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# The Canadian Entomologist.

VOL. II. TORONTO, SEPT. & OCT., 1870. Nos. 10 & 11.

## TO OUR SUBSCRIBERS.

During the last few months the Editor and his valued contributors, Messrs. W. Saunders and E. Baynes Reed, have had the little leisure they are wont to devote to Entomology, so completely engrossed with the preparation of a Report on some of the Noxious Insects of Canada, for the Agricultural and Arts, and the Fruit Grower's Associations of Ontario, that it has been quite out of their power to issue a number of the *Canadian Entomologist*. In order to make some amends for this delay, we now issue a double number, and hope—we no longer venture to promise—to publish the closing number of the volume in a few weeks. We shall be glad to receive contributions from our friends in all quarters, and to obtain promises of aid for our *third* volume.

## EXTRACT FROM A REPORT ON THE PLUM CURCULIO,

(*Conotrachelus nenuphar*)

BY W. SAUNDERS, LONDON, ONT.

Read before the Meeting of the Fruit Growers Association of Ontario, held in London, June, 1870.

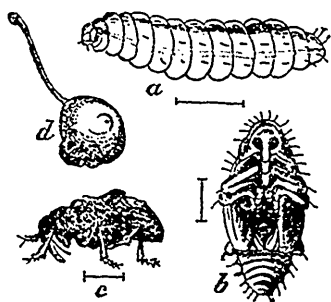


FIG. 3.

The accompanying figure shows the curculio in all its stages. *a*, is the larva, *b*, the chrysalis, *c*, the perfect beetle, all magnified, the adjoining lines show the natural size, *d*, is a small plum with the curculio (natural size) working on it. One egg is deposited under the crescent cut, and a second incision is being made.

I shall now refer to some experiments of my own on this insect which will, I hope, add something to our knowledge of the creature's habits. I had seen it stated somewhere that the curculio was

active at night, and I had also seen the idea ridiculed, and being somewhat sceptical on the point, resolved to test it. Accordingly I went out about midnight with lantern and sheet, and on jarring one tree down came two curculios, and from another tree one. When they drop to the ground from jarring in the day-time they usually remain motionless for a good while, feigning death. But there was no shamming about these creatures taken at this time of night, for they commenced to run about at once on the sheet, and fearing they would fly they were quickly transferred to a pill box. They were then taken into a room where there was a lamp burning, when on opening the box one of them at once took wing attracted by the lamp, and flew around the light. Thinking this activity might be due in part to the stimulus of a bright light, I placed them in a dark room for a while, and then approached them with the faintest glimmer of light, just enough to enable me to see them, when I observed them running about very quickly, faster than I have seen them move in bright daylight. This ended the experiments for that time, and the insects were closely shut up in a box for safety.

The next night the operation was repeated, and two curculios taken from one tree as before. These manifested just the same symptoms of activity as their predecessors, and along with them (now five in all) they were put into a box having a glass lid, with a small branch from a plum tree having five plums on it, each one of which had been carefully examined and found quite free from puncture or bite of any sort. The box was placed in a darkened room and covered with a black cloth so arranged that no light could possibly penetrate until its removal. Early in the morning the cloth was suddenly taken away and two of the curculios were found working on the plums, while the others were quiet or leisurely walking around in other parts of the box. The branch was at once taken out and examined: plum No. 1 had a puncture at the tip, hollowed out so that the skin was getting black; No. 2 was in the same state with a second large puncture in the side; No. 3 had two punctures on the tip, one large and one small one; No. 4, a small puncture near the base of the stem, while in No. 5 four eggs were deposited, and it was also punctured in four places, one of the punctures being very large, deep, and crescent shaped, a second quite shallow, barely through the skin. I observed that they were much less active in the morning than at night.

Being anxious to see how they would do their work in the day-time, another branch was cut with sound plums on it a little before noon and placed in the box with the same insects. When exposed to the sunlight they were nearly as active as in the night, occasionally flying around the box inside. They were left exposed under a slight shade afforded by a small tree

and examined at noon, when it was found that two eggs had been deposited, this was within an hour from the time of their exposure. Again it was examined early in the evening, when the number of eggs deposited had increased to nine, and a great many punctures had been made on different parts of the fruit where the curculios had been feeding.

These experiments I think clearly prove that they work in the dark as well as in the light, feeding and depositing eggs at night as well as in the daytime—that is during the warmer parts of the season, for it should be observed that at the time I operated the nights were quite warm.

With regard to the best time for jarring, experience leads me to believe that the evening is preferable, provided the work is not undertaken too early, say above sunset, or if it is done in the morning the earlier the better. I will give you a little incident connected with evening jarring. Having just observed a curculio drop on the sheet where I was at work, and having a few minutes to spare I resolved to watch to see how long the creature would feign death. For half an hour a careful scrutiny was kept up, during which time it did not move a muscle. How long it would have continued in this state is uncertain, as I had no more time to devote to the experiment; just then an attempt was made to pick the curculio up, when, as soon as it was touched, it began to run vigorously. While watching this specimen another was observed on a low outer branch of the same tree which the slight previous jarring had failed to bring down. It remained quite still for a good while on the branch, then walked a few steps, stopping a while again, and so on, during the half hour it did not progress more than two inches in all. An attempt was now made to see if shaking would bring it down on the sheet. Beginning lightly the shaking was increased in rapidity every time until it became quite violent, much more so than any large tree could be shaken, but it maintained its hold on the limb and became more active between the intervals of shaking. Being satisfied that shaking would not do, jarring was tried, when a single tap brought it to the ground.

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### ON NEONYMPHA EURYTHRIS, FAB.

BY W. SAUNDERS, LONDON.

This butterfly appeared earlier than usual with us this year. It is not seen on the wing sooner than the 10th or 12th of June, but this season they were tolerably common as early as the 1st, and probably had been then flying for several days. They delight in the sunny openings found oftentimes in partially cleared woods, also in wooded lanes and roads and the sunny edges of the forest, where by their peculiar jumping flight they may be readily recognized, sometimes singly, at other times sporting in twos and threes.

For the first few days the specimens captured will be found to be nearly all of the male sex, but after this the females begin to appear and both sexes are found together during the remainder of their short season of life which does not usually extend beyond the first week in July. Sometimes an odd specimen may be taken later than this, but it is always battered and worn, as if the protraction of its life beyond the usual time had been attended by many struggles and fightings.

On the 4th of June, 1870, we enclosed a captured female in a pill box for the purpose of obtaining eggs. The box was not examined till the 7th, when several eggs were found attached to its sides. The length of the egg was  $\frac{3}{100}$ ths of an inch. It was nearly globular in shape, flattened a little at the place of attachment. Its color was pale yellowish green and it was covered with a very fine network, the spaces between the meshes being slightly depressed.

The young larva hatched on the 19th and 20th. The box was not examined on the 19th, and when looked into on the 20th, several of the young creatures were too much weakened for want of food to recover. There were two or three which promised well, but after the first few days only one survived, which has been watched over with much care and fed on grass.

Description of the larva fresh from the egg.—Length,  $\frac{5\frac{1}{2}}{100}$ ths of an inch. Head very large, dark brown with a few yellowish hairs.

Body above dull whitish, with a dorsal and three lateral stripes of pale red, on each segment are a number of thick, short hairs or small spines, each arising from a minute tubercle and tipped with a small rounded knob. Under surface whitish, semi-transparent, feet and legs the same.

No description of this insect was taken between the first and second moultings, but after the second moult, July 20th, the following notes were taken :

Length  $\frac{.35}{100}$  inch. Anterior segments nearly cylindrical, posterior onisciform. Head medium size, larger than second segment, flat in front, with a flattened ridge above; color pale greenish, with a black dot on each side and a number of pale brown dots arranged nearly in transverse rows, and thickly covered with very short whitish hairs springing from small bulb-like tubercles; mandibles dark brown.

Body above greenish grey, thickly covered with small whitish tubercles similar to those on head, from each of which arises a single short brown or reddish brown hair; a reddish brown dorsal stripe, and a faint sub-dorsal line of the same on which is a row of dots of a similar color but of a little darker shade, most distinct on middle segments; there is also a stigmatal band of the same, edged below with yellowish green, and a second fairer

lateral line between the sub-dorsal and stigmatal, the latter most distinct on anterior segments; terminal segment forked.

Under surface pale whitish green, feet and prolegs greenish, semi-transparent.

Its growth was very slow for the next two months after which it ceased growing, becoming semi-torpid, eating a very little occasionally for a short time longer, and then it settled down for a lengthened fast which no morsel however green and dainty would tempt it to break. No perceptible change has taken place in its appearance up to the present, December 31, and will not we presume, until the warmth of spring infuses new life into it. The following description was taken a few days since.



Figure 9.

Length half an inch—onisciform (see figure 9). Head large; bilobed, with each lobe slightly pointed above, appearing almost square when

viewed from the front. Color yellowish brown, thickly covered with granulations of the same from which arise short brownish hairs visible only with a magnifyer; there are two or three small black dots on each side, one larger than the other; mandibles tipped with black.

The body above is a little paler in color than the head, of a uniform pale brownish yellow throughout entirely covered with like granulations emitting also short brownish hairs. The second segment is constricted, giving the head a much more prominent appearance than it would otherwise have; it is also free from granulations on its anterior edge not observable when the larva is at rest; but when in motion this smooth edge appears, of a paler hue than the general color and sprinkled with a few black dots. The body is thickest from seventh to tenth segments, and there is a faint dorsal line of a darker shade most apparent on the posterior segments; terminal joint forked; stigmata small, nearly round, and black.

The under surface is similar in color and appearance to the upper, with a ventral row of faint brownish dots; feet and prolegs tipped with brown.

From the facts thus gathered, we can give a short summary of the history of this species. The butterfly appears from the 10th to 25th of June, depositing its eggs singly—fastened on blades of grass—from the middle to the last of the month. Duration of the egg stage, from ten to thirteen days. The larva is then hatched and continues growing until September, when having attained the length of about half an inch, it looks out for a hiding place in which to pass its long wintry sleep. The early spring calls it again to activity, when it begins to feed at once on the young and tender grass, completing its growth probably during the second or third week in May when

it becomes a chrysalis, from which the butterfly appears, to commence afresh the circle of existence. In all probability our other two species belonging to this family—*Boisduvalii* and *Nephele*—have a similar history although they appear later in the season.

## INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

*From Kirby's Fauna Boreali-Americana: Insecta.*

(Continued from page 110.)

51. *AMARA VULGARIS*, Latr.—Length of body 4 to  $4\frac{1}{2}$  lines. Many specimens taken in lat.  $65^{\circ}$ , and in the Rocky Mountains.

Body black, glossy; above black-bronzed. Scape of the antennæ piceous; inner lobe of the maxillæ, and first joint of the outer palpi, testaceous; basilar impressions of the prothorax double, deepish, impunctured, the external one oblique; channel abbreviated anteriorly, with a punctiform impression beyond the middle: furrows of the elytra lightly drawn, indistinctly punctured; apex subacuminate or suddenly narrowed: legs black, with the hairs, spurs and claws testaceous.

Variety B. Bright, bronzed with a cupreous tint.

C. Wholly black.

[An European species, unknown to Dr. LeConte. Stated by Mr. William Couper—but probably erroneously—to be common at Toronto.—*Can. Jour.* 1855, p. 256.]

[39] 52. *AMARA INÆQUALIS*, Kirby.—Length of body 4 lines. Several taken in lat.  $54^{\circ}$ .

Very like *A. vulgaris*, but the two first joints of the antennæ are rufous; the basilar impressions of the prothorax are not so deep; and the interstices of the furrows of the elytra are convex and uneven: in other respects there is little difference between them. [Previously described as *A. interstitialis*, Dej.; taken, according to Dr. LeConte (*Pro. Acad. Nat. Sci., Phil.*, June, 1855, p. 353), on Lake Superior, at Fort Simpson, Mackenzie River, and in Massachusetts, Pennsylvania and Illinois. Also found at Grimsby, and other places in Ontario.]

53. *AMARA IMPUNCTICOLLIS*, Say.—Taken in lat.  $54^{\circ}$ . [Common in Canada; for description *vide* Say's Ent. Works, ii. 463.]

54. *AMARA PALLIPES*, Kirby.—Length of body 3 lines. Only one specimen taken.

Body glossy; underside, mandibles, coxæ and tarsi piceous; upperside bronzed. Three first joints of the antennæ rufous; frontal impressions very

slight, connecting line very distinct: dorsal channel of the prothorax nearly entire; basilar impressions rather punctiform, punctured; elytra not subacuminate: legs yellowish. [Taken on Lake Superior and in Northern New York, according to LeConte; also in Ontario.]

[40] 55. *AMARA LAEVIPENNIS*, Kirby.—Length of body  $3\frac{1}{2}$  lines. Three or four specimens taken in lat.  $54^{\circ}$ .

Body glossy; the underside, legs and antennæ black; upperside black-bronzed: frontal impressions very slight: prothorax smooth, with the basilar impressions very faint: furrows of the elytra very lightly drawn, and sometimes subinterrupted; intermediate trochanters piceous. ["Lake Superior, one pair; a female from Massachusetts, sent by Dr. Harris" (LeConte).]

56. *AMARA DISCORS*, Kirby.—Length of body 4 lines. One specimen only taken.

This species has somewhat the aspect of a *Harpalus*, but it exhibits the true characters of *Amara*: it appears to be related to *A. discrepans*, Stephens. Body dark piceous, glossy. Upper-lip, palpi, mouth and antennæ ferruginous: prothorax a little narrowed behind; bead of the lateral margin rufous; basilar impressions rather slight: elytra less glossy than the rest of the body, the infinitely minute and numerous granular reticulations of their substance being more conspicuous than usual; the furrows of the elytra from minute punctures exhibit a slight appearance of crenulations: legs pale chestnut. [Unknown to Dr. LeConte; the student of the *Amaræ* is referred to his paper on this genus in the Pro. Acad. Nat. Sci. Phil., June 1855, p. 346, for much valuable matter and fuller descriptions.]

[41] 57. *HARPALUS PLEURITICUS*, Kirby.—Taken frequently in lat.  $54^{\circ}$ . [For description *vide* Mr. Sprague's *Carabidæ*, CAN. ENTOM. ii. p. 96. Taken in Ontario and, according to Dr. LeConte, in Minnesota and Winnipeg.]

58. *HARPALUS BASILARIS*, Kirby.—Length of body 4 lines. Taken with the preceding, and in equal numbers.

This species differs from the preceding, which it nearly resembles, in having the two first joints of antennæ yellow, and the remainder dusky; in having the prothorax still wider in proportion to its length, with its posterior angles more acute and impunctured, and with narrower basilar impressions also without punctures; its lateral margin is also black and less prominent: the side-covers of the elytra are likewise black: the legs are dark-piceous, with yellowish-red trochanters. In other respects it resembles *H. pleuriticus*. [Unknown to Dr. LeConte.]

[42] 59. *HARPALUS OCHROPUS*, Kirby.—Length of body  $3\frac{1}{2}$  lines. [No locality stated.]



This comes very near *II. pleuriticus*, but is considerably smaller; the antennæ are longer; the prothorax is impunctured at the base, its basilar impressions are linear; the side-covers of the elytra are chesnut; and its thighs are more robust in proportion. [Unknown to Dr. LeConte; supposed by him to be perhaps *II. desertus*, Lec.]

60. *HARPULUS INTERPUNCTATUS*, Kirby.—Plate vii. fig. 8.—Length of body  $5\frac{1}{2}$  lines. Many taken in lat.  $54^{\circ}$ .

Body proportionally longer than in the antecedent species, black, glossy, not depressed. Head triangular, with a pair of confluent red dots, visible only in the sun, between the eyes; antennæ shorter than the prothorax, with the scape and last joint of the palpi rufous: prothorax subquadrangular; anterior angles rounded; dorsal channel drawn from the apex to the base; punctured especially posteriorly, disk impunctured, transversely wrinkled; basilar impressions shallow; lateral margin dilated posteriorly; elytra rather deeply furrowed, furrows impunctured, interstices convex, very minutely but not thickly punctured: the four anterior tarsi of the male are furnished with a thick brush of vesicles, not arranged in a double series, as in other species of this genus. [Placed, with a mark of interrogation, in LeConte's List, as a synonym of *Anisodactylus melanopus*, Hald., a species taken in Canada.]

[43] 61. *HARPALUS LONGIOR*, Kirby.—Length of body  $5\frac{1}{4}$  to  $7\frac{1}{2}$  lines. Two specimens taken, the largest in lat.  $54^{\circ}$ .

Body black. Upper-lip picceous; antennæ, palpi and legs reddish-tawny, the first longer than the prothorax; the nose terminates anteriorly in a reddish membrane or rhinarium: prothorax quadrangular with all the angles rounded, rather longer than wide; dorsal channel anteriorly abbreviated; lateral margin minutely punctured, much depressed, especially at the posterior angles; basilar impressions double, shallow, and minutely punctured; elytra very little glossed, more than twice the length of the prothorax, furrows impunctured with convex interstices, the lateral ones with some scattered very minute punctures; the vesicles on the sole of the four anterior tarsi of the male are arranged as in the other *Harpali*.

Both the specimens taken in the expedition are males, or I should have supposed the unusual difference in their size was sexual: probably the small one was taken in a higher latitude. [Unknown to Dr. LeConte; thought by him to be perhaps *II. vagans*, Lec.]

62. *HARPALUS LATICOLLIS*, Kirby.—Length of body  $5\frac{1}{2}$  lines. A single specimen taken.

This insect very closely resembles *II. interpunctatus*; it differs principally in having a rather wider prothorax with all the angles rounded, with the dorsal channel abbreviated anteriorly, and with only the base very indistinctly

punctured; the interstices of the furrows of the elytra are also without punctures, and there is a single punctiform impression in the usual situation adjacent to the second furrow. [Previously described as *Anisodactylus nigerrimus* by Dejean.]

[44] 63. *HARPALUS* [*ANISODACTYLUS*] *CARBONARIUS*, Say.—Two specimens taken in lat. 54°. [Taken also in Canada; for description *vide* Say's Ent. Works, ii. p. 460.]

64. *HARPALUS* *ROTUNDICOLLIS*, Kirby.—Length of body 5½ lines. Two specimens taken.

Body brownish, black, glossy. Antennæ length of the prothorax, as well as the tip of the palpi, rufous: prothorax wider than long, with rounded angles; basilar impressions shallow, round and punctured: the elytra exhibit a silky lustre from the granulations on the surface; there is a single punctiform impression in the usual situation near the apex; in this and the following species these organs are transversely truncated with a slight sinuosity; legs rufous or rufo-piceous, with black thighs; coxæ and trochanters rufous. [A variety, according to LeConte, of *H. amputatus*, Say (Ent. Works, ii. 546), a species taken in "Kansas, New Mexico, Saskatchewan, Montreal, Canada."]

[45] 65. *HARPALUS* *STEPHENSII*, Kirby.—A single specimen, taken in lat 54°. [A synonym of *H. amputatus*, Say.]

[46] 66. *STENOLOPHUS* *VERSICOLOR*, Kirby.—Length of body 2½ to 2¾ lines. Three specimens were taken in lat. 54°.

Body dusky-black, glossy. Palpi, mouth and scape of the antennæ rufous; prothorax scarcely longer than wide, rounded behind, with the basilar impressions punctured: elytra reddish-brown,—viewed in the sun or in the light, they exhibit a changeable tint of violet; a punctiform impression adjoins the second furrow; apex slightly sinuated; epipleura yellow: thighs dusky, especially the posterior pair, which are larger than the others; tibiæ and tarsi rufous.

The female has less of the violet tint, and the elytra are of a pale mahogany colour.

Variety B. With the two first joints of the antennæ rufous; legs yellow. [Previously described as *S. fuliginosus* by Dejean; is taken in Ontario.]

### ON THE LARVA OF *DIPHTHERA DERIDENS*, Guénéé.

BY W. SAUNDERS, LONDON, ONT.

A single specimen of the larva of this insect was taken crawling on a fence on the 1st of October, 1866. It must be very rare in this locality as I had never seen it before, nor have I observed it since, nor ever captured a specimen of the imago, which is very handsome. Food plant unknown.

Length 1.20 in. cylindrical.

Head medium sized, rather flat, slightly bilobed, of a pale greenish-white color, with a large patch of black on each lobe above and a smaller one below just above mandibles. Mandibles black, with a streak of white on each.

Body above pale greenish-white, semi-transparent, with transverse rows of tubercles of the same color, from which arise tufts of long, fine, silky, white hairs. On second segment the hairs overhang the head, and there are here one or two black ones on each side mixed with the white. A dorsal line of pale green; stigmata pale white, edged very faintly with pale reddish.

Under surface, feet and prolegs of the same color as upper surface.

The larva entered the chrysalis state shortly after its capture, and produced the imago on the 11th of June, 1867.

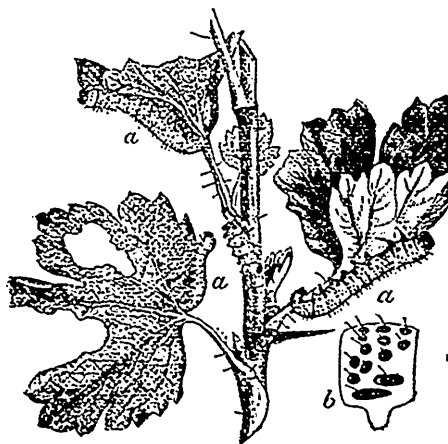
## ENTOMOLOGICAL GLEANINGS.

PAPER NO. III.

BY W. SAUNDERS, LONDON, ONT.

### THE CURRANT WORM IN TROUBLE.

On the 21st of July at a quarter past seven in the evening we were passing around among the currant and gooseberry bushes watching the manipulations of a few of those well known foes, the larva of *Nematus ventricosus*. The accompanying figure will illustrate their appearance and doings; they were feeding away voraciously with perennial appetites, when a disturber of their peace appeared among them in the shape of a small black ichneumon fly which fastened itself on the body of one of their number, and began to deposit its eggs by means of a sharp ovipositor, dexterously thrust through the skin of its victim, whose jerks and writhings, while indicating a very uneasy state, failed to shake off the tormentor. The fly remained some time attached and so intent was



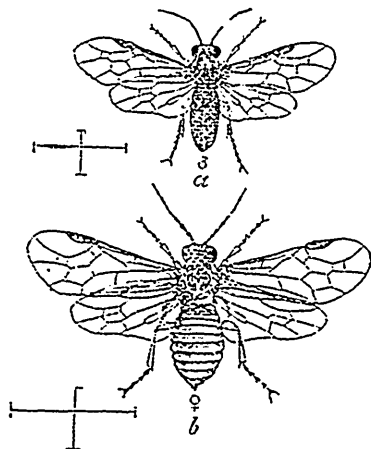
in fulfilling the instincts of its nature that a capture was made of both fly and larva, by the sudden movement of a pill box, but while endeavouring to transfer them to the inside of a tumbler so that their further operations might be better observed, the fly suddenly escaped and was seen no more; the larva also died before reaching maturity, so that its further history could not at that time be developed.

## NEW FOOD PLANTS.

A few days after this and about the end of the month we were not a little astonished at finding a colony of the worms about a quarter of an inch long feeding on the leaves of the black currant which we had previously supposed to be entirely exempt from their attacks. These were collected and fed on black currant leaves until about half grown, when they sickened and died. On the 7th of September a smaller number were found feeding on the leaves of a plum tree, taken and watched in the very act, the leaves were partially eaten all around them, and the worms about half grown. These were also taken and fed in confinement on plum leaves which they ate very well for several days, but from some cause they all died before maturity, whether from confinement, or the unsuitable character of the food it would be difficult

to determine. From the position of the leaves on which these larva were found we thought it probable that the eggs had been deposited on the plum leaves by the parent fly. It was an occasion of regret afterwards that some had not been allowed to remain where nature had placed them, to see whether they would have reached maturity on food which we should regard as so uncongenial.

The figures here given represent the perfect fly on an enlarged scale, the hair lines at the sides showing the natural size; *a* is the male, *b* the female.



## COAXING BUTTERFLIES TO DEPOSIT EGGS.

In the July number of the *Canadian Entomologist*, page 115, is a paragraph from Mr. W. H. Edwards, detailing an ingenious method of his, adopted with the view of obtaining eggs from butterflies by enclosing them in gauze-covered nail kegs, without bottom or top, along with a growing plant of such species as their natural instincts prompt them to deposit on. Carrying out the same idea in another form, and one better adapted to the purpose where large bushes or trees are concerned, we used good-sized muslin bags, so tied as to enclose a small branch or portion of the plant or tree with a few only of the leaves remaining on it, so as to lessen the labor of looking for the eggs and watching when they are deposited. A little ingenuity will enable one by the use of small bits of stick or wire to expand the bag so as to give plenty of room for the insects to flit about inside, and prevent its

collapsing with a shower of rain, and we think that by modifications of this method success in obtaining eggs from almost all our moths as well as butterflies might be secured.

We had often tried to obtain eggs from our commonest red butterfly, *Danais archippus*, by confining them in boxes within doors, but never succeeded in this way; but about the last of June, 1870, we captured four females and shut them up in a bag as described, tied on a plant of the common milkweed *Asclepias cornuti*, enclosing a few leaves only. As early as the next morning they had deposited a considerable number of eggs, which operation was continued for about another day when we counted them and found 150 in all, laid singly on all parts of both sides of the leaves, and also on the leaf stalks and on the muslin bag in which they were confined.

The eggs were 1-25th of an inch long, and a little less in width—exact measurement, 34-100ths of an inch. They were conical, quite flat at the base where attached to the leaf, with about 25 raised striæ or lines, and about the same number of cross lines between each stria, and in the meshes of the net work thus formed were slight cavities. Their color was white, with a faint yellowish tinge, and they were *very firmly* attached to the leaves.

Quite a number of the eggs hatched on the 5th of July, but having lost the date on which the butterflies were enclosed, the exact duration of the egg state cannot just now be given, but we believe it did not exceed six or seven days. The newly hatched larvæ were 1-10th of an inch long, with a large black head on which were a few dark brown hairs. The body was dull white with a slight bluish tint, spaces between the segments dull yellowish, there were a few black hairs on each segment, and the underside was similar in color to the upper but with fewer hairs, feet black; prolegs tipped with black. We had fully intended tracing the history of this larva out, noting the number of its moultings and the changes in appearance each time, but want of leisure prevented us.

#### THE PEAR TREE SLUG.

This disgusting little larva, the progeny of a little blackish sawfly, has been very abundant during the past season and has been the subject of some notes and experiments. In the first place we noted that there were two broods in the season. The parents of the first brood, which pass the winter in the chrysalis state, appear on the wing about the second or third week in May, depositing eggs from which the slugs are hatched, becoming full grown from the middle to the end of June, then entering the chrysalis state underground; the second brood of the flies make their appearance late in July. This year we noticed them at work depositing eggs on the 21st, the young slugs were abundant and about a quarter of an inch long on the 8th of August,

and by the 6th of September many of them were full grown. With us they were much more destructive to cherry trees than to pears, consuming the upper surface of the leaves, some giving the trees a scorched and sickly aspect, in many cases the foilage fell off, leaving the trees almost bare.

As soon as the slugs were observed at work in Spring, they were treated to a plentiful supply of dry sand thrown up into the higher branches with a shovel, and shaken over the lower ones through a sieve, which stuck thickly to their slimy skins, completely covering them up. Thinking we must have mastered them by so free a use of this long trusted remedy, we took no further heed of them for some days, when to our surprise they were found as numerous as ever. The next step taken was to test this sand remedy accurately to see what virtue was in it. Several small branches of pear trees were selected and marked, on which there were six slugs, and these were well powdered over—entirely covered with dry sand; on examining them the next morning it was found that they had shed the sand-covered skin and crawled out free and slimy again. The sand was applied a second and a third time on the same insects with similar results; and now being convinced that this remedy was of little value, they were treated to a dose of hellebore and water, which soon finished them. Ashes were now tried on another lot, the same way as the sand had been, with very similar results. It was also intended to try fresh air-slacked lime, which we believe would be effectual, but having none on hand just then, the experiment was postponed, and the opportunity of testing it lost for the season. We must not omit mention of an experiment with hellebore. On the 13th of August at 8 a.m. a branch of a cherry tree was plucked, on which there were sixty-four slugs; the branch had only nine leaves, so it may be readily imagined that they were thickly inhabited. A dose of hellebore and water was showered on them about the usual strength, an ounce to the pailful, when they soon manifested symptoms of uneasiness, twisting and jerking about in a curious manner; many died during the day, and only six poor sickly looking specimens remained alive the following morning, and these soon after died.

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### ACCENTUATED LIST OF CANADIAN LEPIDOPTERA.

BY E. B. REED, LONDON, ONTARIO.

(Continued from page 123.)

\*.\* For Rules of Pronunciation see page 122.

**COLIAS CHRYSOTHEME**—*Chrysoth'eme*, probably meant for chrysothemis, a name given by Homer to Iphigenia, daughter of Agamemnon.

—— **PHILODICE**—*Philod'icē*. Gr. Philos, a friend; Dicē, one of the hours or seasons, this insect being common through spring, summer and autumn.

- TERIAS—*Ter'ias*. Probably from Pteria, a city in Cappadocia, Asia Minor.
- LISA—*Lī'sa*. Probably from Lisæ, a city of Macedonia.
- DANAIDÆ—*Dana'idæ*. The family of which the genus *Danais* is the type.
- DANAIS—*Dan'ais*. From Danaï, a name often given to the ancient Greeks after Danaus, one of their kings.
- ARCHIPPUS—*Archip'pus*. A king of ancient Italy.
- NYMPHALIDÆ—*Nymphā'idæ*. The family of which *Nymphalis* (a genus of exotic butterflies) is the type.
- ARGYNNIS—*Argyn'nis*. A surname of Venus, from the Temple erected in her honour by Agamemnon on the death of his favorite Argynnis.
- CYBELE—*Cyb'elē*. An heathen goddess, wife of Saturn.
- MYRINA—*Myri'na*. A city in Asia Minor.
- BELLONA—*Bellō'na*. The Heathen Goddess of War.
- APHRODITE—*Aphrodī'tē*. The Grecian name of Venus, the Heathen Goddess of Love, in allusion to the fable of her having sprung from the sea foam "Aphros."
- COLUMBINA—*Columbī'na*. A feminine form of Columbus, the discoverer of America.
- FREYA—*Frēya*. The Scandinavian Goddess of love.
- MELITAEÆ—*Melitæ'a*. A town in Thessaly.
- PHAETON—*Phæ'ton*. A mythological personage, famous for his unsuccessful attempt to drive the chariot of the sun.
- HARRISII—*Harris'iī*. Named after Dr. T. W. Harris, the late talented State Entomologist of Massachusetts.
- NYCTEIS—*Nyc'teis*. From Greek *nux*, night, in allusion to the dark colouring of the under side of the wings.
- THAROS—*Tha'ros*. Probably meant for Pharos, a celebrated island in the Bay of Alexandria, famous for its lighthouse.
- GRAPTA—*Grap'ta*, from the Greek "Grapho," to write or inscribe, in allusion to the letter-like markings of the under side of the wings of this genus.
- INTERROGATIONIS—*Interrogā'tio'nīs*. From the silver markings on the under sides of the wings like notes of interrogation (? ?).
- COMMA—*Com'ma*. From the comma-like markings on the under side of the wings.
- FAUNUS—*Fau'nus*. One of the heathen Roman Gods, the great Patron of the Art of Agriculture.
- VANESSA—*Vanes'sa*. Probably from Swift's poem of Cadenus and Vanessa, in which the Dean (*Decanus*) tells the story of his love for Esther (*Essa*) Vanhombrugh.
- J-ALBUM—*J-Album*, the white J, from the J-like mark on the under side of the wings.
- MILBERTI—*Milber'ti*. Milbert's butterfly.
- PROGNE—*Prog'ne*. A daughter of Pandion, King of Athens.
- ANTIOPA—*Antiopa*. The mother of Amphion, the celebrated musician.
- PYRAMEIS—*Pyramēis*. Greek *Pūramē*, a fire basket, in allusion to the bright flame like color of this genus.

PYRAMEIS ATALANTA—*Atalan'ta*. A celebrated beauty, who made all her lovers run races with her on the penalty of death if they could not catch her.

————— CARDUI—*Car'dui*. Feeds on thistle (*Carduus nutans*).

————— HUNTERA—*Hun'tera*. Hunter's butterfly.

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LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 133.)

CURCULIONIDÆ.

- |  |  |
|--|--|
| Dryophthorus corticalis, <i>Say</i> .        | *Anthonomus suturalis, <i>Lec.</i><br>quadrigibbus, <i>Say</i> . |
| Rhyncolus ——— ?                              | *Otidocephalus scrobicollis, <i>Sch</i> .                        |
| Cossonus corticola, <i>Say</i> .             | Eirrhinus mucidus, <i>Say</i> .                                  |
| *Sitophilus nubilus, <i>Schr</i> .           | Magdalinus olyra, <i>Hbst</i> .                                  |
| pertinax, <i>Oliv</i> .                      | Pissodes strobi, <i>Peck</i> .                                   |
| *cinerea, —.                                 | nemorensis, <i>Germ</i> .  |
| *Ceutorhynchus septentrionalis, <i>Sch</i> . | affinis, <i>Rand</i> .   |
| *inæqualis, —.                               | Lixus concavus, <i>Say</i> .                                     |
| *Copturus quercus, <i>Say</i> .              | *Phyxelus glomerosus, <i>Sch</i> .                               |
| *oculatus, <i>Say</i> .                      | Aphrastus ——— ?  |
| *oblongus, —.                                | Phytonomus ——— ?   |
| Conotrachelus posticatus, <i>Sch</i> .       | Hylobius pales, <i>Hbst</i> .                                    |
| nenuphar, <i>Hbst</i> .                      | *picivorus, <i>Sch</i> .   |
| *anaglypticus, <i>Say</i> .                  | Listroderes ——— ?  |
| *cratægi, —.                                 | Polydrosus elegans, <i>Couper</i> .                              |
| *Rhyssenus palmacollis, <i>Say</i> .         | Sitona lepidus, <i>Sch</i> .                                     |
| Mononychus vulpeculus, <i>Fab</i> .          | Arrhenodes septentrionis, <i>Hbst</i> .                          |
| Grypidius ——— ?                              | Apion ——— ?  |
| Cryptorhynchus luctuosus, <i>Sch</i> .       | Ithycerus curculionoides, <i>Hbst</i> .                          |
| obliquo-fasciatus, <i>Sch</i> .              | Attelabus bipustulatus, <i>Fab</i> .                             |
| Baridius ——— ?                               | Cratoparis lunatus, <i>Fab</i> .                                 |
| *Madarus undulatus, <i>Say</i> .             | *Brachytarsus variegatus, <i>Say</i> .                           |
| *Læmosaccus plagiatus, <i>Fab</i> .          | *Platyrhinus fasciatus.  |
| *Panscopus erinaceus, <i>Say</i> .           | Piaxorhinus ——— ?  |
| Balaninus caryatrypes, <i>Sch</i> .          | Bruchus pisi, <i>Linn</i> .                                      |

The above list of *Curculionidæ* is as full as I can make it at present, but I have a number of species not yet identified; it is a family of acknowledged difficulty, the American species of which have never yet been thoroughly worked up by any competent Entomologist.

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\* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.



## ENTOMOLOGICAL SOCIETY OF CANADA.

A very poorly attended meeting of the Society was held at the Canadian Institute, Toronto, on the 5th of January. The following gentlemen were elected members :

ALEXANDER M. ROSS, Esq., M.D., Toronto;  
 J. GAMBLE GEDDES, Esq., Toronto; and  
 Prof. J. M. B. SILL, Detroit, Mich., a Corresponding Member.

The Secretary-Treasurer laid the following Financial Statement for the year 1870 upon the table :

## RECEIPTS.

By Balance from 1869 .....	\$0 85
" Members' subscriptions paid.....	20 00
" Sale of cork and pins.....	39 42
" " Lists of Lepidoptera and Coleoptera.....	2 95
" Grant from Agricultural Association.....	400 00
" " " Fruit-Growers' Association.....	50 00
" London Branch.....	20 00
" Donation from Mr. J. Pettit.....	15 00
" Grant from Agricultural Association for Woodcuts.....	106 77
	<hr/>
	\$654 99
	<hr/> <hr/>

## EXPENDITURE.

To Printing account, <i>Canadian Entomologist</i> , 1869.....	\$81 40
" Books for Library.....	30 95
" Expenses <i>re</i> Report.....	11 40
" Cabinet for Agricultural Association (expenses).....	1 85
" " for London Branch.....	75 00
" Cork and charges.....	45 57
" Pins and charges.....	31 20
" Postage, \$10 20; sundries, \$2 75.....	12 95
" <i>Canadian Entomologist</i> , 1870.....	67 75
" Woodcuts for Report.....	156 77
" Preparation of Report.....	100 00
" Balance, December 31, 1870.....	40 15
	<hr/>
	\$654 99
	<hr/> <hr/>

## "CANADIAN ENTOMOLOGIST" ACCOUNT.

## RECEIPTS.

By subscriptions.....	\$92 61
" Entomological Society.....	67 57
	<hr/>
	\$160 36
	<hr/> <hr/>

## EXPENDITURE.

To Printing .....	\$114 87
“ Postage and Express.....	9 48
“ Studley & Co., <i>American Entomologist</i> .....	36 01
	<hr/>
	\$160 36
	<hr/> <hr/>

Members of the Society are respectfully notified that their subscriptions (§2) are now due for the year 1871. From the above Statement it will be observed that many members are also in arrear for the year 1870.

All communications and remittances should be addressed to the Rev. C. J. S. BETHUNE, Trinity College School, Port Hope.

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 INCORPORATION OF THE ENTOMOLOGICAL SOCIETY.

Our readers will no doubt be pleased to learn that a bill is now before the Legislature of Ontario, for the incorporation of the Entomological Society, under the Agricultural and Arts Act. The effect will be to place it upon the same footing as the Fruit-Growers' Association of Ontario, with an annual grant of \$500 per annum.

A general meeting of the Society will be called as soon as the bill has passed the Legislature. We shall refer to the matter at greater length in our next issue.

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 SIXTH ANNUAL REPORT OF THE  
 LONDON BRANCH OF THE ENTOMOLOGICAL SOCIETY OF CANADA,  
 FOR THE YEAR ENDING DECEMBER 31ST, 1870.

At the close of another year it becomes the pleasing duty of your Committee to present this the Sixth Annual Report.

The past season has been a favourable one for the Society. Our financial Report exhibits a good balance in hand after payment of all current expenses. Owing to the generous support the Society continues to receive, our roll of members still contains thirty-three names. Again we would thank our friends for their continued assistance to this the only Scientific Society at present existing in the "Forest City." With the liberal donation of the Parent Society we have been enabled to purchase a magnificent cabinet. To prepare it for the reception of insects will be a work of some little time, but we trust in due course to see its drawers gradually filled with choice specimens from all quarters. London has fairly earned a provincial reputation for its Entomological collections. At the Western Fair held in September, four prizes were obtained by our members, and the proceeds as usual transferred to our Treasury. Efforts have been recently made to induce the Society to

keep its material and hold its meetings in the "Mechanics' Institute" of this city now in course of reconstruction. Nothing definite has yet been done in the matter, but your committee would heartily recommend any co-operation with the Institute that can be effected without infringing on the distinctive features and objects of our Society. The publication of the "CANADIAN ENTOMOLOGIST" is still maintained and meets with fair encouragement we believe. We have every reason to hope that the Agricultural Association of Ontario will see fit to continue their grant of \$400 to the Parent Society during the coming year. We are glad to learn that under the auspices of the Parent Society a varied and useful report has been prepared on Insects affecting field and fruit crops, and the Association are having it printed and well illustrated with engravings, which they have most liberally provided. In this work, also, the Fruit Growers' Association of Ontario has given most material assistance by a donation of \$50 towards engravings. We hope to see these annual reports kept up, and believe that most excellent results may be obtained therefrom by their inducing both Agriculturists and fruit growers to become a little better acquainted with the habits and customs of their insect friends and foes. We would in conclusion again urge upon our members to assist by all means in their power, in procuring for the Society, any information that may be brought to their notice respecting any of the various species of the Insect world. We can assure them it will be most gladly received. We would also remind them, that any contributions to the cabinet will be most welcome.

EDMUND BAYNES REID,  
*Secretary-Treasurer.*

WILLIAM SAUNDERS,  
*President, London Branch.*

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#### TREASURER'S STATEMENT, FOR THE YEAR ENDING DEC. 31, 1870.

RECEIPTS.—Balance from 1869, \$5 51; Members' Subscription, (28), \$56 00; Arrears for 1869, \$4 00; sale of Insect case, \$2 00; for the use of Apparatus, \$10 75; from Parent Society, grant for Cabinet, \$75 00; from Parent Society, grant to E. B. Reed, Travelling expenses, \$12 00. *Western Fair Prizes.*—J. M. Denton, \$8 00; Rev. G. M. Innes, \$6 00; Wm. Saunders, \$5 00; London Branch, \$3 00; E. B. Reed, Judge's fees, \$3 00;—Total, \$190 56.

DISBURSEMENTS.—Annual Subscription, Parent Society, \$20 00. *Repaid Loan on Apparatus.*—J. H. Griffiths, \$2 00; J. M. Denton, \$2 00. *Western Fair expenses,* \$5; 12,000 pins, \$12 00; printing Report for 1869, \$3 00; Cabinet, \$75. *Parent Society.*—E. B. Reed, Travelling expenses, \$12; Engravings, &c., as per account, \$30 51. Advertising, postage, &c., \$16 25; Cash in hand, \$12 80;—Total, \$190 56.

LIST OF MEMBERS FOR 1870.—W. Saunders, President; C. Chapman, Vice-President; E. B. Reed, Secretary-Treasurer; J. M. Denton, Curator; H. Becher, W. Barker, Dr. V. A. Brown, Hon. J. Carling, Wm. Carling, S. Chadwick, James Farley, J. H. Griffiths, Rev. G. Gordon, Very Rev. Dean Hellmuth, Rev. J. M. Innes, J. Jeffrey, J. Law, Dr.

Landor, W. M. Moore, Dr. Charles Moore, J. Macbeth, B. A. Mitchell, J. McMechan, S. Mummery, J. Nitschke, A. Puddicombe, Rev. A. Sweatman, A. G. Smyth, J. Symmonds, Dr. Sippi, E. A. Taylor, F. Westlake, I. Waterman.

OFFICERS FOR 1871.—C. Chapman, President; J. H. Griffiths, Vice-President; E. B. Reed, Secretary and Treasurer; J. M. Denton, Curator.

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### NEW BRANCH OF THE ENTOMOLOGICAL SOCIETY AT KINGSTON, ONT.

It is with much gratification that we announce to our readers that a new Branch of the Entomological Society of Canada has been organized at Kingston, Ont. We trust that it will go on and prosper, and emulate in hearty work and zeal the active Branch at London, which has been in successful operation for six years. The following letter has been addressed to us as Secretary to the General Society :

“DEAR SIR,—I have been instructed to inform you that on the 16th instant several gentlemen met and formed a Branch of the Entomological Society of Canada, subject, of course, to the acceptance or rejection of the Parent Society. We passed By-laws, a copy of which I enclose for your perusal and approval. We likewise elected the following Officers:—Prof. N. F. DUPUIS, President; E. H. COLLINS, Vice-President; and R. V. ROGERS, jun., Secretary-Treasurer.

I trust that you will lay our case before the next meeting of your Society, and let us know whether we are accepted or not as soon as possible.

The original members are, Prof. Dupuis, E. H. Collins, O. Meyes, Dr. Neish, T. C. Wilson, and myself.

Yours, &c. (Signed) R. VASHON ROGERS, Jun.

Kingston, Jan. 25, 1871.”

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### DEATH OF MR. A. S. RITCHIE.

We were very much grieved to learn that Entomology has lost one of its most ardent students in this country, by the unexpected death of Mr. A. S. Ritchie, of Montreal, one of the Editing Committee of the *Canadian Naturalist and Geologist*, and author of many valuable and interesting papers on various subjects in Natural History. In our next issue we hope to be able to give further particulars respecting this sad event; at present we have only received information of the bare fact of his death.

At a recent meeting of the London Branch of the Entomological Society, the following resolutions were unanimously adopted:—

1. That the members of this Society have heard with deep regret of the sudden and unexpected death of Mr. A. S. Ritchie, of Montreal. We feel that Entomology has lost in him a warm advocate and an industrious student, and we a valued fellow-labourer. We tender our heartfelt sympathies to his bereaved family and friends in their great affliction.

2. That copies of the above resolution be forwarded to Mrs. A. S. Ritchie, the Secretary of the Natural History Society of Montreal, and the Editor of the *Canadian Entomologist*.

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### MISCELLANEOUS NOTES.

COLLECTING BEETLES IN AUTUMN AND WINTER.—I send you a few specimens of Coleoptera, some of which I think will prove acceptable. In the bottom of the quill you will find *Olisthopus micans*, Lec., and *Bembidium frontale*. In the middle *Sylvanus advena*, *S. Surinamensis*, and *Lathridius publicarius*. In the outer part *Loricera Neoscotica*, *Platynus Ruficollis*, *P. fuscescens*, Chaud.—the latter is not in Leconte's list. Except *Sylvanus* and *Lathridius*, these were taken late in November in a swamp by sifting the leaves from the dry spots (usually taken from the sunny side of an old log) over a cloth. I mention the mode of capture as it may be useful to you, and late in the season will be found the most successful. For a sieve I used a piece of net, such as is put over horses in fly-time, stretched over a hoop. Many common species were also taken. By the same process—using a fine sieve from a fanning mill—I obtained from a little hay, leaves, &c., that had accumulated about the sills of a barn, between 30 and 40 species of beetles, several new to my collection and two or three (*Trichopterygidæ*) that Dr. Horn supposes to be new to science. I think that early in spring the sifting process would be found useful about out-buildings, especially a barn or stable, as many insects are brought from the field in the hay, grain, &c.—JOHNSON PETTIT, Grimsby, Ont., Dec. 29th, 1870. [We are much obliged to our friend Mr. Pettit, for the interesting specimens that he has sent us, and shall be glad to receive further particulars from him respecting his captures and modes of collection.—ED. C. E.]

REARING BUTTERFLIES FROM THE EGG—I see by the July number of the *Entomologist*—you may not know that it has penetrated to this corner of the world—that Mr. Edwards has published an account of his method of obtaining butterflies eggs. Last June he wrote me of his success, and a day or two before I left America I put the experiment to proof on a small scale, using the cans used for preserved vegetables in lieu of a better substitute for Mr. Edwards "powder keg." In this way I obtained quantities of eggs of *Eud. Pylades* on clover and of *Neon. Eurytris* and *Hesp. Mystic* on grass. I had previously found eggs of *Pylades* in abundance in the fields, and had obtained some of those of *Mystic* from confined specimens, but in the latter case they were always laid loosely in the box, never attached, as those of other confined Hesperians. So far as I know, the eggs of *Eurytris* had never

been obtained previously. I have boxed large numbers both of this and of *Pylades* but invariably without result. I trust that others will be induced to try Mr. Edward's simple plan by which we may very greatly increase our knowledge of the earlier stages of butterflies.—SAMUEL H. SCUDDER, Cairo, Egypt, Nov. 15th, 1870.

NOVA SCOTIAN LEPIDOPTERA.—At a Meeting of the Institute of Natural Science, Halifax N.S., on Nov. 14th, the President, J. M. Jones, Esq., read a paper "On the Diurnal Lepidoptera of Nova Scotia, Rhopalocera, Part 1." The following species were common in the province, *Papilio turnus* Linn.; *Pieris oleracea* Harris, *P. rapæ* Boisd., *Colias philodice* Godt., *Argynnis aphrodite* Fabr., *Argynnis myrina* Cram., *Melitæa tharos* Cram., *Grapta C. argentum* Kirby, *Vanessa antiopa* Linn., *Pyrameis cardui* Linn., *P. Iunthera* Smith, *Nymphalis arthemis* Drury, *Erebia nephele* Kirby, *Satyrus alope* Fabr.; while *Danais archippus* Fabr., *Melitæa ismeria* Boisd., *Grapta interrogationis* Godt., *G. comma* Harris, *Vanessa J. album* Boisd., *V. milberti* Godt., *Pyrameis atalanta* Linn., *Nymphalis dissipus* Godt., *Debis Portlandia* Fabr., were rare. The author dwelt upon the introduction of *Pieris rapæ* into this part of the Canadian dominion within the last few years, and alluded to its abundance last summer in the neighbourhood of Halifax, where it did an immense amount of damage to the cauliflower crops. He mentioned the probable benefit that would arise from the introduction of the house sparrow of England (*Pyrgita domestica*) that great enemy of caterpillar life, which would amply repay the trouble and expense of importation. At the present time the caterpillars were almost free from molestation, and it was but proper, when possible, on the introduction of an insect pest, to introduce also its known enemy. The author had observed that even in so small a country as Nova Scotia many species of butterflies were quite local in distribution, and species quite common on one side of the province were altogether unknown on the other, although the distance between such positions was not more than thirty miles. Several Hesperians were yet unnamed, and these when identified with some Lycæniæns, would be included in Part 2.—*Nature*.

LARVA OF *SESIA DIFFINIS*, Boisd.—Length 1.5 to 1.7th inches; head slightly retractile, nearly round, apple-green, covered with minute white granulations; mandibles black; body whitish-green above, yellowish-green at the sides, deep black beneath; legs also black; dorsal and lateral regions thickly granulated in transverse lines; first segment with a yellow collar; caudal horn straight and long, black above and beneath, yellow at the sides; spiracles black, all except the first, somewhat encircled with whitish.

*Variation of the above.*—Head black, body pinkish above, and darker at the sides.

Food plant; the common Snow berry, (*Symphoricarpos racemosus*).

From five larvæ taken Sept. 21st, 1869, in Fayette Co., West Virginia, one imago emerged May 4th, 1870. The above described caterpillars seemed to differ considerably from the description in Morris' *Synopsis*.—THEODORE L. MEAD, New York.

INDIANAPOLIS ACADEMY OF SCIENCES.—We are pleased to learn that a new Scientific Society has been inaugurated at Indianapolis, Ind., under the above designation. As the Corresponding Secretary, Dr. W. W. Butterfield, and one of the Curators, Mr. G. M. Levette, are both entomologists, we may feel sure that our favorite branch of natural history will be by no means neglected.

LIST OF BRITISH INSECTS.—We are glad to see that the Entomological Society of London purpose to publish a general catalogue of the insects of the British isles. In pursuance of this purpose a catalogue of Neuroptera has just appeared. It is enough to state that it is edited by R. McLachlan, F.L.S., to insure confidence in its accuracy, that gentleman having a reputation in this branch of Entomology throughout Europe, and wherever English books are read. The synonymy is copious and we hope that other portions including other orders will soon follow. Meanwhile we commend this portion to our readers, in the hope that they will encourage the Entomological Society to proceed by spending a shilling for the good of British Entomology whether interested in this special branch or not.—*Science Gossip*.

THE WALSH COLLECTION.—We are gratified to state that our efficient State entomologist, Dr. Le Baron, acting under the advice of Gov. Palmer, has purchased for the use of the state the very extensive cabinet of insects which were collected by the late Benjamin D. Walsh. The price paid for the collection was \$2,500 which sum includes the un-paid salary of Mr. Walsh for six months. An order for the money was drawn by the Governor on the contingent fund. The cabinet is temporarily deposited in the fire proof building of the Chicago Academy of Sciences.—*American Entomologist*.

PLATEAU ON THE FLIGHT OF COLEOPTERA.—M. FELIX PLATEAU has supplemented the recent labours of Marey and others upon the flight of insects by examining the movements of the wings of certain Coleoptera. Specimens of the common May-beetle and *Oryctes nasicornis* were selected for experiment. The apparatus used consisted of two pulleys, fastened one above the other, at a distance of two centimetres, on a vertical support; the upper

pulley made twelve turns for each one made by the lower, and could be caused to rotate twenty-four times in a second. The insects were killed by ether vapor immediately before each experiment; and the wings could be fastened, by a simple contrivance, to the front prolongation of the axis of the upper pulley.

A wing, in its folded state, was fixed on the instrument in such a manner that its plane made, with the plane of rotation, an angle of  $45^{\circ}$ , as in the living animal. On turning the pulleys, it struck the air obliquely by its upper surface and front margin; but the small diameter of the apparently continuous revolving disc (as indicated by a graduated scale) proved that the wing was still folded, and that centrifugal force had not affected it. When rotation was produced in an opposite direction, so that the wing struck the air both by its posterior membranous margin and interior surface, the increasing diameter of the disc gave proof of the expansion of the wing, which, indeed, continued to be much extended when motion was arrested. When the plane of a wing was perpendicular to the plane of rotation, and the revolution of the wheel was such that the wing struck the air by its dorsal or upper surface, no extension ensued; when it struck by its lower surface, only partial extension followed. Now the oblique, not the perpendicular plane, is that chosen by nature, and is as has been seen, much more favourable for flight.

On fixing an open wing on the axis so as to make an angle with the plane of rotation, and turning in one direction, the wing remained open; on reversing the direction (*i.e.* acting on the upper surface) it became partially closed.

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#### EXCHANGES, &c.

LEPIDOPTERA.—Canadian Lepidoptera desired in exchange for British.—E. H. COLLINS, *Daily News* Office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLLECTING TOUR IN WESTERN TEXAS AND NEW MEXICO.—At the request of several gentlemen in this country and Europe, I intend to make an extensive eight or nine months Entomological collecting tour in Western Texas and Southern New Mexico, if sufficient means can be raised. I therefore invite every Entomologist, who wishes to enrich his collection with valuable and unknown species, to assist me in the undertaking. To give



everybody a fair chance to get a part of my collections at a limited price, I will divide them into shares at the following rates :

Whole share, \$25. Distribution to be from 250 to 500 specimens, in accordance with wishes (Diurnal Lepidoptera and specialties at agreement).

Half share, \$12 50. Half the above.

Young collectors or beginners at \$5 per 100 specimens.

All sums to be paid in advance.

I shall be obliged by receiving early information from all desiring to subscribe, stating at the same time their wishes. When and where the money is to be delivered, will be notified in due time. No insects will be sold separately after my return, except to subscribers. If anything should happen during the tour to prevent my fulfilling my engagements, or if any one dislikes his share, the money will be refunded. The Coleoptera and Diurnal Lepidoptera will be sent named. Address:—G. W. BELFRAGE, Waco, McLennan Co., Texas (Care of Forsgard & Co).

[We can cordially recommend Mr. Belfrage to our readers as an active and zealous collector: his mounting of specimens is the very perfection of neatness.—F. C. E.]

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