

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



CALGARY - ALBERTA

OCTOBER 2ND - 3RD, 1953

Proceedings of the
ENTOMOLOGICAL SOCIETY OF ALBERTA

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ORGANIZATION MEETING

The Entomological Society of Alberta was formed on November 27, 1952, at the Science Service Laboratories, Lethbridge. The meeting was called by C. W. Farstad, Director at Large of the Entomological Society of Canada, who presided during the organization proceedings.

After the nominating committee had reported, the following were elected as officers to serve until December 31, 1953:-

President	- E. H. Strickland
Vice-President	- R. H. Painter
Secretary	- L. A. Jacobson
Treasurer	- G. A. Hobbs
Editor-Librarian and Director to National Society	- R. W. Salt
Directors	- H. Hurtig
	- W. C. McGuffin
	- T. Kilduff

The meeting continued with E. H. Strickland as chairman. A proposed constitution and by-laws were discussed and adopted after revision. R. H. Painter donated a leather scroll, on which the charter members signed their names, as a permanent record of the formation of the Entomological Society of Alberta. The meeting concluded with unanimous approval of the motion that the new Society foster entomology "for its own sake" and that amateurs and students be encouraged to join the new society.

EXECUTIVE MEETING

During the year several executive meetings were held to make arrangements for banking, the printing of official stationery, the selection of time and place of the first annual meeting, and the transaction of routine business.

An early outcome of these meetings was the incorporation of the Entomological Society of Alberta under the Societies Act of Alberta on February 19, 1953.

FIRST ANNUAL MEETING

(Held in the Laboratory of Forest Pathology,
102 - 11th Avenue E., Calgary,
Oct. 2 and 3, 1953)

1. Social Evening, Oct. 2

An informal social evening, at which members had an opportunity to meet each other and to renew acquaintances, got under way at 8 p.m. After refreshments, the gathering enjoyed a series of color transparencies shown by D. S. Kusch of the Calgary Forest Insect Laboratory. These demonstrated the methods used by forest rangers in making surveys and illustrated many of the insects in a very clear and attractive manner.

2. General Session, Oct. 3

At 9:00 a.m., October 3, the president opened the meeting by calling on G. R. Hopping, Forest Insect Laboratory, Calgary, who welcomed the members. Professor E. H. Strickland then gave the presidential address entitled, "Entomology in the early days of Alberta". Following this, a panel discussion on the future role of the Entomological Society of Alberta was held, led by G. A. Hobbs, B. Hocking and Kenneth Bowman.

After a recess for lunch entomological papers and reports were presented under the chairmanship of R. W. Salt, Program Chairman.

3. Business Session, Oct. 3

The annual business meeting was held after the paper reading session. Four regional directors, G. A. Hobbs of Lethbridge, H. Hurtig of Suffield and Medicine Hat, G. R. Hopping of Calgary, and B. Hocking of Edmonton, were appointed to implement the program to encourage amateur entomologists. A motion was passed to assess all members one dollar for a special

fund for prizes and awards. It was also decided that the Entomological Society of Alberta sponsor an annual cash award of \$50.00 to a student of entomology at the University of Alberta. The conditions of the award and the selection of the recipient would be administered jointly by a committee from the Society and members of the staff of the Department of Entomology at the University.

The report of the nominating Committee was received, and the following officers elected for 1954:-

President	- R. H. Painter
Vice-President	- G. R. Hopping
Past President	- E. H. Strickland
Secretary	- S. L. W. Mann
Treasurer	- B. Hocking
Editor-Librarian	- S. McDonald
Director to National Society	- R. W. Salt
Directors	- A. M. Harper
	- R. Reid
	- R. D. McMullen

Miss Margaret R. Mackay, who had accepted a position in Philadelphia, U. S. A., was presented with a travelling clock by the President on behalf of the executive and members of the Society in appreciation for designing the insignia of the Society.

A vote of thanks was extended to the Calgary members for arranging the refreshments and place of meeting and to V. J. Nordin, Officer-in-Charge, Forest Pathology Laboratory, for extending the facilities of the laboratory as the site of the first annual meeting of the Entomological Society of Alberta.

A list of the members of the Society is given on pages 23-26 and the financial statement for the year 1953 on page 22.

PANEL DISCUSSION

"The Future Role of the Entomological Society of Alberta"

G. A. Hobbs, B. Hocking, K. Bowman

The discussion was opened by G. A. Hobbs, who listed a number of suggestions for future action, including encouraging amateurs, both students and teachers; giving talks and demonstrations in schools and youth groups; offering prizes for entomological collections and exhibits at fairs; promoting meetings between professionals, amateurs, and teachers; disseminating information of value or interest on insect control or the encouragement of beneficial insects; giving radio talks on interesting topics; recruiting entomologists for professional services.

B. Hocking expressed general agreement with G. A. Hobbs but took exception to the distinction between amateur and professional. The professional should be an amateur as well. He also felt that the Society should stay out of the field of extension since adequate services already exist.

Kenneth Bowman favoured the encouraging of children early in life, before high school age. B. Hocking thought that many prospective amateurs were discouraged by the difficulty of securing entomological supplies, particularly pins. He suggested that worn equipment usually thrown away by the laboratories should instead be turned over to schools. Much of the equipment, K. Bowman stated, could be made by children.

There was considerable discussion on the suitability of the 4-H clubs, Boy Scouts, Girl Guides, and other such groups as prospective grounds for planned programs. R. H. Painter thought the 4-H groups were too old and that their entomological interests at that time, if any, would be on the control of agricultural pests. L. A. Jacobson and E. H. Strickland felt that Cubs and Boy Scouts might be better than the schools, to start with.

N. D. Holmes suggested that papers given at the Society's meetings should be designed to interest the amateur. A. M. Harper felt that the Society should aid in making amateurs out of some of the professionals. Being a specialist should be no bar to taking an interest in entomology in off hours. H. Hurtig mentioned that proper

encouragement of amateurs by the Society would make more and better students available to the professional services. A. M. Harper and G. E. Swailes both supported an active program of exhibits, demonstrations, and entomological tours.

L. A. Jacobson then moved that a four point program be accepted:-

1. To stimulate and sustain interest in entomology among boy scouts, girl guides, school classes in biology and others by providing prizes, giving talks, or otherwise encouraging the collecting of insects.
2. To stimulate interest among our own Society members to widen their entomological interests and to direct future programs to optics of a more general nature.
3. To contact naturalist groups and societies in the province for interchange of information and as a source of new members.
4. To further our own Society by a public relations program through the radio, newspaper, and farm weeklies.

Seconded by P. E. Blakeley. Carried.

PRESIDENTIAL ADDRESS

"Entomology in the Early Days of Alberta"

E. H. Strickland

Your programme committee, in honouring me by asking me to address you at this time, wisely handed me a ready-made topic with the suggestion that I confine my remarks to this. The intention underlying their action was admirable. It was that a record be made of the early entomological enthusiasts of our province before their names and memory be forgotten or, to a large measure, be supplanted by the activities of their more recent replacements. All were amateurs. I employ this word in its original sense, implying those who pursue a definite line of action simply

for the love of so doing; certainly with no suggestion of financial security and, usually, at considerable cost to themselves. More recent professionals, which class includes the majority of us, whose efforts are inescapably interwoven with the prospect of a monthly cheque, owe a deep debt of gratitude to our predecessors.

Entomology, to them, was a relaxation from very diverse daily occupations among which I can list, in alphabetical order, bank manager, chartered accountant, farmer, museum curator, rancher, registrar of births, deaths, and marriages, school-teacher, shoemaker and station agent.

Naturally, for the majority of them, collecting and recording some portion of the vast hitherto completely unknown insect fauna of this region was their major interest. Pressure of the daily round rarely permitted many of them to undertake continuous biological investigations, but they gave of their best to their chosen line of endeavour. To the professional entomologist, such painstaking collection and critical collation of material may be too closely akin to his daily grind for it to appeal to him as a relaxation. It must be for this reason that this essential phase in an overall picture of the entomology of our province is a field into which the professional rarely strays. He gets along as best he may with little personal knowledge of what it has to offer and must rely on others, frequently the amateur, to supply his needs at second hand when occasion arises. Let us readily admit that such inhibitions are natural. They do, however, point up the fact that the professional still needs the assistance of the whole-hearted amateur. Great as is this need, the latter has almost completely disappeared from our province. Is it possible that this Association might succeed, even to a small measure, in inducing a few of the rising generation to take his place? If so, it would be a wonderful, though praiseworthy selfish, objective. As professionals, we have our technical societies and journals. These are essential to us in our daily routine but, for the greater part, they are dry as dust to those blessed with having been born with the urge to study simply for the love of it. The few who survive so chilly a reception to entomology may, in their youth, follow their natural inclinations so persistently that, by the time they are mature, they land a professional appointment in this subject. From that time on, their acquired inhibitions take charge and, in company with St. Paul, they put childish things behind them. We, however, still need the services of the amateur in filling the gaps we inevitably leave while pressing forward with our more concentrated projects.

All of this is by way of introduction to my assigned topic and is given to lend contrast to what I am in a position to say regarding the days when amateur entomologists were in their prime in Alberta. I cannot claim to be well equipped to undertake my duties. My personal knowledge of the province dates back to 1913 in the spring of which year I reported to Lethbridge in order to initiate studies on the control of the pale western cutworm. It soon became increasingly obvious to me that my field studies were seriously hampered by my complete lack of knowledge of the vast array of other phalaenids and potential predators or parasites which I encountered almost daily. Many of these undoubtedly might have some bearing on my more diversified problems after I had demonstrated that baiting was well-nigh useless in connection with pale western cutworm control. True, I had been instructed to spend my leisure hours in making general collections and in sending the results to Ottawa. I did so faithfully for a couple of years but, on my annual visits to the east, I saw that my pile of Schmitt boxes, placed on the most inaccessible shelf in the collection room, had already reached the ceiling. I decided, in future, to devote more of my leisure time to tennis. In this connection, it is only fair to state that, in 1913-15 there was no Systematic Entomology Unit in Ottawa.

By some indirect means, however, I had learned by 1914 that, far to the north of Lethbridge, there were a number of enthusiastic amateur entomologists who even shared with other naturalists an Alberta Natural History Society in the town of Red Deer. For a number of years this Society had operated under a Provincial charter and, during the years of its active life, it produced three entomological publications, with the aid of Government grants. The Society ceased to function actively in the early 20's but I learned, recently, that the charter has been retained and that surviving members still meet, in each other's houses, to discuss their mutual interests. I was fortunate, at the end of the first war, in making the acquaintance of several of the then active entomological members of whom, alas, the majority are now dead and one, only, Mr. Kenneth Bowman still resides in Alberta. It is, however, of these early amateur entomologists that I have been asked to speak to you today.

How I first heard of F. H. Wooley-Dod I do not remember but in my inability to obtain adequate information regarding the species of the Phalaenidae which I encountered in such vast numbers at Lethbridge, I took someone's advice to write for help to the man who was recognized as "one of the two leading Lepidopterists on the North American Continent". An immediate reply to my letter invited me to bring as many of my problems as I could conveniently carry to Midnapore.

From here I would be driven 12 miles into the foothills where Dod, a bachelor, lived almost the life of a hermit on his ranch. As I descended from the train I was met by Dod's assistant W. H. T. Tams. Within two days, my most pressing questions had been answered. Dod had raved over, and had relieved me of, certain captures I had made in the more arid portions of the province which he had been unable to visit. He had, however, more than replaced these with species which I had failed as yet to capture. In addition, he had given me a set of some 200 pages of separates, written by himself, on the Lepidoptera of Alberta. These had appeared in the Canadian Entomologist and other Journals. They were dated from 1901 to 1913. These were not simply lists of species for they included critical analyses of taxonomic concepts and were interspersed with notes of biological importance.

Fortunately for Dod as well as for us, he was a man of independent means. He did not hesitate, every few years, to drop all local interests and to travel to the British Museum in London or to the Smithsonian in Washington to the mutual benefit of everyone concerned. On one such visit to England he met Tams, the son of a photographer in Cambridge. He was so well versed in his father's art that he found frequent employment around the University laboratories. I gather that he had, at that time, no particular leaning towards entomology but he agreed to accompany Dod to Midnapore. Here he became an all-consuming pupil of Dod, absorbing much of his taxonomic knowledge, rearing many species, making genitalia mounts to confute the taxonomists of the day and putting to good use his knowledge of the infant art of colour photography as applied to Lepidoptera.

But the first world war was to upset all our lives. Dod, though manifestly unfit for active duty, obtained a commission which took him to Macedonia where, on 24 July 1919, he succumbed to enteric.

On my return to Canada shortly after the close of the war, one of my duties was to crate and to freight Dod's huge collection to Ottawa where it was to be incorporated by McDunnough in the National Collection. Some weeks later, I was very pleased to hear from McDunnough that the collection had arrived in Ottawa in first-class condition.

And what became of Tams? When Dod enlisted, he returned to England and, without further preparation, was appointed curator of Lepidoptera to the British Museum of Natural History. Could a more fitting tribute have been paid to the influence of Dod? I gather, from recent publications, that Tams still occupies that position.

Rivalling Dod as an early student of Albertan Lepidoptera is Kenneth Bowman. His magnificent collection is still at his home in Edmonton. I feel sure that he would be only too glad to show it to any of you when you are visiting that city.

Equipped with a thorough knowledge of the Macrolepidoptera of England, Bowman came to Alberta in 1904. He immediately began to adapt his knowledge to local conditions with the result that, by 1919, under the auspices of the Red Deer society, he was able to publish, from this province, a list of over 900 species in this group. In collaboration with other collectors in Macrolepidoptera, the field in this group had been well covered. Bowman now turned his attention to the almost completely disregarded problem of gathering information on the Microlepidoptera of Alberta. Not only did collecting and mounting these moths, many of which are exasperatingly minute and delicate, present their own problems but he was faced in addition with the difficulty that practically no one on the continent possesses the requisite knowledge to appraise them taxonomically. With commendable persistence, Bowman approached specialists in various groups and was so successful in his quest that, by 1951, he was in a position to publish a completely revised list of all of the named Lepidoptera known to occur here. Though this list comprises more than 1,800 entries, there still remain nearly 100 species in the Bowman collection which, at the present time, no one will attempt to name. A reason given by one specialist is that many are new to science.

Among other early Lepidopterists, mention must be made of Donald Mackie, for many years registrar of births, deaths, and marriages for this province. Failing eyesight in the late 40's somewhat curtailed his activities. Upon his retirement to the coast, he generously donated his fine collection to the University.

It is probable that few of the old-timers could equal Norman B. Sanson as an all-round naturalist. His activities were more varied and more colourful than were those of his fellow enthusiasts. Mr. G. Paris of Banff has generously supplied me with the following information. Born in Toronto, he came west with the Queen's Own regiment to assist in quelling the rebellion of 1885. He stayed in Calgary till 1892 when he moved to Banff for work in its sanatorium. He was already an all-round naturalist. He collected everything but was particularly interested in insects. With the opening of the Banff museum his appointment as director was a logical step. Here he compiled a

vast amount of original data upon the fauna of the district though little use has been made of his invaluable contributions. Upon his retirement, some 10 years ago, the museum ceased largely to function as such and Sanson's collection and notes fell into what is today described as "a very bad shape". Last year, I understand, Ottawa sent out a man to try to reorganize them, while there are plans afoot to re-establish the museum as a first-rate institution. It is hoped that much of the information Sanson gathered in his very active life will at long last be made available for the use of others. For his own part, he was never very communicative but, with his death in about 1951 at the advanced age of 86, the study of the Natural History of Alberta suffered a serious loss.

It was not only to Lepidoptera that the earlier entomologists confined their particular attention. Most of my audience must surely be familiar with the monumental contributions made by F. S. Carr to a knowledge of the Coleoptera of this province. Again, in Carr, we possessed an all-round naturalist, but it was to beetles that he devoted his unstinted attention. Born in Cobourg, Ontario, in 1881, as a boy and young man he made an intensive study of the beetles of that province. This enabled him rapidly to adapt the knowledge he had gained there to local conditions when, in 1909 he came west to teach in an Edmonton high school. As a result, by 1920, he was already in a position to publish through the auspices of the Red Deer society a list of over 500 species of Coleoptera which he had collected in the northern part of this province. From that time onward, to the year of his death in 1933, he devoted all of his spare time to the collection and the taxonomy of Coleoptera. Every year, he published supplementary lists of captures from this province in the Canadian Entomological Record or the Canadian Entomologist. These reached the impressive total of well over 1,400 species. His collecting acquired a great impetus when, in about 1921, he accepted the appointment of School Inspector at Medicine Hat. Carr was in constant contact with the leading coleopterists of this continent and he made extensive exchanges with many of them.

In 1939, Mrs. Carr most generously donated his entire collection to the University of Alberta. It took several years to re-arrange this material from the boxes in which it was stored but, by considerable "squeezing", it was ultimately housed in 58 glass-topped 18" x 24" drawers. It contains somewhere in the neighbourhood of 100,000 specimens, representing species from many parts of North America. At the time of his death, Carr was devoting his major energies to collecting and classifying the Staphy-

linidae and the Curculionidae of this province. As might be anticipated, the bulk of his locally collected material in the first family was still unnamed but, in the latter, he had already attached many labels to series as tentative determinations.

In all families, however, this collection should prove to be a mine of information to anyone who is qualified to appraise it effectively. In conjunction with it, Carr maintained a card catalogue of all Albertan species. On several of the cards are brief notes concerning habitats and habits of the species recorded.

Although he resided in Alberta for a few years only before he was transferred to British Columbia, Mr. F. C. Whitehouse, Red Deer bank manager, made a valuable contribution to a knowledge of the Odonata of this province. He collected extensively and, in 1918, the Natural History Society published his illustrated key to the dragonflies of Alberta. In this, he keyed out all species which he knew to occur here and added others which he felt assured must be represented even though, at that time, there was no record of their having been captured in this area.

Probably the most unusual order to receive diligent attention from an early resident of Alberta is that of Siphonaptera. I do not know how Baron Rothschild learned of Percy Gregson's potentialities as a collector in this group. From as early as in 1895 there are records that he was collecting Albertan fleas in the vicinity of his farm at Blackfalds. From that time onward, till his death, he continued to collect them for Rothschild.

With the above names, I have briefly summarized some of the characteristics of a few of the earlier entomologists of our province. Mr. Bowman has very kindly given me a list of others who contributed, though probably to a lesser degree, in gathering early information that ultimately found its way into print. Apparently the earliest records of insect collecting in Alberta must be attributed either to a Mr. Bean, reputed to have been a C. P. R. official stationed at Laggan, or to a Mr. A. Hudson who, from Dod's account, appears to have been living near Midnapore before Dod arrived there. Both made collections of Lepidoptera at least as early as in 1890. Several species were named in their honour by American specialists. Of C. G. Carrett of Didsbury and T. N. Willing of Olds, little can be said other than that the names of both appear in the literature of about 1903 as collectors of Lepidoptera.

Mr. Baird, of High River, was an ardent and versatile collector in all orders, though he appears to have been particularly partial to Diptera. Some years before his death, he sold the bulk of his collection and, in so far as I know, nothing has been heard of it since.

From 1904-07 a Mrs. Nicholl visited Alberta regularly from England. It is stated that her purpose was to collect Lepidoptera for the British Museum. Presumably her captures are still there though nothing seems to have appeared in the literature regarding them. Her chief area of operations was deep in the mountains in the neighbourhood of the Columbia ice fields.

This, ladies and gentlemen, completes the record of what I have to tell you of the earlier workers who devoted their leisure hours to the self-appointed task of compiling for all who follow some record of the insects which they encountered in Alberta. An interesting, and I hope challenging, concomitant to their labours is the fact that, though the correct determinations have been amply substantiated, many of their interesting captures have never, subsequently, been duplicated, even in the much-travelled field of Lepidoptera. How many further new records await the net of diligent collectors? This field, obviously, is still wide open for anyone who elects to follow in their steps.

SUMMARIES OF PAPERS PRESENTED AT FIRST ANNUAL MEETING

"Some Parasites and Predators of Lodgepole Pine Bark-Beetles"

R. W. Reid
Laboratory of Forest Biology
Calgary, Alberta

The bark-beetle complex found within the lodgepole pine stands west of Rocky Mountain House, Alberta, contained Dendroctonus valens Lec., Dendroctonus murrayanae Hopk., Ips pini Say., Ips guildi Blackman, Polygraphus rufipennis Kirby, Pityogenes knechteli Sw., Orthotomicus sp., and Hylastes asper Sw.

Members of the following families were associated as parasites and predators: Hymenoptera, two species of Ichneumonidae, two species of Braconidae; Diptera - one species of Dolichopodidae; Coleoptera - one species of Ostomidae, one species of Histeridae, one species of Cleridae; Hemiptera - one species of Anthocorinae; Acarina, one species of mite. Positive identifications are not as yet available on these.

The ichneumonid parasites oviposit through the bark after locating the presence of larvae. Both species appear to act as external parasites. Elongated, fragile, tan coloured cocoons are constructed within the bark-beetle galleries in the fall, adult ichneumonids emerging in the spring.

One braconid oviposits through the bark, feeds as an external parasite on the host, overwinters in the galleries as a bare pupa and emerges in the spring. The other braconid was found emerging from fully mature dead adult Ips pini. The habits of this species are not well understood.

The most common dipterous predator, tentatively identified as Medetera aldrichii Wheeler, oviposits near or inside the bark-beetle entry hole. The larvae are predaceous, very active, moving at will through the galleries. They spin cocoons in the fall, emerging in the following spring.

Among the coleopterous predators, the one species of Cleridae appeared to exert the greatest effect as a natural factor. This species, Thanasimus undatulus Say, lays eggs singly under bark scales in the vicinity of the bark beetle entry hole. Young larvae move into the galleries. Mature larvae of this predator are able to attack and destroy adult bark beetles. In the fall mature larvae, now in their fourth instar, leave the galleries, overwintering in the duff. In the spring they pupate, emerging soon after as active adults.

The one predator belonging to the Hemiptera occurred in small numbers and feeds principally on bark-beetle eggs.

The most important egg predator is a small translucent mite. Gravid females of this mite attach themselves to the eggs of the bark-beetle. Some of their eggs are exuded while the rest appear to rupture out, and the female mite dies. Upon hatching, the young mites destroy the bark-beetle egg by their feeding and then move into the main gallery. They appear to complete their development feeding on the moist organic material found within the galleries. When the mites reach maturity they attach themselves within the posterior elytral declivity of the adult Ips pini. In the spring these mites are carried by the bark-beetle to fresh galleries where they detach themselves and attack the eggs.

"Rearing Forest Tent Caterpillars"

R. D. McMullen
Suffield Experimental Station
Ralston, Alberta

Larvae reared in glass containers form a silken mat on the sides of the container to which they return to moult. This silken mat corresponds to the silken mat which colonies of larvae spin on the trunks and boughs of trees to rest on at night. Removal of a larva from the silk mat in a rearing container late in the moulting process results in inability to complete the moult successfully. The larva appears to be unable to re-attach to the mat or to spin a new one. Such larvae eventually die.

"Problems Associated with
the Sampling of Aircraft Sprays"

S. L. W. Mann
Suffield Experimental Station
Ralston, Alberta

There are two basic reasons for sampling ground deposits obtained from insecticide dispersal apparatus. The entomologist wants to relate ground deposits to mortality data; the engineer uses the information to assess the performance of the spray apparatus, e.g., effective swath widths and droplet spectra.

The engineer can control all of the required conditions except weather. Good meteorological conditions are transitory, and consequently any sampling procedure is dictated by the time and manpower available. Sampling lines are placed parallel to wind direction and sampling stations are located at various points along these lines. The spray is usually coloured with a red dye and petri dishes are used to sample the ground deposit. The spray falling on the dishes is analysed colorimetrically. Droplet distribution, size, and count is satisfactorily determined on paper cards with special fibre length. Formerly the cards were examined under a binocular microscope or a projection microscope. Now the cards are photographed while the dye colour is still quite

strong and analysed later. By calculation, a measure of gallons of spray per acre is obtained. The petri dishes give a corresponding figure plus evaporation losses. The difference, allowing for small errors caused by dye fading, gives a measure of evaporation, or loss of spray, and some idea also of the final concentration of the spray.

"Some Applications of Plastics in Entomology"

B. Hocking
Department of Entomology
University of Alberta

The use of unsaturated polyester resins for embedding insect specimens for classroom and museum purposes has already been described (Hocking, 1953). An account of the use of polyethylene stoppers for vials for the storage of specimens preserved in alcohol is in press (Strickland, 1953). The purpose of this note is to draw attention to some more of the many ways in which the entomologist may make use of plastics.

The acrylic resins sold under such trade names as lucite, plexiglas, perspex are useful for many general purposes around the laboratory. They are obtainable in the form of sheets, rods, and tubing, both transparent and coloured. They are lighter than metals, nearly as strong, and much more readily machined and worked. Very strong cemented joints may be quickly and conveniently made with a solution of the material in ethylene dichloride. Special shapes and sizes of dissecting dishes, rearing cages and other containers are easily made. Saran screening, another plastic product of wide use in entomology may be cemented to lucite with the same mixture. Many other items, including mounted needles, forceps, and clips for holding living insects can be made of this material. Its thermal properties and flexibility make it much easier on the insect than glass and metals. This, and other plastics are also useful for making demonstration models of insects or parts of insects. Many plastics are strangely similar to the insect integument in their mechanical properties, so that even a rather complex mechanism like the insect thorax and wings can readily be imitated in plastic.

Of more interest to the taxonomist and the amateur collector are plastic cements for mounting small insects on points or on the side of pins, and a plastic pinning board as a substitute for cork. The first of these are the Vinylite adhesives, solutions of vinyl acetate resins in acetone or methyl acetate. The preferred adhesive is Vinylite MA-28-14, a 28 per cent solution in methyl acetate. This material dries more rapidly than shellac, and is more elastic and versatile. For the heavier insects it may be rapidly thickened by exposure to the air. For more delicate specimens it may be thinned to any desired extent by the addition of ethyl acetate, which the hymenopterist commonly carries with him anyhow as a killing agent.

The plastic pinning board is apparently a foamed polystyrene. This is on the market in Germany under the name Riplex in sheets 1.3cm. thick at 1/3 of the current price of balsa wood, 1/4 of the price of composition cork, and 1/15 of the price of sheet cork. It is more uniform than any of these, white in colour, lighter in weight, and is claimed to be non-corrosive and vermin proof. A sheet of this material on the bottom of a well made transparent or suitably coloured plastic box, would prove superior in most respects to the conventional Schmidt box and could be produced at about 1/3 of the cost.

Finally, in the economic field, plastics have been under consideration for some time as substitutes for bees-wax in commercial honey production. In the first place attempts have been made to produce sheets of plastic foundation on which waxen cells would be built. Best success had been achieved with polyethylene (Root, in litt. 1950) but I have also had cells built on foundation made of ethyl cellulose, and on a co-polymer of vinyl acetate and vinyl chloride. In Russia success has been reported with celluloid dipped in wax (Babaev, 1950). There is an increased tendency with all of these materials, for the bees to construct drone cells on them instead of worker cells. In Germany, drawn comb has been made from a polyesterol (Osterholzer, 1950; Anon. 1953) and in England from acrylic resins (Stanley, in litt. 1949) and in both places apparently honey was stored in the cells and the queens laid eggs in them. In England also, a plastic bonded paper material produced for aircraft and building construction has a honeycomb form and appears worth investigation for this purpose. The same material incidentally is also made in larger mesh sizes which are useful in the laboratory for holding test tubes, or vials of alcoholic specimens.

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"Rearing Prairie Species of Mosquitoes"

I. S. Lindsay
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Culiseta inornata is a large, common species suitable for insecticide studies. A continuous culture can be maintained without the interruption of any diapause. An important factor is the provision of correct conditions for mating. Culiseta inornata will mate in confined cages, but Culex tarsalis requires special light conditions. By reducing light intensity to that approximating twilight, mating can be stimulated.

Large numbers of mosquitoes are required for laboratory research into a variety of problems that have shown up in the field when working with the northern species. Until these species can be successfully cultured with artificial media, laboratory investigations must be conducted using the prairie species. Culiseta inornata and Culex tarsalis.

"Records of Myiasis by Wohlfartia"

E. H. Strickland
Department of Entomology
University of Alberta.

One or two cases of myiasis were reported in Alberta in 1930, and since then it has occurred throughout most of the province. Both human beings and animals were infested. Two species were formerly thought to be involved, W. vigil and W. opaca. The former is now thought to be a synonym of the latter, since our reared males were all vigil and the females all opaca. There are two generations per year.

The flies place their larvae preferably on young animals or babies. The first generation adults are flying in May and June when the young of many animals are available. Adults are commonly found at sweet clover blossoms in southern Alberta. In 1948 there was a serious outbreak on mink pups in northern Alberta. Foxes, cats, and dogs are also attacked, while gophers possibly serve as a common host.

It is the second generation which may frequently infest infants. The larvae are apparently placed only on wet hair. Young children that have been put outdoors and have cried themselves to sleep are probably attacked in the region of the wet eyelashes. The larvae usually look for a hiding place before burrowing into the flesh and so they often enter folds in the neck. The larvae are generally noticed in pimples on the skin and are readily squeezed out.

Mr. W. Haufe, Livestock Insect Laboratory, Lethbridge, reported an infestation by Wohlfartia of a kitten. Three larvae were removed from the axilla of a hind leg.

"Physical Properties of Sprays
as Related to the Control of Spruce Budworm"

H. Hurtig
Suffield Experimental Station
Ralston, Alberta

(Aided by reports from J. J. Fettes, A. P. Randall
and W. W. Hopewell)

The work reported on is a part of a larger field dealing with the relation of biophysical factors to the chemical control of insects. In the spruce budworm work, relationships were sought between the degree and quality of biological effect of the spray deposited in terms of (a) mass of insecticide; (b) volume of spray material; (c) droplet size; (d) droplet number, per unit area. Other physical factors such as wetting and spreading of the spray deposit and the effect of the vapor and aerosol fractions were recognized but not included in the investigations.

Large scale plots, from 900 to 450 yards up to a square mile, were necessary to obtain adequate sampling and to cover the variations in spray deposit. Sampling was carried on in and under trees and in open areas. Mortality data were corrected for natural mortality as evidenced in unsprayed plots.

The assessment of the deposits showed that a consistent and significant underdosing of the downwind side of tree foliage was obtained. Foliage retained 50 to 60 per cent of the spray in any case. Ground deposits naturally contained a higher proportion of small drops than foliage deposits.

Although no correlation could be established between deposit in pounds of DDT or volume of spray and biological effectiveness, it was possible to relate droplets per square centimeter and mortality. Droplet size in the trees ranged from 175μ to 300μ mean median diameter, with a mean of 248μ . Two drops per cm^2 in this range give the LD_{50} and 12 drops per cm^2 the LD_{95} . All doses over 17 drops per cm^2 produced complete kills.

Earlier laboratory investigations showed that young larvae were more susceptible to minute amounts of DDT than older larvae. In field experience, chemical control of older larvae is often applied too late to prevent severe

defoliation. It may therefore be preferable to accept a lower order of kill in the earlier instars provided that a high degree of prevention of defoliation is thus achieved. Further improvement in control of early instars may possibly be achieved by the use of a larger drop size and the addition of adjuvants to promote the penetration of host buds via wetting and spreading.

"Forest Insect Problems of the Rocky Mountain Region"

G. R. Hopping
Forest Zoology Laboratory
Calgary, Alberta

Forest fires play a very important part in the succession of tree species and the consequent succession of insects. After an area has been burned over, the regeneration is either aspen or lodgepole pine. Spruce often comes in under the pine and under the aspen at lower elevations, and balsam fir and spruce under the pine at higher elevations. The aspen and pine mature and drop out in time, leaving pure stands of spruce in the lower valleys and spruce and balsam at higher elevations. Limited pure stands of Alpine fir appear still higher. Theoretically fairly pure stands of Alpine fir should replace other trees on sub-alpine sites.

Bark beetles successfully remove the older trees in the high Alpine fir stands, resembling to some extent a selection cut, making way for younger, vigorous trees. The two-year cycle spruce budworm occurs in some of the mixed stands, but during the last 20 years at least, the budworm population has never been high enough to cause appreciable tree mortality. Most of the insect trouble occurs in the aspen and lodgepole pine stands. The lodgepole pine bark beetle attacks trees over five inches in diameter, and the lodgepole pine needle miner develops huge outbreaks in stands of all ages; the Aspen tortrix, forest tent caterpillar, and American leaf beetle attack the aspens. The fire-succession, transition types of stands are very susceptible to insect outbreaks, while the climax stands are more resistant. This suggests a silvicultural approach to some of the entomological problems, by utilizing the pine and releasing the spruce understory, thus hastening the conversion to a stand with a high percentage of spruce.

"Notes on the Black Army Cutworm,
Actebia fennica (Tausch.)"

L. A. Jacobson
Field Crop Insect Section
Lethbridge, Alberta

During 1953, larvae of the black army cutworm, Actebia fennica (Tausch.), defoliated extensive plantings of alfalfa in the Okanagan and Elk Valleys of British Columbia and were also found infesting creeping red fescue on the Dominion Experimental Station at Lacombe, Alberta.

Outbreaks of the black army cutworm have been recorded in the past from many areas of Canada and the United States. It is interesting to note that E. H. Strickland collected this species among a collection of red-backed cutworms at Blackfalds in 1919. Crops destroyed by the black army worm indicate a wide preference in food plants. In Maine, New Hampshire and New Brunswick, this insect was a limiting factor in blueberry production. In British Columbia, alfalfa and in some cases clovers were most severely attacked. Other food plants include leaves of oak, black walnut, poplar, apple, Manitoba maple, cherry, horse chestnut and elm; most garden crops and a variety of weeds and flowers are also eaten.

Investigations were conducted in 1953 on biology and control in the Elk Valley a few miles north of Natal, B. C.

The larvae live over winter, feed in the early spring, and start to pupate in June. The moths emerge about July 15 but apparently aestivate until late August and early September. At this time they lay their eggs, which hatch a week or so later. The larvae are surface feeders and when abundant are almost armyworm in habit. When fully grown they are about $1\frac{1}{2}$ to $1\frac{3}{4}$ inches in length, velvety black in colour with longitudinal whitish-yellow stripes. No migrations were observed but it is certain that larvae move from wooded areas into fields and from one field to another when food is exhausted. When the larvae stopped feeding the site of prepupae and pupae could be located by circular holes where they had entered the soil. The same path was followed when the moths emerged.

The black army cutworm was easily controlled with a spray application of DDT, chlordane, aldrin, toxaphene or heptachlor at rates of from one to two pounds per acre.

Annual Statement of
THE ENTOMOLOGICAL SOCIETY OF ALBERTA
for the year ending December 31, 1953

Receipts

Membership fees:

1952 - from Can. Ent. Soc.	21.00		
1953 - for Alta. Ent. Soc.	62.00		
1954 - for Alta. Ent. Soc.	16.00		
1954 - special assessment	3.00		
1955 - for Alta. Ent. Soc.	<u>1.00</u>	103.00	
1953 - collected for Can. Ent. Soc. ..		<u>9.00</u>	112.00

Gift collection 7.00

Rebate on catering service 21.62

Bank interest66

141.28

Expenditures

1953 fees for Can. Ent. Soc. 9.00

Lawyer's fee re incorporation 13.00

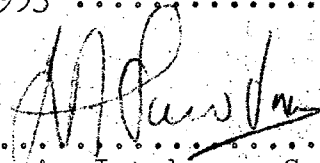
Stationery 46.10

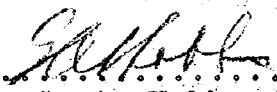
Farewell gifts to members 16.45

Covers for Proceedings 17.87

Postage82 103.24

Balance as at December 31, 1953 38.04


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L. A. Jacobson, Secretary


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G. A. Hobbs, Treasurer

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