory and the different instars were described. The larvae are characterised by their very long necks. They live in the caves, tombs, neglected mines and other deserted human dwellings. They feed on small sluggish soft insects and animals inside the cave. Under the most favourable conditions of temperature and abundant food supply the larva takes at least one year to transform into adult. When food is scarce the larval longevity may extend to seven years. The larva pupates in a spherical cocoon made of fine sand particles and silk secreted by the malpighian tubules.

Adult nemopterids are beautiful delicate insects with ribbon-shaped hind wings and long beaks. The morphology of the adults of the five species was studied and a key for the identification of the males and females was proposed.

The Influence of Light Intensity on the Nocturnal

Emergence of the European Chafer

W.G. Evans and G.G. Gyrisco

By measuring the light intensity at the time of emergence of the European chafer during the evening and by conducting experiments with this beetle in a cage in which the light intensity could be altered, it was found that emergence, though not necessarily flight, took place at light intensities

of less than 32 foot candles. Some unknown factor or set of factors is involved in the migration of the adults to the surface of the soil and in causing the chafer to fly, since lowered light intensities can bring about emergence, but not flight, during the day. Light intensity therefore, probably acts as a triggering mechanism for maintaining the periodical activity of the European chafer.

Preliminary Report on the Study of Dormancy in Certain Economically Important
Miridae (Hemiptera)

A.B. Ewan

Diapause in an egg, larva or pupa, is seen as an arrest of development, and in the imago, as an arrest of reproductive activity, especially in the ovaries. Investigation as to the nature and cause of the arrest in Miridae was begun on Liocoris unctuosus. In North-Eastern Saskatchewan, eggs are laid in the spring. There are five nymphal instars, the nymphal period lasting six to eight weeks. The adults emerge around the end of June, and these same adults overwinter.

Adults were collected in the field in July and maintained under developmental conditions in the laboratory (70°F., 70% relative humidity), until the following February. There was no evidence of egg development, or that these insects had copulated, when they were examined by dissection. Insects exposed for at least $2\frac{1}{2}$ months to a 40°F. temperature, followed by a return to laboratory conditions for about two weeks prior to dissection, show a definite egg development, with from 12 - 22 eggs in the ovaries. Much of the above work was initiated by Mr. J.C. Arrand, at the Canada, Agriculture Research Laboratory, Saskatoon, Sask.

The rate of oxygen consumption was recorded for the period July, 1957, to February, 1958, using a simple differential respirometer, and a full account is given of the details of construction and operation. A significant reduction in the rate of oxygen consumption in time, would provide good corroborative evidence of a true imaginal diapause. The results, however, showed the rate to be unchanged for the duration of the experiment, remaining at the level of about 1.1 microlitres O_2 /mgm. body weight/hour. Moreover, on insects transferred from cold (40°F. and below) to warm conditions, the rate was found to rise immediately (within one hour) to the level characteristic of those insects maintained in the laboratory. The rate of oxygen consumption was affected in the usual way by varying the temperature, increasing with increasing temperature, and decreasing under colder conditions. Similar results were obtained in the field under comparable conditions.

Future work will be directed toward investigation of the effect of varying the photoperiod, temperature, and temperature and photoperiod together, on the arrest of reproductive development in Liocoris unctuosus. The same methods will be used on Adelphocoris lineolatus and A. rapidus, both of which overwinter in the egg stage in North-Eastern Saskatchewan. The influence of these environmental factors on the endocrine control of dormancy and/or the reproductive cycle is the long-term project. Morphological and histological detail of the neurosecretory system of Liocoris unctuosus and Adelphocoris lineolatus is now being investigated.

Population Dynamics of the Lodgepole Needle Miner, Recurvaria starki Free.

R.W. Stark

The lodgepole needle miner, Recurvaria starki Free. has been studied intensively since 1948. Until 1953, this insect was referred to in publications as Recurvaria milleri Busck. The life history and taxonomic position of R. starki were reviewed briefly and an historical review of the research carried on since 1948 was given.

A full description was given of the procedure of applying life table techniques to needle miner studies since 1954 and examples were given for selected study areas. Six sampling intervals, one egg, four larval and one pupal are deemed suitable to assess the course of the population of a single generation from the time of oviposition to moth emergence.

The life tables and survivorship and death-rate curves show clearly that there were five periods in the two-year life cycle of the lodgepole needle miner during which extensive mortality may occur: (1) between egg formation and oviposition; (2) between oviposition and larval establishment; (3) during the first larval hibernation; (4) during the second larval hibernation; (5) during the spring of moth emergence. Population success is also undoubtedly affected by conditions during the adult life.

Population sampling has shown that the outbreak has declined since 1948. Defoliation and increment studies have shown that the period of greatest defoliation occurred from 1940 to 1944 and that the outbreak probably began in the late 1930's. The major cause of the decline was winter temperatures, probably during the coldest month. From laboratory experiments and population sampling compared with weather records it is estimated that

needle miner populations can have a high survival if extreme minima of -30°F to -40°F do not persist long enough to depress the mean monthly temperature to near 0°F .

Parasitism was not a particularly important factor in the outbreak decline probably because of a greater depressant effect on parasite populations by winter temperatures. Other natural control factors are discussed as well as the possible effects of climatic factors on oviposition and fecundity.

From a detailed survey of weather records since 1920 and yearly averages since 1885 it is postulated that release of the needle miner population was due to a warming trend in the climate of the region. This began in the late 1930's, reached a peak in the mid-1940's and has declined since that time. The warming trend has been noted by other authors for northern latitudes and is substantiated by the weather records of this region. It is further postulated that the climate of this part of western Canada is generally too severe for an outbreak of the lodgepole needle miner, Recurvaria starki Free. to be prolonged.

Role of Trypanosoma melophagium in Population Cycles of the Sheep Ked,

Melophagus ovinus (L.)

W.A. Nelson

In 1956 I published a note (Nature 178:750) stating that T. melophagium caused mortality in sheep keds. Large numbers of the crithidial stage of this flagellate were found to block the posterior midgut of keds, apparently causing their death. In 1958 an experiment was set up to discover whether this parasite actually caused the mortality which produced annual declines in ked populations.

In November, 1957, twelve ewes were made trypanosome-free and were infested with sheep ked puparia which had been treated with 0.01% HgCl_2 . On March 18, April 3 and April 17, six of the ewes were infected per os with a suspension of infective forms of Tr. melophagium. Confirmation of the infection was done by xenodiagnosis.

On both the infected and the trypanosome-free ewes, ked numbers declined in much the same manner, although there was some indication that the infection may have hastened the mortality. It was concluded that the flagellate was not the sole cause of annual declines in ked numbers.

Investigations on a Fungous Disease of Grasshoppers

R.B. Baird

Investigations on Empusa grylli Fres. were initiated in southern Alberta during the summer of 1957. The fungus, which causes disease in the nymphal and adult stages of grasshoppers and locusts, was first described in 1956 by Fresenius. Its occurrence in a population is easily recognized as diseased grasshoppers, a short time before death, attach themselves at or near the top of a plant or other object where they remain until knocked off by wind or rain. It is a difficult disease to study as all attempts at laboratory culture and transmission have been unsuccessful, and its occurrence in the field is sporadic. Melanoplus bivittatus (Say) is the species most commonly infected in southern Alberta, but it is found in populations of Camnula pellucida (Scudd), M. packardii Scudd, and M. bilituratus (Walker). Considerable variation has been observed in the action of the fungus in the different species of grasshoppers. The reasons for these variations are not known. However, it is anticipated that the present study will explain these differences as well as to determine the value of the fungus as a biological control agent.

A Review of Insect Cuticle Penetration

F. Matsumura

The mechanism of the insects' cuticular penetration was reviewed with regard to the cuticle hardening, the structure of the epicuticle and the nature of the wax, especially that of the melting point.

The striking work of Holdgate (1955, 1956) was introduced; it has been shown that there was not a critical temperature which has been assumed to be due to the melting point of the insect cuticular wax, and that there was no structural change in epicuticle during the heating process which may have caused an increase in water permeability.

INSECTS ON THE TELEPHONE

Joan C. Shore

A number of incidents dealing with the identification of insects troubling the general public was described. The faulty packaging of insect specimens to be sent through the mail was mentioned. The variety of telephone calls received in the department of entomology was mentioned as they include calls on rats, mice, pocket gophers, crows, and bats.

In summary, a call received just the day before was described. The lady calling asked if the Entomological Society of Alberta, which she had heard was meeting in Edmonton, could discuss the problem she was having with the larvae of moths in her grass and if they could, would we please let her know the results of the discussion.

Studies on the Embryonic Cuticle in Insects: Tridactylus variegatus (Orthoptera),
Tenebrioides mauritanicus (Coleoptera).

M. Shamsuddin

The production of a provisional cuticle is the result of a moult initiated to bring the rate of deposition of cuticle in relation to the development of muscle-ends. It is, in fact, a process which synchronizes cuticle deposition with the development of muscle ends.

It was clear from the examination of serial sections that the moult of the provisional cuticle during embryogenesis of T. variegatus was accompanied by significant changes in different glands of internal secretion.

Histological evidence showed that the provisional cuticles of Tridactylus variegatus and Tenebrioides mauritanicus were composed of two primary layers, the epicuticula and the endocuticula. In both insects the epicuticula is composed of four distinct layers.

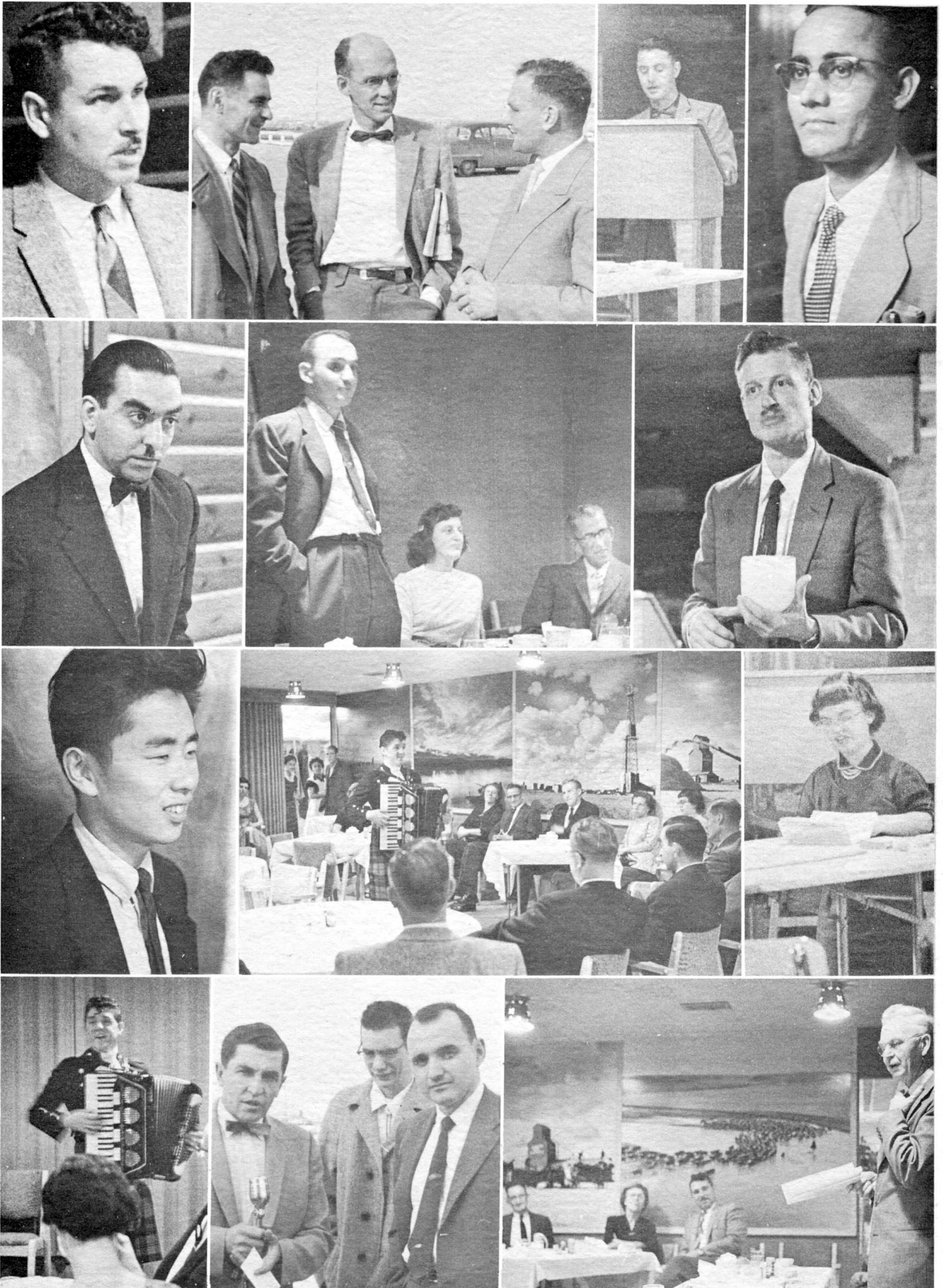
FLUON - and flew off again.

B. Hocking

The applications of polytetrafluorethylene films in entomology were described. These result from their peculiarly low coefficient of friction, and include practical applications such as barriers across which insects are unable to walk, and laboratory applications facilitating rearing and handling of insects and contributing to an understanding of mechanisms of tarsal contact.

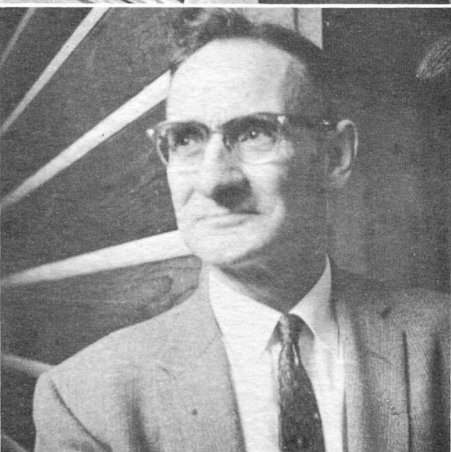
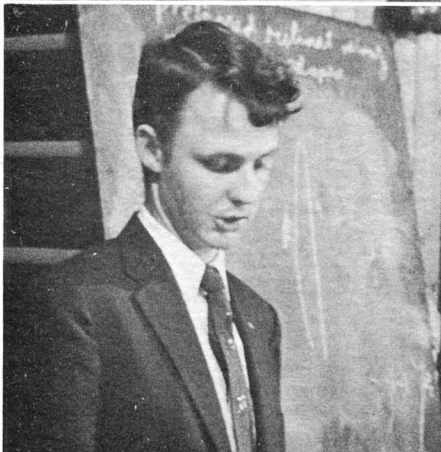
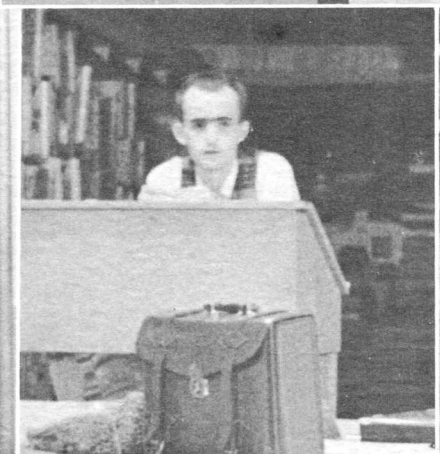
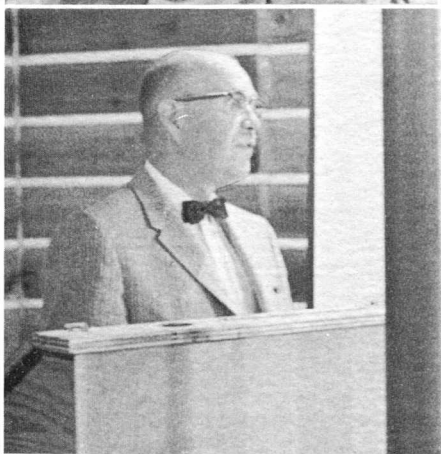
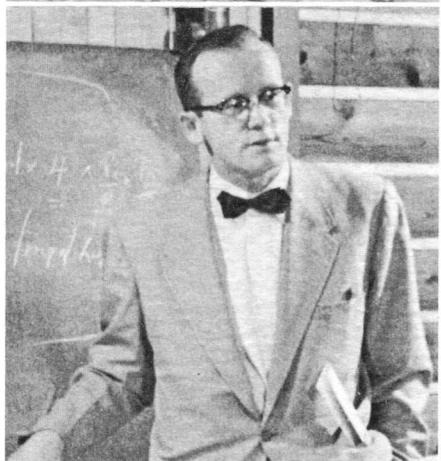
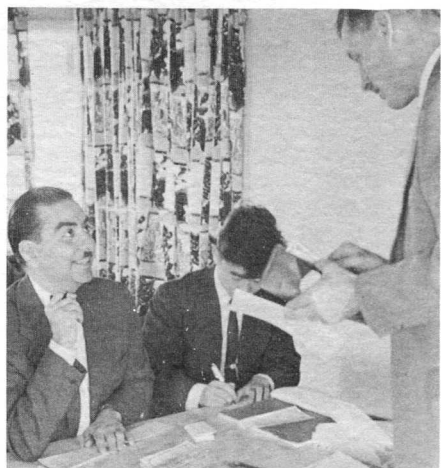
References:

- BUNN, C.W., COBBOLD, A.J. and PALMER, R.P., 1958, The Fine Structure of Polytetrafluoroethylene. Journal of Polymer Science. 28(117):365-376
- MERTON, Sir Thomas, 1956, On a barrier against insect pests. Proc. R. Soc. Lond. A. 234: 218-220.



EIMONTON, ALBERTA

OCTOBER 17 AND 18, 1958



SIXTH ANNUAL MEETING OF ALBERTA ENTOMOLOGICAL SOCIETY

SIXTH ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ALBERTA

AIRLINES HOTEL - EDMONTON, October 18th, 1958.

The meeting convened at 11:30 A.M. with 32 members present. The president Dr. G.E. Ball, welcomed the members.

The minutes of the last general meeting were read and adopted on motion by Secretary, J.B. Gurba, seconded by B. Hocking. CARRIED.

The treasurer's interim financial statement was presented by G.E. Ball in the absence of J.H. Brown, who was in bed with the 'flu. Adoption moved by G.E. Ball, seconded by D.S. Smith. CARRIED.

R.F. Shepherd presented the report of the Editor-Librarian. He summarized the activity of the Library Committee and their recommendation that the Library be permanently placed at the Calgary Forest Biology Laboratory.

It was moved by R.F. Shepherd that the By-Laws be changed to empower the Editor-Librarian to appoint a Custodian for the Society Library. Seconded by R.W. Stark. CARRIED.

Considerable discussion took place on the best way to provide reference material for amateurs and the general public.

At this time the following resolution was moved by S. McDonald, Chairman of the Resolutions Committee on behalf of J.H. Brown, seconded by G.E. Ball:-

WHEREAS, the mover of this resolution was empowered by the Executive on October 17, 1958, to interview the Librarian of the Edmonton Public Library as to the purchasing of "basic" reference books on entomology for the use of the general public, and

WHEREAS, during the interview the Reference Librarian expressed eager interest in the proposal and said that such books would be purchased by the Library Board and made available to the public providing that:-

1. They were basic books and not highly technical or specialized works.
2. The Alberta Entomological Society appoint an Advisory Committee to assist the Reference Librarian in selecting the necessary books.

WHEREAS, the Reference Librarian expressed the opinion that the Librarians at Calgary and Lethbridge would probably be interested in the same proposal, and

WHEREAS, the Reference Librarian would like to acquire for the "Pamphlet File" as many re-prints as possible on Alberta insects - such re-prints to be donations to the library and available to students and the general public as reference material.

BE IT RESOLVED:-

- (1) That this Society appoint an Advisory Committee to select and recommend to the Librarians of the Edmonton, Calgary and Lethbridge Public Libraries a list of basic books on Entomology, and
- (2) That when the books have been acquired the Department of Education be asked to notify all school students that the books are available in the Public Libraries, and
- (3) That all members of the Alberta Entomology Society be requested to forward copies or re-prints of their publications concerned with Alberta insects to the Reference Librarian, Edmonton Public Library.

The following amendment was moved by R.W. Stark, seconded by B. Hocking - "That Alberta schools be approached by the Advisory Library Committee to purchase recommended books." AMENDMENT CARRIED.

Resolution as amended - CARRIED.

It was agreed that the Advisory Library Committee should be appointed by the Executive and proposed members notified by mail.

Considerable discussion resulted from motion by R.F. Shepherd "that the Advisory Library Committee be empowered to spend up to \$50.00 for the purchase of reference books for the Society Library" and a subsequent motion by P. Blakeley seconded by S. McDonald "that motion by Shepherd be tabled."

Both motions - DEFEATED.

It was moved by D.S. Smith, seconded by J.A. Shemanchuk, "That the Advisory Library Committee be instructed to consider the purchase of reference books and report their findings to the next general meeting." CARRIED.

Regional representatives, P. Blakeley, Lethbridge and B. Hocking, Edmonton, reported on the insect collection competition. It was agreed that judging for the 1958 competition should be done by the Entomology Department, University of Alberta. Any proposed changes in competition rules should be submitted to the Chairman of the Committee and the spending of extra funds should be referred to the next general meeting.

Dr. B. Hocking reported that Natalka Horeczko won the \$50.00 prize and that the North American Cyanamid Scholarship for the 1958-59 term was awarded to F. Matsumura of Japan.

The Honorary Life Membership scroll for H.L. Seamans was prepared by J.H. Brown with a supply of blank scrolls available for future use. The secretary was instructed to mail out Mr. Seamans' scroll and have one prepared and mailed to Professor E.H. Strickland since such had not been awarded previously.

At this time, S. McDonald, Chairman of the Resolutions Committee, introduced the following resolution, regarding recommending H.L. Seamans for an Honorary Doctor of Laws Degree, moved by J.H. Brown, seconded by L.A. Jacobson:

WHEREAS, Howard L. Seamans, while Head of the Dominion Entomological Laboratory, Department of Agriculture, at Lethbridge, made valuable and lasting contributions in the field of applied entomology as related to the control and destruction of agricultural insect pests, and

WHEREAS, such contributions were of great economic worth to Alberta farmers, and

WHEREAS, his pioneer work did much to establish applied agricultural entomology as an integral part of modern scientific farming, and

WHEREAS, the Senate of the University of Alberta is the sole body empowered to receive recommendations for, and to authorize the conferring of, Honorary Degrees.

BE IT RESOLVED THAT

- (1) This Sixth Annual Meeting of the Entomological Society of Alberta petition The Senate of the University of Alberta to consider the contributions made to Scientific agriculture and to the Science of Entomology in the province of Alberta by Howard L. Seamans as being worthy of recognition from the people and the University of this province through the conferring of an Honorary Degree as Doctor of Laws at the Spring Convocation in 1959. And,
- (2) The Secretary be authorized to write to Mr. H.L. Seamans informing him of this resolution, and asking for his consent to make such a petition, and
- (3) When his consent is received the Secretary be authorized to write to Mr. A.D. Cairns, Registrar, Secretary to the Senate, University of Alberta, making a formal petition (supported by the necessary documents) for the awarding of an Honorary Degree, and
- (4) Any costs, up to a limit of \$100.00 incurred in the carrying out of this resolution be defrayed by the Alberta Entomological Society.

Explanation:-

- (1) There is no fee for an Honorary Degree. It is awarded.
- (2) Hood, cap and gown may be purchased and presented to the recipient, but the University has hoods, caps and gowns which they lend for the ceremony.
- (3) Any costs associated with the awarding of the Degree could be:
 - (a) those covering transcripts, etc. and,
 - (b) transportation to, and accommodation at the University for the Conferring of the Degree. Whether this would be necessary could only be determined through discussion with Mr. Seamans. He might want to assume this cost, or some of his friends and associates might want to assume it.
- (4) The next meeting of the Senate is October 31, 1958.

CARRIED UNANIMOUSLY

R.F. Shepherd presented the slate of officers proposed by the Nominating Committee, seconded by J.A. Shemanchuk, for

President - C.E. Brown
Vice -President - L.A. Jacobson
Secretary - R.W. Stark
Treasurer - J.A. Cook
Editor -Librarian - W.C. McGuffin
Directors - W.G. Evans
 - G.R. Hopping
 - N.D. Holmes
Director-at-Large-R.W. Salt

No further nominations came from the floor. The proposed officers were declared elected.

It was moved by R.F. Shepherd, seconded by E.T. Gushul, that the 1959 general meeting be held at Calgary. CARRIED.

The general opinion was that a joint meeting with the Saskatchewan Society was not practical and that no further action be taken for the time being.

It was moved by J.A. Shemanchuk, seconded by R.F. Shepherd, that a Committee be appointed by the Executive to investigate the matter of the Insect Collector's Guide and report to the next general meeting. CARRIED.

Chairman Ball brought up the proposal of a joint, regional publication as outlined by Dr. Prentice. It was generally agreed that the present facilities through the Canadian Entomologist were adequate. The Alberta Society meetings provided the opportunity to present and test-run papers planned for publication.

A telegram was sent to Dr. & Mrs. Hopkins congratulating the former Margaret Cumming on her marriage on October 18th, 1958.

S. McDonald presented the report of the Resolutions Committee as follows:-

a) WHEREAS, the accommodations and service provided by the Airlines Hotel have been most satisfactory and have contributed greatly to the success of these meetings.

BE IT RESOLVED, that the Secretary of the Society write a note of thanks in appreciation of their services.

b) WHEREAS, the program accommodation, publicity and entertainment committees have done an excellent job in making this meeting a success.

BE IT RESOLVED, that a vote of thanks be given in due recognition of these services.

The adoption of this report was moved by S. McDonald, seconded by W.G. Evans. CARRIED.

A resolution regarding future papers provoked vigorous discussion and was proposed separate from the Committee report.

It was moved by J.B. Gurba, seconded by J.H. Brown that,

WHEREAS, in the past, technical papers presented at the annual Society meetings have been based primarily on fundamental research, and,

WHEREAS, over one-third of our membership consists of workers interested in applied research and extension and,

WHEREAS, it is considered essential to maintain and increase interest in our Society,

BE IT RESOLVED, that an attempt be made in the future to encourage more papers of general interest to all members of the Society. CARRIED.

President, George E. Ball, offered his thanks to the Executive, Committees, the Ladies and all others who had contributed to the arrangements and proceedings of the meeting.

The meeting adjourned at 1:30 P.M.

ENTOMOLOGICAL SOCIETY OF ALBERTA

Financial Statement for year ending December 31, 1958.

Receipts

Balance as of January 1, 1958.....			\$507.50
Membership Fees:			
Ent. Soc. of Alberta - 1957.....	\$ 8.00		
- 1958.....	74.50		
- 1959.....	<u>44.00</u>	\$ 126.50	
Ent. Soc. of Canada - 1958.....	78.00		
- 1959.....	<u>54.00</u>	132.00	
Book Donation.....	1.00		
Conference Donation.....	<u>20.00</u>	<u>21.00</u>	
	SUB-TOTAL.....	\$ 279.50	\$279.50
	TOTAL.....		787.00
	LESS EXCHANGE.....		<u>1.30</u>
	TOTAL RECEIPTS.....		<u>\$785.70</u>

EXPENDITURES:-

Fees - Ent. Soc. Can.....	\$133.35
Univ. of Alta. Bursary.....	50.00
Book Prize.....	19.30
Proceedings - 1957.....	50.35
Banquet Speaker.....	38.15
Postage & Miscellaneous.....	30.00
Printing.....	31.80
Conference Grant.....	110.00
Rental of Projector.....	2.00
Bank Charges.....	<u>5.15</u>

TOTAL EXPENDITURE -	\$470.10	\$470.10
Bank Balance.....		<u>\$315.60</u>
	TOTAL.....	<u>\$785.70</u>

Audited & Found Correct
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.....
December 31, 1958.

.....
J.H. Brown, M.Sc.,
Treasurer,
Ent. Soc. of Alberta.

Report of the Library Committee

The By-Laws of the Society were changed to empower the editor-librarian to appoint a custodian for the society library. Mr. R.L. Anderson has volunteered to take on this job. The library committee culled the library material and set up a card index file. The purpose of the library is to provide a reference source for amateur entomologists, and also as a depository for literature on Alberta insects. All requests for material or the donation of reprints should be made directly to Mr. R.L. Anderson.

NOTICE TO ALL MEMBERS

The library of the Entomological Society of Alberta is anxious to obtain any reprints dealing with insects of Alberta and vicinity, collecting techniques, or revisions of genera, families, etc., which might be of value to amateur collectors. If you have any extra reprints, or can obtain extras in the future, please send them to Mr. R. L. Anderson, 11 Hunter Street, Calgary.

OBITUARY

With sadness we record that Francis Birch, one of our distinguished members, passed away April 21, 1958. Mr. Birch was born at Holborn, London, England April 28, 1894 and came to Canada in 1912. He returned to the old world in 1914 where he served in France with the Canadian Expeditionary Force during the first World War. He was invalided home with lung trouble before the war's end.

In Edmonton he worked as a painter and decorator and up until 1940 he did control work on a part time basis. In that year he decided to devote all of his energy to the extermination business and founded his own company.

He joined the Entomological Society of Alberta in 1953 and up to the time of his death was an active member. He was also a member of the National Pest Control Association. Frank will long be remembered by his friends and associates in the society.

Insect Collection Competition, 1958

The following are the winners of the Insect Collection Competition, sponsored by the Entomological Society of Alberta:

First Prize, Senior:	Andrew and Myron Basiuk, Redwater, Alberta.
Second Prize, Senior:	David Larson, 1201-24th Street So., Lethbridge, Alberta.
Third Prize, Senior:	Keith and Neil Redding, 648 - 14th Street So., Lethbridge, Alberta.
Consolation, Senior:	Jack Haberman, 3115 - 10th Avenue A.S., Lethbridge, Alberta.
First Prize, Junior:	Joe Shorthouse, 2317-13th Avenue, So., Lethbridge, Alberta.

The standard of the collections was higher than last year. Indeed, although the number of entries remains low, the standard becomes higher every year. Most of the material sent in was fully up to the standard necessary for a regular scientific collection. The winning collection contained 330 specimens, representing 8 orders, 62 families and 141 genera.

B. Hocking,
Department of Entomology,
University of Alberta,
Edmonton, Alberta.

ENTOMOLOGY SOCIETY OF ALBERTA

UP TO DATE MAILING LIST 1958 - 1959

A - Alta. Ent. Soc.
C - Can. Ent. Soc.

NAME

ADDRESS

A - Anderson, R.L.	Field Titles Service, 2nd Floor Royalite Building, 11 - Hunter Street, Calgary, Alta.
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A & C - Blakeley, P.E.	Science Service Laboratory, Lethbridge.
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A & E - Peterson, L.K.	Science Service Laboratory, Lethbridge.
A - Peterson, Lou	10710 - 116 St. Edmonton (Green Cross Co.)
A & C - Reid, R.W.	102-11th Avenue East, Calgary.
A - Robertson, R.H.	Science Service Laboratory, Lethbridge.
A & C - Salt, R.W. (Dr.)	Science Service Laboratory, Lethbridge.
- Seamans, H.L.	581 - Fraser Avenue, McKellar Park, Ottawa (Hon. Life Mem.)
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A - Stelfox, David	Site 1, R.R. #2, Edmonton, Alberta.
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A & C - Swailes, G.E. (Dr.)	Science Service Laboratory, Lethbridge.
A - Swindlehurst, E.B.S.	Provincial Department of Agriculture, Edmonton, Alta.
A - Van Veen, N.W.	Field Titles Service, 2nd Floor, Royalite Building, Calgary.
A - Virostek, J.	Science Service Laboratory, Lethbridge.
A & C - Weintraub, J.	Science Service Laboratory, Lethbridge.

ALBERTA ENTOMOLOGICAL SOCIETY
LIBRARY
ACCESSIONS 1958

- Anderson, N.H. Morgan, C.V.G. Life-Histories and Habits of the Clover Mite, Bryobia praetiosa Koch, and the Brown Mite, B. arborea M. & A., in British Columbia (Acarina:Tetranychidae). Can. Ent. Vol. XC, No. 1 January, 1958.
- Baldwin, W.F., Coppel, H.C. The Biology of Phorocera hamata A. & W. a Tachinid Parasite of Sawflies. Can. Ent. Vol. LXXXI, No. 10, Oct. 1949.
- Bradley, G.A. Notes on the Parasitism of the Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.) (Hymenoptera:Tenthredinidae) Can. Ent. Vol. LXXXIII, No. 5, May, 1951.
- Bradley, G.A. A Field Key to the Species of Cinara (Homoptera:Aphididae) of Canada East of the Rockies. Can. Ent. Vol. LXXXIII, No. 12, Dec. 1951.
- Bradley, G.A. A New Species of Cinara (Homoptera:Aphididae) from Saskatchewan. Can. Ent. Vol. LXXXV, No. 11, November, 1953.
- Bradley, G.A. A New Species of Cinara (Homoptera:Aphididae) from Saskatchewan. Can. Ent. Vol. LXXXV, No. 11, November, 1953.
- Bradley, G.A. A Field Key to the Species of Cinara (Homoptera:Aphididae) of Canada East of the Rockies. Can. Ent. Vol. LXXXIII, No. 12, Dec. 1951.
- Bronskill, Joan F., House, H.L. Notes on Rearing a Pupal Endoparasite, Pimpla turionellae (L) (Hymenoptera:Ichneumonidae), on Unnatural Food. Can. Ent. Vol. LXXXIX, No. 10, October, 1957.
- Chant, D.A. Note on the Status of Some Genera in the Family Phytoseiidae. Can. Ent. Vol. LXXXIX, No. 11, November, 1957.
- Chant, D.A. Descriptions of Some Phytoseiide Mites (Acarina:Phytoseiidae) Can. Ent. Vol. LXXXIX, No. 7, July, 1957.
- Coppel, H.C., Smith, B.C. Studies on Dipterous Parasites of the Spruce Budworm, Choristoneura fumiferana (Clem.) (Lepidoptera:Tortricidae) Can. J. Zoology, 35, (1957).
- Coppel, H.C., Maw, M.G. Studies on Dipterous Parasites of the Spruce Budworm, Choristoneura fumiferana (Clem.) (Lepidoptera:Tortricidae) Can. Jour. of Zoology, 32, 314-323, 1954.
- Coppel, H.C., Maw, M.G. Studies on Dipterous Parasites of the Spruce Budworm, Choristoneura fumiferana (Clem.) (Lepidoptera:Tortricidae) Can. Jour. of Zoology, 32:144-156, 1954.

- Cumming, M.E.P. Notes on the Life History and Seasonal Development of the Pine Needle Scale, Phenacaspis pinifoliae (Fitch) (Diaspididae:Homoptera). Can. Ent. Vol. LXXXV, no.9, Sept.1953.
- Cumming, M.E.P. Notes on the Spruce Needle Miner, Taniya albolineana Kft. (Olethreutidae:Lepidoptera). Can. Ent. Vol. LXXXVI, No.10, Oct. 1954.
- Evans, D. Field Key to Geometrid Larvae of the British Columbia Coast. Forest Zoology Laboratory, Victoria, B.C.
- Evans, David A Revision of the Genus Poecilonota in America North of Mexico (Coleoptera:Buprestidae). Annals of the Ent. Soc. of America, Vol. 50, No. 1, Jan, 1957.
- Evans, David Two-year Life Cycle of Pseudohazia eglanderina (Boisduval) (Lepidoptera:Saturniidae). Can. Ent. Vol. XC, No.2, Feb. 1958.
- Finlayson, L.R. Influence of Adult Food on Viability of Early Stages of Aptesis basizonia (Grav.) (Hymenoptera:Ichneumonidae), a Parasite of Pine Sawflies (Diprionidae). Can. Ent. Vol. LXXXIX, No. 11, November, 1957.
- Freeman, T.N. Instructive Guide for Northern Insect Survey Parties. Dom. of Can. Dept. Agriculture, 1949.
- Freeman, T.N. Two new Species of the Genus Recurvaria Haw. Pan-Pacific Ent. Vol. XXXIII, No. 1, pp. 9-13, Jan. 1957.
- Harvey, J.K. Improved Technique for Inflating and Mounting Insect Larvae. Can. Ent. Vol. LXXXIX, No. 6, June, 1957.
- Hedlin, A.F. Notes on the Life History and Habits of a Chalcid, Bruchopagus caraganae (Nik.), (Hymenoptera:Chalcididae), Infesting Seeds of Caragana. Can. Ent. Vol. LXXXVIII, No. 11, November, 1956.
- Heron, R.J. Notes on the Feeding of Larvae of the Larch Sawfly, Pristiphora erichsonii, (Htg.) (Hymenoptera:Tenthredinidae). Ent. Soc. of Ontario, 82nd Ann. Report, 1951.
- Hocking, B., Pickering, L.R. Observations on the Bionomics of some Northern Species of Simuliidae (Diptera). Can. Jour. Zoology, 32: 99-119, April, 1954.
- Leech, Hugh B. Collecting in Southern British Columbia: Hilltop to Lakeshore for Beetles. Can. Ent. May, 1947.

- Leech, Hugh B. Some Nearctic Species of Hydradephagid Water Beetles New and Old. Can. Ent. Vol. LXXX, 1948.
- Leech, Hugh B. A New North American Agabus, with notes on Other Species. (Coleoptera:Dytiscidae). Can. Ent. July, 1937.
- Leech, Hugh B. Description of a New Species of Laccornis, with a Key to the Nearctic Species (Coleoptera:Dytiscidae). Can. Ent. June, 1940.
- LeJeune, R.R. The Effect of Jack-pine Staminate Flowers on the Size of Larvae of the Jack-pine Budworm, Choristoneura sp. Can. Ent. Vol. LXXXII, No. 2, Feb. 1950.
- LeJeune, R.R., Hildahl, V. A Survey of Parasites of the Larch Sawfly (Pristiphora erichsonii (Hartig)) in Manitoba and Saskatchewan. Can. Ent. Vol. LXXXVI, No. 8, August 1954.
- Lindquist, O.H. A Technique for Pinning and Spreading Small Microlepidoptera. Can. Ent. Vol. LXXXVIII, No. 1, Jan. 1956.
- Macnay, C.G., Creelman, I.S. List of Insects and Mites Affecting Tree Fruits in Canada. Can. Dept. Agriculture, Ent. Div. Sept. 1958.
- Mank, Edith W. A Review of the Genus Serropalpus, (Coleoptera, Melandryidae). Can. Ent. November, 1939.
- Martin, J. Lynton The Bionomics of the Aspen Blotch Miner, Lithocolletis salicifoliella Cham. (Lepidoptera:Gracillariidae). Can. Ent. Vol. LXXXVIII, No. 4, April, 1956.
- Martin, John C. A new Species of Triaspis Haliday (Hymenoptera:Braconidae) from Ontario. Can. Ent. Vol. XC, No. 3, March, 1958.
- Maw, M.G., Coppel, H.C. Studies on Dipterous Parasites of the Spruce Budworm, Choristoneura fumiferana (Clem.) (Lepidoptera:Tortricidae). Can. Jour. Zoology, 31:392-403, Aug. 1953.
- Morgan, C.V.G., Anderson, N.H. Notes on Parathion-Resistant Strains of Two Phytophagous Mites and a Predacious Mite in British Columbia. Can. Ent. X.C. 1958.
- Morgan, C.V.G., Anderson, N.H. Bryobia arborea n. sp. and Morphological Characters Distinguishing it from B. preatiosa Koch (Acarina:Tetranychidae). Can. Ent. Vol. LXXXIX, No. 11, November, 1957.
- McDunnough, J. A New Race of Papilio Belonging to the Machaon Complex. Can. Ent. LXXI. Oct. 1939.
- McGuffin, W.C. Biological and Descriptive Notes on Noctuid Larvae. Can. Ent. Vol. XC, No. 2, Feb. 1958.

- McGuffin, W.C. Biological and Descriptive Notes on Noctuid Larvae. Can. Ent. Vol. XC, No. 2, Feb. 1958.
- McGugan, Blair M. Certain Host-Parasite Relationships Involving the Spruce Budworm. Can. Ent. Vol. LXXXVII, No. 4, April, 1955.
- McLeod, J.H. Note on a Staphylinid (Coleoptera) Predator of Earthworms. Can. Ent. Vol. LXXXVI, No. 5, May, 1954.
- McLeod, J.H. Notes on the Lodgepole Needle Miner, Recurvaria milleri Busck (Lepidoptera:Gelechiidae), and its Parasites in Western North America. Can. Ent. Vol. LXXXIII, No. 11, Nov. 1951.
- Prentice, R.M. The Life History and Some aspects of the Ecology of the Large Aspen Tortrix, Choristoneura conflictana (Wlkr.) (N. Comb.) (Lepidoptera:Tortricidae). Can. Ent. Vol. LXXXVII, No. 11, November, 1955.
- Putnam, L.G., Handford, R.H. Control of Grasshoppers in the Prairie Provinces. Can. Dept. Agriculture, Ent. Div. Publication 1036, April, 1958.
- Rabkin, F.B., LeJeune, R.R. Some Aspects of the Biology and Dispersal of the Pine Tortoise Scale, Toumeyella numismaticum (Pettit and McDaniel) (Homoptera:Coccidae). Can. Ent. Vol. LXXXVI, No. 12, Dec. 1954.
- Raizenne, Henri. Forest Lepidoptera of Southern Ontario and Their Parasites. Can. Dept. Agriculture, Div. Forest Biology, March, 1952.
- Ross, D.A. Key to the Puparia of the Dipterous Parasites of Choristoneura fumiferana Clem. Can. Ent. Vol. LXXXIV, No. 4, April, 1952.
- Ross, D.A. Key to Puparia of the Dipterous Parasites of Malacosoma spp. in British Columbia. Ent. Soc. of British Columbia, Proc. (1952), Vol.49, June 15, 1953.
- Silver, G.T. Studies on the Silver-spotted Tiger Moth, Halisidota argentata Pack. in British Columbia. Can. Ent. Vol. XC, No. 2, Feb. 1958.
- Smith, Stanley C. Reproductive Isolation and the Integrity of Two Sympatric Species of Choristoneura (Lepidoptera:Tortricidae). Can. Ent. Vol. LXXXV, No. 4, April, 1953.
- Smith, Stanley G. The Cyto-taxonomy of Coleoptera. Can. Ent. Vol. LXXXII, No. 4,

- Tripp, Howard A. Description and Habits of the Spruce Seedworm,
(Laspeyresia Youngana (Kft.) Lepidoptera:Olethreutidae).
Can. Ent. Vol. LXXXVI, No. 9, Sept. 1954.
- Tripp, Howard A. Descriptions and Habits of Cecidomyiidae (Diptera). Can.
Ent. Vol. LXXXVII, No. 6, June, 1955.
- Tripp, Howard A. The Instars of a Maggot (Pegohylemyai) Inhabiting White
Spruce Cones. Can. Ent. Vol. LXXXVI, No. 4, April, 1954.
- Underwood, G.R. The External Morphology of the Five Forms of Pinus
pinifoliae (Fitch) (Homoptera:Phylloxeridae) Can. Ent.
Vol. LXXXVII, No. 5, May, 1955.
- Wallis, J.B. A New Species of Dytiscus Linn. (Coleoptera, Dytiscidae).
Can. Ent. Vol. LXXXII, No. 2, Feb. 1950.
- Watson, W.Y. A Description of the Immature States of Lithocolletis
salicifiliella Cham. (Lepidoptera:Gracillariidae).
Can. Ent. Vol. LXXXVIII, No. 4, April, 1956.
- Watson, W.Y. Two New Species of Coccinellidae (Coleoptera) Can. Ent.
Vol. LXXXVI, No. 1, Jan. 1954.
- Wishart, Geo. Surveys of Parasites of Hylemya spp. (Diptera:Anthomyiidae)
that Attack Cruciferous Crops in Canada. Can. Ent. Vol
LXXXIX, No. 10, Oct. 1957.
- Wong, H.R. Cocoons of Some Sawflies that Defoliate Forest Trees in
Manitoba and Saskatchewan. Ent. Soc. of Ont. 82nd Ann.
Report, 1951.
- Wong, H.R. Common Sawflies Feeding on White Birch in the Forested
Areas of Manitoba and Saskatchewan. Can. Ent. Vol.
LXXXVI, No. 4, April, 1954.