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The Canadian Entomologist.

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LONDON, ONT., NOVEMBER, 1884.

No. 11

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Annual Meeting of the Society was held in London, at the Society's Rooms, Victoria Hall, on Wednesday, October 15th, 1884, at 7.30 o'clock, p. m.

The President, Mr. William Saunders, of London, Ont., in the chair.

Present : Mr. James Fletcher, Ottawa ; Rev. Thos. W. Fyles, Quebec ; Mr. J. Alston Moffat, Hamilton ; Mr. John M. Denton, London ; Mr. Wm. H. Harrington, Ottawa ; Dr. Burgess, Mr. A. Puddicombe, Mr. H. B. Bock, Dr. Wolverton, Mr. L. B. Reed, and Mr. Chas. Chapman, of London ; Mr. W. A. Macdonald, of the *Farmer's Advocate*, London, and the Sec.-Treas., Mr. E. Baynes Reed.

The minutes of the previous meeting were confirmed, the reading being dispensed with, as printed copies were in the hands of the members.

The President welcomed the members present, and expressed the regret they felt at the absence of some of those who in past years had attended the meetings, but were this year unavoidably absent, referring especially to Rev. C. J. S. Bethune, of Port Hope, and Mr. G. J. Bowles, of Montreal.

The Secretary presented the Report of the Council, embodying many of the results of the work of the Society for the past year, which will be published in the Annual Report.

The financial report of the Secretary-Treasurer was next read, showing a satisfactory condition of the funds. A report of the Librarian was also submitted, in which the additions to the library were enumerated, and a list given of the periodicals received in exchange for the CANADIAN ENTOMOLOGIST.

The report of the Montreal Branch of the Society was then presented, in which the work done by that energetic organization was referred to, presenting a gratifying exhibit highly creditable to the members comprising that branch.

Mr. Fletcher presented his report, read at the meeting of the Royal Society, as follows :—

REPORT OF THE DELEGATE OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO
TO THE ROYAL SOCIETY OF CANADA.

It affords me much pleasure, as delegate from one of the societies honored with an invitation to send a representative to the meetings of the Royal Society of Canada, to report that during the past year the work of the Entomological Society of Ontario has been vigorously prosecuted, on the same plan as that heretofore followed, with satisfactory and evident results. The monthly organ of the Society, the CANADIAN ENTOMOLOGIST, has been regularly issued, its pages having been entirely filled with original contributions from members of the Society on scientific and practical Entomology. The volume which closed with the year 1883, No. XV., consisted of 246 pages, and contained a number of papers on descriptive Entomology, embracing descriptions of no less than 4 new genera and 67 species of insects new to science ; also papers on practical Entomology, including life-histories of species, some of which have been minutely described in all their stages, and among them many injurious to agriculture.

With a view to popularize the science of Entomology, and to encourage beginners in the study, a special series of illustrated articles has been published, which we hope will have the effect of increasing the number of observers in this important branch of biology. To further this end, and to systematize the descriptive work being done in such a manner as to secure uniformity in this department of research, the Council have prepared forms containing instructions for describing insects in their different stages.

There has also appeared during the year in the CANADIAN ENTOMOLOGIST much valuable information in reference to the geographical distribution of North American insects.

For the benefit of those interested in agriculture and horticulture, the Annual Report, which is always devoted to this practical aspect of the study, has recently been published, covering 83 pages, and embracing the Report of the Council, the Treasurer's Statement, the President's Inaugural Address, in which a review is given not only of the work of the Society during the year, but also of most of the important events of interest to

entomologists in North America, as well as popular articles giving descriptions of and remedies for such insect foes as may have been found particularly injurious to our forest trees and field crops.

In addition to this, a circular is being now prepared for circulation among the farmers and agriculturists of the Province, requesting them to report as promptly as possible on any insects which they may find injuring their crops, with a view to the suggestion of appropriate remedies.

The membership of the Society still increases and now stands at about 400, and we have on our roll members who are working for us in every province in the Dominion, as well as many of the leading entomologists in the United States. We have, however, to deplore, with the whole scientific world, the loss by death during the past year of some of our most active members. Of these special mention may be made of Prof. Croft, the founder of our Society, and Dr. J. L. LeConte, the celebrated Coleopterist.

The large collections of the Society have been further added to and the library considerably augmented, their usefulness for purposes of reference and study thus being much increased.

At the request of the Dominion Government, the Society undertook the preparation of a collection of specimens designed to illustrate insects injurious and beneficial to fish, to be exhibited in the International Fisheries Exhibition held last year in England. This collection, consisting of 40 cases, was prepared and sent forward to London, where it formed a most useful and attractive feature of the Canadian exhibit, and its merits were recognized by the award of a silver medal.

The Council of the Entomological Society of Ontario are glad to learn that the suggestions contained in their report to your honorable Society last year, with regard to increased facilities for the transmission of natural history specimens by mail, are, in response to a petition from the naturalists and students of science in Canada, receiving favorable consideration from the Hon. the Postmaster General, and they trust that the Royal Society of Canada will continue to use its influence in this direction on behalf of the students of natural history.

JAMES FLETCHER,, Delegate.

The President then delivered his annual address, as follows :—

ANNUAL ADDRESS OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY
OF ONTARIO.

Gentlemen : The working entomologist, ever on the watch and ready to note the many items of interest in connection with insect life, will seldom pass a season without finding many facts worthy of record, which if not of general interest, are at least of local importance. While the year 1884 has not been marked by any unusual invasion of destructive insects, affecting our country as a whole and exciting general comment, yet many localities have suffered, either from the unusual development of familiar forms of insect life, or from the introduction of new pests.

Early in the year some excitement was caused in the Ottawa district by the appearance of a very destructive caterpillar in great numbers in the clover fields, which rapidly devoured the foliage. This was at first supposed to be an invasion of the veritable army worm, but on inspection it proved to be a very different insect. On the 23rd of May I had the opportunity of examining some of the affected fields in company with our Vice-President and Mr. W. H. Harrington. The caterpillars were exceedingly numerous, and much of the clover had been seriously injured by them. They were a species of cut-worm, the progeny of a moth known as *Agrotis fennica*.

This larva measured from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in length, had a dark yellowish brown head with a black stripe down the front, and a black body with two yellow stripes on each side, the upper one composed of streaks and dots of yellow, the lower, which was near the under surface, formed of two crinkled yellow lines which approached each other on the anterior segments and diverged posteriorly. On the upper part of the second segment was a black horny shield; the breathing holes on the sides were also surrounded with black.

The underside was brownish black, the feet and the fleshy pro-legs pale brown.

At the time of this visit the caterpillars were nearly full grown, and it was observed that many of them were affected by a singular disease of a fungoid character which was destroying them very rapidly, the diseased insects after death remaining extended on the leaves of clover or blades of grass in a natural position, but somewhat discolored. On handling them the skin was found to be quite tender and the body filled with a thin, dark-colored fluid, the result of the decomposition of the tissues. This

disease spread very rapidly, and was no doubt contagious. I collected some fifty or sixty specimens, all apparently in a healthy condition, for the purpose of rearing them. These were placed in two separate boxes with a liberal supply of food. Within twenty-four hours a large number of them died, all apparently from this disease; they were frequently examined, the diseased and dead were separated from the living, but within three days only four remained alive; of these four only one survived to enter the chrysalis state, and this one did not mature the perfect insect, hence I am indebted to Mr. James Fletcher for the determination of the insect, who, being on the spot, succeeded in rearing several specimens of the moth.

A few days later complaints were made to me of the depredations of the caterpillar of another of our cut-worms, a species usually very common, the larva of a moth known to entomologists as *Hadena arctica*, which was very destructive to corn and other crops. A few days sufficed to mature the swarms of both these devastating armies, when those caterpillars which had escaped both disease and enemies buried themselves in the ground and changed to chrysalids, which subsequently produced the winged moth.

Every season these cut-worms are a source of great annoyance to gardeners and farmers, who find their young corn, cabbages, tomatoes, melons and other plants of succulent growth suddenly cut down by an unseen enemy and withered. Stalks of wheat and other grain are often cut in a similar manner by the same enemies, and they being universally distributed and extremely voracious, inflict enormous losses every year. They have received the name of cut-worms from their habit of cutting off near the base tender and succulent plants, and under this common designation there are included a number of species having similar habits, belonging chiefly to the genera *Agrotis*, *Hadena* and *Mamestra*, some of which possess striking points of difference in the moth state, although they much resemble each other while in the caterpillar condition. The general history of these cut-worms can be given in a few words. The eggs are laid by the parent moths during the latter part of the summer, sometimes on the ground about the roots of grass and other plants, and sometimes on the leaves near the ground. Within two or three weeks young larvæ hatch from these eggs, and by the time autumn sets in the caterpillars have attained the length of half an inch or more, when they burrow into the ground deep enough to protect them from injury by

severe frost, and there remain in a torpid condition all the winter. The warmth of spring arouses them to activity, when they seek the surface of the ground, feeding at night on almost any green thing they meet with, eating with almost insatiable appetites as they approach maturity, and burying themselves during the day under the surface of the ground in the neighborhood of their depredations. When full grown they burrow in the earth to varying depths, and there change to chrysalids from which the mature insects escape in two or three weeks.

These insects are hurtful only while in the larval condition. As remedies, showering the plants with Paris green and water, sprinkling them with air-slacked lime or powdered hellebore, or strewing lime or soot, or mixtures of these substances around the plants on the surface of the ground, have all been recommended, and in some cases have been found useful. Plants have also been protected from injury by these caterpillars by strewing around them a little dry sand impregnated with coal oil, in the proportion of a teacupful of coal oil to a pailful of sand, thoroughly mixed; the application should be renewed every week. This method of warding off the attacks of injurious insects by the use of odorous substances repugnant to them, is rapidly growing in favor on account of the success attending its use. This coal oil remedy for cut-worms is said to be very effectual, and the cost of the application being so trifling, its usefulness should be extensively tested. It is manifest that none of these measures are feasible where field crops are invaded, as the area would be too great for any one to undertake to cover with such material. In such cases nature has provided efficient remedies to reduce the numbers of such injurious species. Besides the disease to which I have referred, there are armies of parasitic insects which prey on them. Some of these directly devour their living prey, others deposit eggs within the bodies of their victims, which hatching into grubs, consume them. Hence it often occurs that an insect which is very abundant one season is scarce the next.

These cut-worms are very widely disseminated. Early in July I received specimens from Manitoba from the Deputy Minister of Agriculture, of a caterpillar belonging to this group, which was found to be seriously injuring vegetables, and in some localities oats and barley also. This was a grayish-brown caterpillar with a semi-transparent skin, a brown horny head and a shield of the same character on the upper part of the second segment. There was a pale line down the back, two similar lines along each side, and a white band lower down, close to the under surface.

One of them was reared through all its stages, and produced a neat and rather pretty moth, known to entomologists as *Agrotis declarata*.

That destructive pest, the wheat midge, *Cecidomyia destructor*, which has entailed so much loss on our farmers in years gone by, has prevailed during the past season to a considerable extent throughout the western part of our Province. Alarming reports were sent to me from various districts, and on the 16th of July a tour of inspection was undertaken for the purpose of ascertaining the extent of the injury. During a drive of over 100 miles, in company with Mr. J. M. Denton, one of the members of our Council, the wheat fields were examined and midge was found generally distributed, but nowhere in any very great numbers. Some varieties of wheat were much more injured than others; that known under the names of Michigan Amber and Egyptian seemed to suffer much. Among the varieties almost free from this trouble the Democrat wheat was one of the most esteemed. The selection of some of the best of the so-called midge proof varieties for seed, the kernels of which harden so early in the season that the larva is unable to feed on them, is assuredly one of the most practicable methods of lessening the depredations of this troublesome insect.

The Colorado potato beetle, *Doryphora decemlineata*, is still further extending its ravages. Having reached the Atlantic seaboard in the east, its further progress in that direction has been arrested; it is now extending its domain over the fertile fields of the North-west. Specimens have been sent to me this season from Portage-la-Prairie, where they are said to be confined to the neighborhood of the town, and having been rigorously assailed with Paris green, it is hoped that they have been pretty well exterminated. Through the kindness of Acton Burrows, Esq., the efficient Deputy Minister of Agriculture in Manitoba, I have received information of the appearance of this pest in the counties of Manchester and Dufferin, in the same Province, but in none of these localities has the insect yet made much headway.

Grape growers in some sections of Ontario suffered much early in the season from injuries caused by the grape-vine flea-beetle, *Graptodera chalybea*. This insect, which is about three-twentieths of an inch long and varies in color from a steel blue to green, passes the winter in the perfect state, hibernating under dead leaves and other rubbish, and awaking from its long slumber in early spring, proceeds to satisfy its vigorous

appetite by consuming the tender buds of the grape-vine, just as they are swelling. These insects have been so plentiful in some vineyards that the crop has been almost destroyed. Where they prove troublesome they may be collected by spreading sheets on the ground under the vines and jarring the canes early in the morning when the beetles are in a torpid condition, or they may be poisoned by syringing the swelling buds with Paris green and water.

The plum curculio, *Conotrachelus nenuphar*, continues its mischievous work in most parts of the Province where plums are grown, and the labor attending the jarring of the trees for the purpose of capturing and killing the insects deters many from undertaking the cultivation of this useful fruit. From the evidence thus far obtained it would appear that the remedy which has been found so efficacious in subduing the codling moth of the apple, namely, Paris green and water in the proportion of a teaspoonful of the poison to a pailful of water, will also protect the plum crop from the ravages of curculio. This remedy should be extensively tried by thoroughly syringing the trees with it as soon as the fruit has set, and repeating the application in a few days should rain occur to wash it off. Should this remedy prove uniformly successful a great stimulus will be given to plum culture. During the past season the plum crop on my own grounds was a failure, the trees having had but very few blossoms. In the absence of plums the curculios deposited their eggs freely on the pears, manifesting a special fondness for Clapp's Favorite. Although I watched them carefully, I failed to find a single example where the insect matured in this fruit. The only effect observed was a slight disfigurement in the form of the fruit and the production of a hard spot where the incision was made. While collecting moths at sugar early in the season, I observed one evening about nine o'clock, among the insects which came to sip the sweets, two specimens of the plum curculio. I captured one of them, the other fell to the ground before I could secure it. Experiments made by me some years ago proved that this insect is active at night as well as in daylight, but this is the only instance I have known of its being attracted to sugar at night.

From one locality complaints reached me about the middle of June last of the abundance of a spiny caterpillar feeding on currant bushes, which my correspondent supposed to be a new currant worm. Specimens were forwarded and proved to be the caterpillar of the gray Comma butterfly, *Grapta prognæ*. This insect may be found almost every season in

limited numbers on the wild gooseberry and currant bushes in open woods, and occasionally on the cultivated varieties, but this is the first instance to my knowledge where the insect has appeared in sufficient numbers to cause injury. They are so very subject to parasites that it is not at all likely they will ever prove generally destructive; syringing the bushes with Paris green and water, or dusting the foliage with powdered hellebore, will soon make an end of them.

In the neighborhood of Drummondville several acres of red raspberries were stripped of their foliage by the larva of the raspberry sawfly, *Selandria rubi*; reports of injury from this pest have also been received from several other localities. It is a green worm which is so exactly of the color of the young foliage it feeds on that it frequently escapes detection. When examined this larva is found to much resemble that well known pest, the currant worm, but it has no black dots. If allowed to pursue their course they soon riddle the leaves, leaving little more than a net-work of the coarser veins. An application of hellebore mixed with water, in the proportion of an ounce of the powder to a pailful of water, speedily destroys them.

A new clover insect has recently invaded our Province which promises to be troublesome. It is a small curculio known to entomologists as the punctured clover-leaf weevil, *Phytonomus punctatus*. It is said to have been introduced from Europe within the past few years. The late Dr. LeConte, in a work published in 1876, reports having received one specimen from Canada, but at that time nothing seemed to have been known of its habits. In 1881 Prof. Riley published in the *American Naturalist*, an account of the injury done to clover fields in Yates county, New York, by this insect; in one instance in a patch of two acres scarcely a whole leaf remained. The beetle is about two-fifths of an inch long, of a dark brown color, marked with dull yellow, and has its wing cases thickly punctured. Each female is said to deposit from 200 to 300 eggs, which are sometimes laid on the surface of the leaf stem, but more frequently thrust into the interior of the older stems. The young larvæ may be found as early as in May, but being small they do not usually attract notice until almost a month later. At first they feed among the folded young leaves or attached to the under side of a leaf. When approaching full growth they feed chiefly on the margins of the leaves, into which they eat irregular holes. At this period they are not easily seen, as they relax their hold and drop suddenly to the ground when approached; moreover, they feed

chiefly during the night and hide in the day time among the roots and stalks of the plants. When full grown the larva spins a small cocoon, which is usually placed a little below the surface of the ground, in which it changes to a chrysalis; about three weeks later the beetle escapes. From observations which have been made on this insect at the Department of Agriculture, in Washington, the average period required from the time of the depositing of the egg to the escape of the mature beetle is three and one-third months, hence in most localities there will be two broods during the summer. Mr. A. H. Kilman, one of our members residing in Ridgeway, was the first to report the occurrence of this pest in Ontario, which he says was wafted to our shores by prevailing east winds, about the 10th of August last. On this date the beetles appeared on the opposite side of Lake Erie, in Buffalo, in such multitudes that thousands of them were crushed on the pavements by the feet of passers by. Mr. Kilman says: "I picked them from the fences and sidewalks, and found them in the grass in my lawn; I am of opinion that they will go into winter quarters here and open up a lively campaign in the spring. Whatever the sequel may show, I fear these invaders will prove of better staying qualities than those who crossed the border in '66, and turned to the right about at Ridgeway because Canada was not the 'clover patch' they were looking for."

As the larvæ will be found most numerous in the latter part of May or early in June, it is recommended that the clover should be heavily rolled at that time for the purpose of destroying them. If badly infested fields were ploughed about this period, the destruction of the insects would be still more certain.

Early in the summer alarming accounts were received of another insect injuring the maple trees, especially the shade trees on streets and avenues. This was a species of Coccus or bark-louse, *Pulvinaria innumerabilis*, which forms brown scales on the branches, from under one end of which there protrudes a cotton-like substance, forming a tuft about four times as large as the scale in which the eggs of the insect are lodged. In a short time there issues from this egg-nest a multitude of minute yellowish white lice which distribute themselves over the branches, and locating on the succulent portions, pierce the tender bark with their sharp beaks and subsist upon the sap. These young lice soon become stationary, gradually increase in size

and reach maturity towards the end of the season. They chiefly affect the underside of the limbs and branches.

Remedies.—The branches may be rubbed with a stiff brush or broom, which will dislodge many of the insects, and then washed with a liquid made of soap diluted with lye or solution of washing soda, or with an emulsion of coal oil made as follows: Take one pint of coal oil and agitate vigorously with an equal quantity of milk until the compound assumes a creamy appearance, when it should be diluted with about ten times its bulk of water and applied with a brush or syringe.

This pest has occurred in many localities in Western Ontario, also in Michigan, New York and Pennsylvania.

That cosmopolitan butterfly known as the painted lady, *Pyrameis cardui*, has been very abundant the past summer, not only in Canada, but also in most of the Northern United States. From Mr. Burrows I learn that in Manitoba the larvæ appeared in such countless hosts as to cause much alarm, and reports were current of their having injured some of the growing crops. This, however, is improbable, as it devotes its attention mainly to devouring thistles. Occasionally specimens have been found feeding on mallow, hollyhock, wild sunflower, burdock, and several other plants, none of which, however, are of any economic value.

A lively interest is being awakened in reference to the insects inhabiting our Northwest Territories and British Columbia, of which we as yet know comparatively little. Captain Gamble Geddes, of Toronto, has made excursions to several of these distant points and brought home many rarities. From the Moose Mountain district in the Province of Assinaboia, a number of interesting specimens have been received, collected by Miss F. M. Pierce. Prof. Panton, of Winnipeg, has been collecting in that neighborhood, and in British Columbia we have a most efficient helper in the person of Mr. G. W. Taylor, who has recently published in the CANADIAN ENTOMOLOGIST, lists of some of his captures in the neighborhood of Victoria. It is sincerely hoped that other observers will be induced to labor in these most interesting and promising fields.

On the 30th of January last, the House of Commons at Ottawa resolved to appoint a select committee to inquire into the best means of encouraging and developing the agricultural industries of Canada. Circulars were prepared by the committee embracing a series of questions which were sent to most of the prominent agriculturists and scientific men in the Dominion, to which several hundred replies were received. The

practical bearing of entomology on agriculture was fully recognised by the committee, and the questions so framed that a very large amount of information on this subject was gathered. Our Vice-President, Mr. James Fletcher, was summoned to give evidence in reference to injurious and friendly insects; so also was Mr. W. H. Harrington. A report has been issued covering 218 pages, containing the evidence and a summary of the replies to the questions. It is gratifying to find that the close relationship between entomology and successful agriculture is beginning to be more fully realized, and that the work of our Society and the efforts of entomologists generally are so well spoken of as they are in this document.

Continued efforts are being made by our Society to obtain and disseminate correct information, especially in reference to those insects injurious to agriculture. With this in view we have lately issued a number of blank forms for describing insects, which will be sent to any one desiring them on application to either of the officers in London. By this means we hope to secure fuller details and more uniform descriptions of insect pests, so that they may be more readily determined. The officers and members of the Council have also embraced every opportunity afforded them of visiting localities affected by destructive insects, and have endeavored to disseminate among the sufferers practical information in regard to the most effective remedies for such evils. The demand for our Annual Reports from all parts of the world has much increased since the publication last year of the general index. It is a matter of regret that the issue of several of the earlier reports is entirely exhausted, and there is now no means of supplying the demand. Our monthly journal, now in the sixteenth year of its existence, continues also to grow in public favor.

During the past year reports of great value in reference to destructive insects have been published by the Department of Agriculture, at Washington, under the able direction of Prof. C. V. Riley. A most excellent and voluminous report from the pen of Prof. J. A. Lintner, State Entomologist, has been printed and distributed by the State of New York. Much useful work has also been accomplished in the same direction by Prof. A. S. Forbes, State Entomologist of Illinois; by Prof. Herbert Osborn, of the Iowa Agricultural College, and others. Many additional parts have appeared of that superbly illustrated work on North American Butterflies, by Mr. W. H. Edwards; the same talented author has also now in the press a revised catalogue of the butterflies of North America. The recent meeting of the Entomological Club of the American Associa-

tion for the Advancement of Science, held in Philadelphia, was one of unusual interest, most of the leading entomologists on this continent being present. A full report of the proceedings has been prepared.

In concluding, permit me to urge upon you all renewed diligence in your studies of insect life ; be patient and faithful in observing, be prompt in publishing the results of your observations. The field we labor in is so vast that life is too short to permit any one of us to do much, especially when the limited time is taxed by other pressing engagements. Nevertheless, let us do what we can to unravel the mysteries relating to these much-despised atoms of existence ; the opportunity is ever before us,

"Ten thousand forms, ten thousand different tribes,
People the blaze of day."

And when the brightness of the sunshine has faded, there are tribes equally numerous and attractive which rise not from their couch until their more obtrusive brethren have retired to rest. Whether it is ours to employ portions of the night or the day in this charming occupation, we shall not in either case fail to find manifested in beauty of form and in the instincts with which these tiny creatures are endowed manifold evidence of the wisdom and goodness of the great Author of Life.

ELECTION OF OFFICERS.

The following named gentlemen were then duly elected as officers of the Society for the ensuing year :

President, William Saunders, London, Ont.

Vice-President, James Fletcher, Ottawa, Ont.

Secretary-Treasurer and Librarian, E. Baynes Reed, London, Ont.

Council: Rev. C. J. S. Bethune, M. A., Port Hope ; Rev. J. W. Fyles, South Quebec ; W. H. Harrington, Ottawa ; J. M. Denton, London ; J. Alston Moffat, Hamilton.

Editor "Canadian Entomologist," William Saunders, London.

Editing Committee, Rev. C. J. S. Bethune, J. M. Denton, James Fletcher, and E. Baynes Reed.

Auditors, W. E. Saunders, H. P. Beck.

Delegate to "Royal Society," W. H. Harrington.

DISCUSSION.

On motion of Mr. James Fletcher, seconded by Rev. J. W. Fyles, a vote of thanks was unanimously tendered to the President, Mr. Wm. Saunders, for his able and interesting address.

In proposing this vote, Mr. Fletcher said that he should like to make a few remarks concerning some of the subjects alluded to in the address, particularly with regard to the cut-worms referred to in the earlier part, which he had especially investigated by instruction of the President, and upon the occurrence of which he had prepared a short note for the Society. He stated that the injury done by *Agrotis fennica* at Ottawa, in the month of May last, was very great. He had received reports of its ravages early in the month, and in all cases those inquiring for remedies stated that the insects were new to them. The first specimens sent were taken in large numbers under strawberry plants, and were about half an inch in length. After a few days reports came in *from all quarters, of their devastation*, which was worst about the 22nd May, when, the President being in Ottawa, he had, together with Mr. Harrington and himself, visited one of the most seriously injured farms two miles from Ottawa, where they had found the larvæ in vast numbers attacking the clover in a field of fodder, but leaving untouched the rye which was growing with it. At first it was supposed by the farmers that the insect was the Army Worm, but the larva upon examination was found to be quite different, being of a deep velvety black with indistinct white lines. It was found to be chiefly nocturnal in its habits, and to possess characteristics of the ordinary cut-worms, lying hid beneath the surface during the day, and destroying everything within its reach at night. They were also climbing cut-worms, and had done much damage by eating out the leading shoots in some young trees Mr. Fletcher was growing from the seed for examination; oak, black walnut, horse chestnut, elm, negundo and maple, all had suffered. It seemed that during the last stage the larvæ were much more active during the day time, and did not hide under the surface. Just before the pupal stage an enormous fatality was caused by a fungus disease which attacked the larvæ and which caused them to decay very rapidly. In certain fields they could be seen in large numbers on the stems of grass and other plants which they had crawled up, and to which they were fixed by the fungus which seemed in nearly all cases to develop just below the head in the shape of a small tuft of white downy matter; after a short time the bodies dried up. Large numbers had also fallen a prey to parasites, and as many as three ovæ of a *Tachnia* fly had been found on some specimens. Mr. Fletcher had only succeeded in rearing about a dozen imagines, nor had the moth been very common during the summer, although a few had been taken.

With reference to the Manitoba cut-worm, referred to by Mr. Saunders, he had succeeded in bringing to chrysalis three of the four larvæ sent to him by Mr. Acton Burrows, the Deputy Minister of Agriculture for Manitoba; of these when the moth emerged one proved to be *Agrotis devastator*, and the other two had been sent to Mr. J. B. Smyth, of New York, for identification. They were very dissimilar in color, but the markings seemed to be the same on each.

Mr. Fletcher also stated that during the month of July he had found a small *Phytonomus* committing great damage in the clover at Dalhousie, New Brunswick.

He had taken it for *P. nigrirostris* at first, but fancied it might be a different species, as nearly all the specimens bred were light cinnamon brown in color*.

He found that its habits differed considerably from those of *P. punctatus* as described in Prof. Lintner's first report. He had brought specimens for the members, and as he had prepared a note of the insect for the Society he would not say more then. He had found a cocoon on clover at Brome, in the Eastern Townships.

Mr. J. Alston Moffat here exhibited specimens of the true *P. punctatus* which he had received from Mr. Kilman, Ridgeway. Resuming his remarks, Mr. Fletcher said that he had observed enormous damage done by the Larch saw fly, *Nematus Erichsonii*; he had first noticed it near Quebec, and had traced it all down the Intercolonial Railway, wherever any Larch trees occurred, as far as Dalhousie, where he found it abundant. He exhibited interesting specimens of young twigs of *Larix Americana* which he had received the previous week from the Rev. Mr. Fyles, from Quebec, in which the leaves of the tree, although eaten down to the base by the larvæ, had later in the season, after the attack ceased, been able to grow about a quarter of an inch. Mr. Fletcher thought that this fact, that the tree was able to produce this after-crop of foliage, was one of very great importance, as the tree might by this means be able to withstand the insect for a much longer period; he anticipated that some remedy, either artificial or natural, would be found before long.

He exhibited a small Homopteron, *Podisus modestus*, which he had found destroying the larvæ at Brome, P. Q., on the estate of S. A. Fisher,

* Since identified as *Phytonomus nigrirostris*.

Esq., M. P., who had given him assistance, and provided him with facilities for examining this pest.

The Rev. T. W. Fyles, of South Quebec, said it afforded him much pleasure to second the vote of thanks to their President. Referring to the fungous disease upon the cut-worms mentioned by Mr. Fletcher, he said that he had known in England many years ago of an insect similar to this being attacked by some such disease as had been described. He spoke of the habits of cut-worms, saying that as they did not tunnel their way from plant to plant, but passed over the surface, a circle of salt placed round each plant at a short distance would probably save it; the larvæ would shun the salt. Besides this there was the remedy of "hilling up" the plant; he had found that the larvæ would not climb a mound on account of the particles of earth giving way. He believed that salt in the early stages of the plants and the mounds of earth afterwards, would amply protect corn, etc., from the attacks of the insects.

He next spoke of the potato beetle, *D. decem-lineata*, and expressed his belief that its numbers and vigor were decreasing in the Province of Quebec. He stated that there were places on the Lower St. Lawrence where it had not appeared.

He next remarked that *Nematus Erichsonii*, the Larch saw-fly, had extended its ravages along the Beauce Valley to the neighborhood of Quebec, where it had stripped the tamaracks (larch) bare. A second growth of leaves had appeared, and this probably would save the trees. If, however, the attacks were repeated to the same extent, he believed the trees would die. Mr. Fyles showed specimens of the insect and of its cocoons.

Mr. J. Alston Moffat, of Hamilton, stated that he had lately received from his friend, Mr. J. B. Hay, of Brantford, some specimens of a beetle that had been found attacking hot-house plants, *Abutilon*, *Roscs*, *Plumbago*, etc. The insect being new to him he sent it to Dr. Horn for identification, and received the follow letter from him:—

Philadelphia, Pa., Oct. 10th, 1884.

Dear Sir: The insect you send is *Aramiges Fulleri* Horn. (Fuller's rose beetle). It is widely scattered over the country, and has been reported to me as damaging many hot-house plants, particularly the thick leaved varieties. It seems a great nuisance, and eight years ago appeared to be rare.

G. H. HORN.

Specimens of this insect were exhibited by Mr. Moffat.

The President, in referring to the work of the special committee appointed by the House of Commons in February last to inquire into the condition of agriculture, said that the members would be much pleased to learn that as one of the results of that inquiry, Mr. Fletcher had been appointed Honorary Entomologist to the Dominion Department of Agriculture. It was much to be desired that this appointment should become permanent, for the Society cordially recognized the special fitness of Mr. Fletcher for this important position, and believed that he would accomplish much good work in this connection.

Mr. Reed exhibited a colored photograph presented to the Society by Mr. Alfred Wailly, an English member of the Society, representing an extraordinary aberrant form of *Attacus cecropia*.

Mr. Fletcher stated that he was happy to announce that during the past summer, under instructions from Dr. Selwyn, F. R. S., Director of the Geological Survey of Canada, an interesting collection of Lepidoptera had been made in the Lake Nepigon region by Prof. Macoun and Mr. William Macoun, and that these having been submitted to him for identification, he had found many very valuable insects, included among which he made special mention of two species of *Chionobas*, *Colias eurytheme*, *Colias interior*, a species of *Chrysophanus*, which was possibly new, and *Alypia MacCullochii*. By means of these instructions to the surveyors it was hoped that much useful information would be obtained of the insect fauna of these newer parts of the Dominion that were being explored and opened up for occupation.

Mr. Fletcher remarked that we have heard a good deal of rubbish in the newspapers, etc., about nothing being done by the members of the Geological Survey. He hoped that it was unnecessary to say that these reports were entirely without foundation, and, at any rate, the present action of the Director would prove to all entomologists that he appreciated the value of their scientific researches.

The evening being somewhat advanced the Society adjourned until 9 o'clock next morning.

Thursday Morning, October 16.

The Society re-assembled at their rooms at 9.30. The President in the chair.

Mr. W. H. Harrington stated that *Phytonomus nigricornis* occurred in considerable numbers in the vicinity of Ottawa, but that he had not

found any evidences of the destructive habits described by Mr. Fletcher. It was, however, known to attack clover in Europe.

He mentioned several insects found by him on Larch, such as *Urocerus flavicornis* and *Buprestis maculiventris*. During the previous summer he had, in company with Mr. Fletcher, noticed a grove of tamarac with trees in various stages of health and decay, and the cause of the latter seemed undoubtedly to be a species of *Dendroctonus*, which was found in immense numbers under the bark of sickly and dying trees. The bark was completely undermined and riddled by its galleries, and swarmed with larvæ pupæ and beetles. Associated with them were large numbers of a smaller bark-borer, *Hylesinus opaculus*, with one or two other species, which would not be likely, from their habits or numbers, to do much injury. Examination of dead trees showed that the bark had been destroyed in the same manner, but now contained no beetles.

In reply to a question as to whether such bark beetles ever attacked living and healthy trees, Mr. Harrington answered in the affirmative, and instanced a species which he had during the spring found boring into and through the terminal buds of *Pinus strobus* (white pine) and thus destroying them.

EXHIBITION OF INSECTS.

Mr. Harrington exhibited a small collection of about 50 species of Coleoptera taken by him at Sydney, Cape Breton, during a visit of a few days in September, also specimens of the Chinch bug which he had found abundant there; he also exhibited a *Chalcophora liberta*, with deformed thorax, a *Trogosita mauritanica*, with deformed head, and a wasp (*Vespa*?) with one of its antennæ curiously deformed.

Rev. T. W. Fyles showed specimens of *Colias eurytheme*, *Pieris Manitoba*, *P. centaureæ*, a female of *Smerinthus terysii*, and other rare insects.

Mr. J. Alston Moffat showed a collection of rare and interesting insects, both Lepidoptera and Coleoptera.

Mr. Fletcher exhibited a collection of 40 specimens of *Colias philodice*, showing many curious varieties. Two specimens of *Colias eurytheme*, one of which was the autumn form bred from the egg. Two specimens of a small moth bred from larvæ found boring in the flowers and capsules of *Nelumbium luteum* at Chicago. A specimen of *Sphinx luscitiosa*. A *Hepialus* taken at Dalhousie, N. B., very similar to *H.*

argenteo-maculata, but smaller, and having 4 spots on the primaries. Two specimens of a *Chrysophanus*, taken by Mr. A. Macoun, at Nepigon. Specimens of *Agrotis fennica*, and other rare Lepidoptera taken during the past season.

Rev. T. W. Fyles exhibited specimens of mud wasps' nests, taken at Compton, from which he had obtained grubs that produced a species of Ptinidæ.

Mr. J. M. Denton showed some Philadelphia raspberry canes which were badly injured by some borer not determined.

The President exhibited two boxes of insects which had been lately received from Miss F. M. Pierce, of Moose Mountain, Assinaboia, who had sent the specimens as a first collection. The boxes proved of great interest to the members present.

The Secretary exhibited the beautiful silver medal which had been awarded to the Society by the International Fisheries Exhibition. The medal was much admired.

In presenting a collection of diurnal Lepidoptera from Mr. S. W. Taylor, of Victoria, Vancouver Island, Mr. Fletcher stated that he considered one of the chief advantages of having the annual meeting at London was that the members could see in what species the Society's reference collection was deficient, and he was sure that they all felt the necessity of making the collection as complete as possible. For his own part, he would much prefer giving any unique specimens he might take to the Society, rather than have them hidden away in his own collection where only a few could see them. He had now very much pleasure in presenting a small but valuable collection of specimens to the Society from his friend, Mr. S. W. Taylor, of Victoria, B. C. Mr. Taylor, although one of our new members, had already done good work. Mr. Fletcher also distributed among the members a packet of duplicates, sent for that purpose by Mr. Taylor, among which were specimens of a *Melitæa* provisionally named *rubicunda*, but which were not considered typical by Mr. W. H. Edwards; of this species, however, Mr. Fletcher had received larvæ, some of which were in his own hands, and some had been forwarded to Mr. W. H. Edwards.

The President expressed the pleasure Mr. Taylor's liberality had given him and the gratification he felt that the Society's collections were so much appreciated; a vote of thanks was given to Mr. Taylor for his donation.

Mr. Harrington stated that *Oberea tripunctata* had been found very abundant at Ottawa. He remembered it also as being general in 1873.

Mr. Reed called attention to an extract from a newspaper showing that railroad cars may often be the vehicles of carrying destructive moths from one part of the country to another. The extract stated that the writer was often struck by the number of "*Aletia*" on the trains, and that he had observed that there was a sort of coincidence last season between lines of railroad and abundance of cotton worms.

Mr. Reed said that he had noticed fewer specimens of *Aletia* this year than for some seasons past, although a few had within a few days been caught in his residence.

Mr. Reed also said that *Aegeria acerni* had been very prevalent in the neighborhood of London this season.

Rev. Mr. Fyles reported that *Aegeria tricincta* had been taken at Como, P. Q., and also that he had taken two larvæ of *P. satellitia*.

Mr. Fletcher showed an aberrant specimen of *Notodonta americana* that had emerged from basswood in autumn instead of spring; he also reported the capture at Ottawa of *Ellema Harrisii*.

An interesting discussion then took place on the transmission of insects through the mail, and the best method of relaxing specimens.

In answer to Rev. Mr. Fyles, Mr. Fletcher said that we had not in Canada any plant which could be used as a substitute for the Laurel so extensively used by European entomologists, not only for killing the insects, but for keeping them for a long time in a relaxed condition without spoiling. He had tried the young leaves of some of the different species of wild cherry, which contain prussic acid; but had found that although it killed the insects, it soon became mouldy.

Mr. Reed had found moist sand an excellent means of relaxing Lepidoptera, and boiling water for Coleoptera.

The meeting finally passed a resolution requesting Mr. J. Fletcher to prepare for the use of the members a short circular giving instructions for relaxing specimens, and also the best plan of packing them for transmission through the mail.

This Mr. Fletcher undertook to do, remarking that he himself had found the process of nature-printing a very useful mode of sending Lepidoptera for identification.

(To be Continued.)