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The Canadian Entomologist.

VOL. II.

TORONTO, DECEMBER, 1870.

No. 12.

OUR THIRD VOLUME.

At the commencement of the year 1870, when relating the improved prospects of the Entomological Society of Canada, we remarked that we had then safely accomplished our first moult, but still continued in a larval state. Most of our readers will no doubt agree with us in the opinion that we were quiescent long enough between the issues of the ninth and tenth numbers of this volume to satisfy the requirements of a pupal state, and that now we may not be thought guilty of presumption when we say that with the first number of our *Third Volume* we expect to come forth in full imago form. We do not intend to burst upon the astonished vision of the Entomological world bedecked with gaudy hues and full of airy lightness, as a gay butterfly in May; but we may perhaps compare ourselves with more propriety to one of those Orthopterous creatures who gradually develop their full powers, without sudden or striking change, and who keep up their larval appetite and tastes to the end. Did we liken ourselves to Lepidoptera, it might be thought that our only office was to sip the sweets of fragrant flowers, and bask for a brief day in the sunshine of prosperity, free from care or thought for the morrow. As Orthopterous, however, we trust that we are of more substantial build, and that, while we gradually increase in size and strength, we may pursue with straight wing the even tenor of our way—borne along on the winds of science, and gathering as we go a full store of contributions, subscriptions, and aid of all kinds.

So much by way of introduction. Let us now briefly state that the **THIRD VOLUME** of the **CANADIAN ENTOMOLOGIST** will be printed on toned paper, illustrated with frequent wood-cuts, and enlarged to twenty pages a number. The subscription will continue to be as at present, *one dollar* (\$1 25 in U. S. currency) per annum in advance, while subscribers will have the additional privilege of becoming members of "The Incorporated Entomological Society of Ontario," if resident within the Dominion of Canada, or associate members if outside the boundaries of this country. We shall endeavour to issue a number regularly each month, and our aim will be to make our periodical

what a correspondent has been kind enough to designate it already, "concise, scientific and accurate." We are happy to announce that our labours will be lightened and our pages improved by the addition of an Editorial Committee, consisting of Messrs. Saunders, Reed and Denton, of London. The magazine—in consequence of various changes that have been made in the Society in connection with its recent incorporation—will in future be printed and published at London, Ont. All remittances and other business communications should be addressed to the Secretary-Treasurer of the Society, E. BAYNES REED, Esq., London, Ont.; all articles, &c., for insertion, to the general Editor, Rev. C. J. S. BETHUNE, Trinity College School, Port Hope, Ont., or to any member of the Editing Committee.

With this number we close our second volume. On looking back over its pages, we cannot refrain from congratulating ourselves upon the measure of success that our little periodical has achieved, though at the same time we are fully conscious of the many failures, shortcomings and imperfections that have occurred during its career. Its chief value has consisted, all will no doubt admit, in its being the means of bringing before the Entomological world the investigations and discoveries of many workers in widely scattered fields; notably among whom we may be permitted to give honourable mention to the name of our warmly esteemed friend, Mr. Wm. Saunders, of London. Our friendly circle of correspondents and contributors—one and all of whom we heartily thank for past favours—will not, we trust, diminish during the progress of the new volume, but will widen out and include the names of many more, till we receive tidings of the Insect world from every Province and State of America, from every county and township of Ontario.

MARCH 29, 1871.

REARING BUTTERFLIES FROM THE EGG.

BY W. H. EDWARDS, COALBURGH, WEST VA.

The results of my experiments with *P. Ajax*, as noticed in Nos. 8 and 9 of the *Canadian Entomologist* (Vol. ii. pp. 115 and 133), are as follows:

From six larvæ obtained from eggs of *Ajax*, deposited in captivity, 16th May, 1870, I obtained two males, four females, *Marcellus*, between 20th and 24th June.

From twenty-four larvæ from eggs of *Ajax* deposited 2nd June, I obtained twelve males, ten females, all *Marcellus*, between 3rd and 9th July, and one chrysalis went over the winter.

From five larvæ from eggs of *Marcellus*, deposited 7th June, I obtained four female *Marcellus* between 4th and 9th July, and one chrysalis went over the winter.

From eighteen larvæ from eggs of *Marcellus*, deposited 2nd July, I obtained fourteen chrysalids, and from these four males, three females, *Marcellus*, between 31st July and 3rd August. One of these chrysalids gave female *Marcellus* on 28th August, several weeks beyond its season, and six went over the winter.

From two larvæ from eggs of *Marcellus* deposited late in August, one yielded in September female *Marcellus*, the other in chrysalis went over the winter.

All these that wintered are alive at the date of this writing.

Mr. T. L. Mead, who spent the summer at Coalburgh, raised a large number of larvæ from several black female *Turnus* (*P. Glaucus*) enclosed in gauze bags on the branches of Tulip Trees, and from these in October we had between 45 and 50 chrysalids. I also obtained several larvæ from *Glaucus* by enclosing the females in a barrel placed over a young tree. We were desirous of seeing the results of breeding from *Glaucus*, and these, when the imagoes appear, shall be communicated.

On 2nd June I confined females *Aesp. Pylades*, Seud., in a keg over a plant of *Desmodium Dillenii*, and obtained many eggs. On 4th June, from females *Lycidas* on same plant I obtained eggs. I raised several broods of *Philodice* in same way.

Mr. Mead (July 5) brought in several larvæ of *Melitæa Harrisii*, feeding on *Actinomeris helianthoides*, Nutt. These were of two broods, and some were $\frac{1}{4}$ inch long others about $\frac{1}{2}$, all alike, black, covered with spines and with a faint yellow lateral stripe. They seem to require dampness, and I succeeded in bringing one of these to maturity by keeping it confined in a close tin box. The previous year I had lost all my larvæ of this species, which I had attempted to feed in open boxes. The chrysalis resembles in form and markings that of *Phaeton*, though the larvæ differed generically from the the larvæ of *Phaeton*. The figure of the larva of *Harrisii* in Packard's Guide is incorrect. Indeed that represents no larva of a butterfly, but of some moth probably.

Sept. 20, Mr. Mead brought in a larva that was quite new to us, generically so, and we thought it might be the coveted *Diana* at last. It was yellow-brown, glossy, with six rows of fleshy spines, all steel-blue in color. Between these spines, in the dorsal rows, white tuberculated spots; the head furnished with two long black spurs like antennae, jointed, and at the end clubbed. This he found on a black alder resting on a leaf. In three days it refused all food (alder), and remained most of the time when observed motionless, but occasionally was very restless, evidently

hungry. Mr. Mead tried it with several sorts of leaves, among them violet, giving it also a drop of water which it greedily drank. It soon after began to eat the violet, and being fed on that grew rapidly, and by 25th September had attained a length of $1\frac{1}{2}$ inches. On 1st October it changed to chrysalis, and resembled much in shape that of *Phacton*, the surface clear pearly color, partly iridescent, and covered with metallic bronze tubercles. During my absence from home the last two weeks of October, this chrysalis yielded imago, *Euptoieta claudia*. Boisduval & Leconte pretend to represent this larva, but we did not suspect the species from their figure.

The presence of this larva on alder several feet from the ground indicates that it rests during the day and returns at night to its food plant (violet). It travelled with wonderful rapidity, and a daily journey of ten feet would be a small affair for it. Very likely the larvæ of other Argynnidae have the same habit, and might be found by beating the bushes near their food-plant rather than by searching the plant itself.

I was not successful this year in obtaining eggs of either of the large Argynnis. In 1869 I succeeded in hatching larvæ of *Diana*, *Cybele*, and *Aphrodite*, but one after another fell off the food plant (violet and vernonia) apparently dried up. Dr. Hayhurst, of Sedalia, Mo., to whom I sent eggs of *Diana*, brought one larva to second moult when it also died. I believe this was owing to the dryness of the feeding boxes. The larvæ, in a state of nature, feed on low growing plants in shady, moist situations. Probably feeding in tin boxes kept moist would answer the purpose. The larva of *Euptoieta* seems eager for water, a thing quite new in my experience with any larvæ, and both those of *Argynnis* and of *Melitæa* may have the same need.

Coalburgh, W. Va., 27th February, 1871.

[NOTE BY ED. C. E.—The above interesting and valuable communication from Mr. Edwards is, we are happy to say, the precursor of many more. In a recent letter he states, "I shall take pleasure in writing pretty regularly to your Journal respecting my own insect breeding, and if other observers will do the same, we can soon get in convenient shape for reference a great deal of information of value to those interested." We trust that this suggestion will be carried out, and that Entomologists throughout North America will freely avail themselves of our pages for the recording of their observations in this and other branches of the science.]

ON *THECLA INORATA*, G. & R., AND *THECLA FALACER*, Godt.

BY AUGUSTUS R. GROTE, DEMOPOLIS, ALA.

In the proceedings of the Boston Society of Natural History, Mr. S. H. Scudder publishes a paper, "On the Synonymy of *Thecla Calanus*," under date of March, 1870.

Mr. Scudder says: "In Eastern North America there are two species of *Thecla*, closely allied, occupying, so far as we know, the same geographical area (from Canada to Virginia or Georgia, and from Massachusetts to Iowa), and, until recently, almost invariably confounded by American entomologists. Messrs. Grote & Robinson first called public attention to the fact of their specific distinctness, although Mr. W. Saunders, both in his correspondence and MSS., had previously urged the same point. As my material was insufficient, and because certain specimens to which I had constant access seemed to combine many of the features which generally separated the specimens into two groups, I have hitherto been unwilling to accept the determinations of these Entomologists. But recently, through the kindness of many friends, I have had the opportunity of examining more than one hundred specimens of each species, and have become entirely convinced of their specific value."

Mr. Scudder then goes on to say: "The most prominent points of distinction between the two species are to be found in the general tint of the upper and under surfaces of the wings, in the presence or absence of orange spots near the anal angle of the secondaries, and in the nature of the extra mesial band upon the under surface."

These points of distinction between the two species, *Thecla inorata*, G. & R., and *Thecla calanus*, Hubner, *spec nobis*, we had previously urged in separating the two species, with the exception that we availed ourselves of no character drawn from the extra mesial band of the under surface in so doing. Mr. Scudder is more fortunate in this respect, and finds "most striking differences between the species" in the character offered by the extra mesial band of the under surface. From a perusal of Mr. Scudder's paper, it might be inferred we had, in separating the species, entirely overlooked the point. Yet this is not the case. In our first paper on the subject we discuss the aspect of this extra mesial band in the closely allied species of *Thecla* belonging to this group. In the Transactions of the American Entomological Society, page 173, August, 1867, we say:—*T. fulacer*, Harris, Ins. Inj. Veg. p. 276, may be assumed as a synonym of *T. calanus*, since, while the "orange colored spot" of the secondaries above is mentioned, "there are two rows of spots bordered on one side only with white," crossing the wing beneath. This latter character would hardly apply to *acadica*, the only other

species to be here considered, since the inner discal band is here completely macular; and though in *T. calanus* this band or row of dark brown spots is also, but more faintly, edged inwardly by a white line, we may assume that this inner edging, always fainter and sometimes wanting on the primaries (*T. calanus* and *T. falacer*), always wanting on the primaries, and in one specimen on the secondaries (*T. inorata*) is not sufficiently constant to afford a specific character. While Harris' *T. falacer* cannot be referred to *Thecla falacer*, Godt, sp., as illustrated by Boisd. Lec., it is probable that his specimens are to be referred to *T. calanus* rather than to *T. acadica*.

It may be here remarked that our conclusion as to Harris' specimens turns out to be correct, for Mr. Scudder refers them in this same paper to *T. Edwardsii*, which is the same as *T. calanus nobis*.

Mr. Scudder further finds that the distinctive character found in the orange spots of the upper surface of the secondaries only to be of relative value, since specimens of *T. inorata* have occurred with these spots, and of *T. calanus* without them, the reverse having been assumed by ourselves in our former papers as the fact. It is, however, quite clear that these spots are the rule with *T. calanus*, the exception with *T. inorata*.

With respect to the synonymy of the two species to be separated, Mr. Scudder differs remarkably from ourselves.

He considers Hubner's figure of *calanus*, which agrees in both sexes with our *T. calanus* in its slightly greater expanse as compared with *T. inorata*, its more brownish color, and in the very distinctly orange spotted secondaries above, as representing *Thecla inorata*, and this mainly from the character of the extra mesial band.

Mr. Scudder says: "The color of the under surface in no way resembles that of *Edwardsii* (*T. calanus nobis*), and is precisely the same as *calanus* (*T. inorata nobis*): a small orange spot painted near the anal angle of the upper surface of the secondaries in both sexes, occurs more frequently in *Edwardsii*, but is by no means absent from *calanus*."

And further: "The orange lunule of the under surface is given rather as it usually occurs in *Edwardsii*, than as in the *calanus*, but is not very common in the latter; and finally, the sexual patch on the upper surface of the primaries of the male is as in *calanus*. That the extent of the coloring is faulty is shown by several features in which it exaggerates either species, and only when doing so does it approach *Edwardsii* rather than *calanus*; in all features of pure delineation it resembles only *calanus*, so that there can be no possible doubt that Grote and Robinson's *inorata* is the same as Hubner's *calanus*.

If Mr. Scudder is right, then the species he calls *Thecla Edwardsii* must be called *Thecla falacer*, Godart. The question of the synonymy of these

species was fully in our mind when we visited Dr. Boisduval in Paris. In the collection of this savant is the typical specimen of Godart, and it is a specimen of *Thecla calanus, nobis*, for which we have used the name of *Thecla Edwardsii* as a synonym. But we are by no means satisfied that Mr. Scudder is right. Opinions may well differ as to a figure without description, which even Mr. Scudder finds faulty. It may be said with equal justice that Hubner's figure represents *T. calanus, nob.* (*T. Edwardsii*), and only where it is defective does it approach *T. inorata* (*T. calanus*, Scudder).

The chances are also against Hubner's having figured both sexes of the usually unspotted *T. inorata* with the spotted secondaries of *T. calanus, nob.* Leconte has certainly figured *T. inorata*, and as we stated before, Boisduval has used the specimen of Godart's *T. falacer* (*T. Edwardsii*, Saund.), while furnishing the text. Boisduval considered Leconte's plate as representing a form of *T. falacer*, Godart, and erroneously so, as Leconte figured for the first and only time *Thecla inorata*; Mr. Scudder's version of Hubner's plate to the contrary notwithstanding. We are at a loss to understand Mr. Scudder's remark, that we have come to an "erroneous conclusion respecting Boisduval and Leconte's plate, which, bad as it is, can certainly only represent *calanus*," (i. e. *T. inorata*). With the exception of the stricture, this accurately represents our published opinion with regard to that plate.

Dr. Boisduval cited Hubner's *calanus* in the text to *T. falacer*, because he considered, and in our opinion correctly, that Hubner's figure represented Godart's species, which latter he had before him. But that he mistrusted both Hubner's and Leconte's figures is very evident. He preferred Godart's later name and used his type.

With respect to the citations of Mr. Scudder, under the synonymy of the two species, there is much that is unnecessary as well as erroneous. Any reference to such an inaccurate compilation as that of Mr. Weidemeyer is a work of supererogation in a matter like the present. Leaving Hubner's figure on one side, we have Godart and Harris's description of *Thecla falacer*, and our own of *T. inorata* to fall back upon, so that the certain determination of the two species with all necessary citations is as follows:

THECLA INORATA:

Thecla inorata, G. and R. Descrip. Am. Lep. No. 3, p. 1, January, 1868.

Thecla falacer, Boisd. Lec. plate xxix., figs 1-5.

Thecla inorata, Saund. Can. Ent., Vol. II., 61-64; G. and R. Trans. Am. Ent. Soc. I. 172-3.

THECLA FALACER:

Thecla falacer, Godart Encyc. ix. 600, 633; Boisd. Lec. (text in part); Harris, Treat. Ins. Veg. Ed. 1862, 276.

Thecla Edwardsii, Saunders i. Litt. G. and R. Trans. Am. Ent. Soc. I. 172.

(?) *Rusticus armatus calanus*, Hubner, Exot. Schm. i., figs. 1-4.

Thecla calanus, Westw. Gen. Diurn. Lep. ii., 486; G. and R. Trans. Am. Ent. Soc. I. 172-3.

We omit purposely all references to Mr. Scudder's notices of these species. Two brief notices of the occurrence of *T. falacer* in New England preceded the paper in the Boston proceedings noticed, and to which the present is a reply.

With respect to the geographical distribution of the two species, while occurring side by side in the Atlantic District, it is probable that *Thecla inornata*, already found from Canada to Georgia, may be found over a wider expanse of territory than *Thecla falacer*.

Demopolis, Ala., December, 1870.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 145.)

67. TRECHUS [BRADYCELLUS] TIBIALIS, Kirby.—Length of body $2\frac{3}{4}$ lines. Only a single specimen taken.

[47] Body black, somewhat glossy. The tip of the palpi and scape of the antennæ are rufous; the prothorax is rather wider than long, but nearly square; the short basilar furrows observable in *Argutor* distinguish this species from the succeeding ones: clytra lightly furrowed, furrows impunctured; in the usual situation adjacent to the second furrow a little beyond the middle of the clytrum a very minute punctiform impression is just discernible; the lateral margin and suture at the apex of the clytra are reddish: the tibiæ are rufous but the cubit is black at the tip; the tarsi are darker, the hand has four dilated joints as in the other species of the genus.

[Belongs to *Bradycellus*; for a synopsis of the N. American species by Dr. LeConte, *vide* Pro. Acad. N. S. Phil., Dec. 1868, p. 379.]

68. TRECHUS [BRADYCELLUS] RUFICRUS, Kirby.—Length of body $2\frac{1}{2}$ lines. Only one specimen taken.

Body black, glossy. Palpi piceous; scape of the antennæ and mouth rufous: prothorax subobcordate; channelled, channel not abbreviated, margin rufous especially the basilar; angles rounded; basilar impressions single, round and punctured: clytra lurid or dirty yellow, with a large blackish cloud or blotch beyond the middle: legs dull rufous, thighs darker. [Included by LeConte, *loc. cit.*, under *B. badipennis*, Hald., a species taken at Grimsby, Ont., by Mr. Pettit.]

69. TRECHUS [BRADYCELLUS] FLAVIPES, Kirby.—Length of body $2\frac{1}{2}$ lines. Many taken in Lat. 54° .

[48] Body piceous, glossy. Head underneath, nose, mouth, and oral organs—except the palpi which are pale yellow—and antennæ rufous; three

first joints of the latter paler than the others: prothorax rufous, rather longer than wide, between square and obcordate; basilar impressions single, very slight, punctured, and black: elytra rufous, with a broad black stripe adjoining the suture and parallel with it; furrows rather deep, impunctured: legs pale yellow.

N.B.—In the majority of specimens the black stripe of the elytra is very faint, and in some evanescent, and the impressions as well as the rest of the prothorax rufous. [Previously described as *B. rupestris*, Say.—Ent. Works ii. 505. Very common in Canada.]

70. *TRECHUS IMMUNIS*, Kirby.—Length of body $1\frac{3}{4}$ lines. Two specimens taken with the preceding species.

Similar to *T. flavipes* but smaller, the nose is piceous, the thorax is more dusky; dorsal channel indistinct; basilar impressions deeper and impunctured: elytra dark piceous with merely the bead of the lateral margin rufous; the furrows also are more lightly drawn: legs darker. [Le Conte, *l.c. cit.*, states that he has not identified this species, but that it is perhaps *Stenolophus carus*, Lec., though the description is scarcely sufficient to warrant the placing of the latter in synonymy.]

71. *TRECHUS* [*BRADYCELLUS*] *SIMILIS*, Kirby.—Length of body $3\frac{1}{4}$ lines. Two specimens taken in Lat. 54° .

Body black, glossy. Mouth reddish yellow; palpi yellow; upper-lip and mandibles rufous, the latter black at the tip; antennæ dusky-rufous, three first joints more yellow: prothorax between obcordate and square, with the whole of the base distinctly and grossly punctured; basilar impressions shallow; limb of the prothorax is reddish-yellow, the disk is occupied by a large square black spot: the suture, lateral margin, and apex widely, and the inner base of the elytra, are reddish-yellow; [49] adjoining the suture is a broad black stripe not reaching the apex; the furrows are rather deep and impunctured; and in the usual situation, a little beyond the middle, a punctiform impression is adjacent to the second furrow: the sides of the fore-breast, the anus and the legs, are reddish-yellow.

Var. B. Thorax without a black spot in the disk, body underneath piceous. [Previously described as *Feronia atrimediis* by Say.—Ent. Works ii. 466.]

[50] 72. *ISOPLEURUS NITIDUS*, Kirby.—Plate i. fig. 6. Length of body $3\frac{1}{4}$ lines. A single specimen taken in the Rocky Mountains.

Body very glossy, underneath rufo-piceous, above bronzed with a light tint of piceous. Upper-lip rufous; palpi, antennæ which are slender, side-cover of the elytra and legs reddish-yellow: prothorax rather wider than long, punctured posteriorly, basilar impressions doubled: furrows of the elytra

slightly punctured, at the apex impunctured. [Placed in Le Conte's List, p. 10, with a mark of interrogation, under *Amara septentrionalis*, Lec., and with the note that the name has been previously employed for another species.]

[51] 73. PATROBUS AMERICANUS, *De Jean*.—Three specimens taken in Lat. 54°. Length of body $5\frac{3}{4}$ lines.

[Previously described as *Feronia (Patrobis) longicollis*, Say.; not uncommon in Ontario. For description *vide* Say's Ent. Works, ii. 466.]

[52] 74. PERYPHUS [BEMBIDIUM] BIMACULATUS, *Kirby*. Length of body $3\frac{1}{2}$ lines. Taken in lat. 65°.

Body glossy, underneath black, above black-bronzed with a slight greenish tint. Head triangular, with a thick convex neck; frontal impressions long and deep; antennæ longer than the prothorax, third joint of the length of the succeeding ones; scape and palpi rufous; prothorax obovate convex, at the base depressed, constricted and grossly punctured; dorsal channel as in *Patrobis*; basilar impressions single, round and deepish; elytra slightly furrowed, with the furrows punctured; the seventh from the suture nearly obliterated; apex nearly smooth, near which is an oblique pale spot; legs rufous with darker thighs, especially in the middle.

N. B.—When the elytra are raised from the body, they are dusky-bronzed. [The old genus *Peryphus* is included by Le Conte as a group under *Bembidium*, Pro. Acad. N. S. Phil. 1857, p. 3.]

75. PERYPHUS [BEMBIDIUM] SORDIDUS, *Kirby*.—Length of body 3 lines. A single specimen taken in lat. 54°.

This so nearly resembles *P. bimaculatus*, that I first put it aside as an immature specimen, but further consideration induces me to consider it as distinct. It is wholly pale rufous, except the head, the prothorax and the anus: the three first joints of the antennæ and the base of the fourth are also rufous: the prothorax appears rather narrower in proportion, and less distinctly punctured at the base; the spot at the apex of the elytra is larger, and the thighs are rather slenderer.

[53] 76. PERYPHUS [BEMBIDIUM] SCOPULINUS, *Kirby*.—Two specimens, taken in lat. 54°. [Previously described as *B. postremum*, Say, Ent. Works, ii. 561].

77. PERYPHUS [BEMBIDIUM] RUPICOLA, *Kirby*.—Taken abundantly in lat. 54° and 65°. Length of body $2\frac{1}{2}$ lines.

This little species appears to be the American representative of *P. littoralis*, which in many respects it closely resembles. It is, however, a smaller insect. The body is invariably piceous or rufo-piceous, and the head and prothorax are of the same colour, bronzed; the antennæ are ferruginous, with the scape

paler; the prothorax is rather shorter. [Included in Le Conte's List as a variety of *B. rupestre*, Dej., *tetracolum*, Say, Ent. Works, ii. 503].

[54] 78. *PERYPHUS* [*BEMBIDIUM*] *PICIPES*, Kirby.—Length of body $2\frac{1}{2}$ lines. Two specimens taken in lat. 65° .

Body black, glossy, above scarcely at all bronzed. First joint of the antennæ rufo-piceous; sculpture of the head, prothorax and elytra precisely that of the preceding species of the genus; elytra unspotted, with two punctiform impressions situated as in *P. scopulinus*, &c.; legs rufo-piceous. This comes very close to *P. nitidulus*, but that species has no punctiform impressions, and the legs are of a different colour.

79. *PERYPHUS* [*BEMBIDIUM*] *CONCOLOR*, Kirby.—Length of body $2\frac{1}{2}$ lines.

Body and members black, glossy, above bronzed. Scape of the antennæ piceous; prothorax less constricted behind than in *P. picipes*; space between the basilar impressions impunctured; elytra more deeply furrowed with larger punctures in the furrows; the lateral furrows are not obliterated, but the apex of the elytrum is impunctured. [A species unknown to Le Conte.]

80. *PERYPHUS* [*BEMBIDIUM*] *QUADRIMACULATUS*, Linn.—Two specimens in lat. 54° . [Subsequently described as *B. oppositum*, Say.—Ent. Works, ii. 501; taken in Canada.]

[55] 81. *PERYPHUS* [*BEMBIDIUM*] *NITIDUS*, Kirby.—Plate i. fig. 7. Length of body $3\frac{1}{2}$ lines. Two specimens, taken lat. 54° .

Body linear-oblong, subdepressed, very glossy, underneath black, above black-bronzed. Head triangular; frontal impressions long and rather curvilinear; scape of the antennæ rufous underneath; prothorax nearly square, and level with curving sides; dorsal channel nearly obsolete; basilar impressions double, the inner one round and rather deep, the other very slight, with a little ridge between it and the margin; anterior and posterior margin nearly straight; elytra with sides nearly parallel as well as the apex impunctured; a quintuple series of punctures adjoins the suture, which extends very little beyond the half of the elytrum, with traces of slight furrows beyond it. [Taken in Canada; a specimen in our collection from Mr. B. Billings, Ottawa, Ontario; at Fort Simpson, Mackenzie River, by Mr. Kennicott; and in the Platte River Valley, by Dr. Le Conte].

[56] 82. *TACHYTA* *PICIPES*, Kirby.—Plate viii. fig. 6. Length of body $1\frac{1}{2}$ lines. Four specimens, taken in lat. 54° .

Body black, glossy. Frontal impressions rather oblique; eyes less prominent than usual in the tribe; prothorax broader than long, subobcordate; basilar impressions, which are single, and dorsal channel, rather deep; elytra with three obsolete impunctured furrows next the suture, which do not reach the apex. Apex rounded; legs piceous. [Previously described as *Tachys*

nanus, Schaum, and *Bemb. inornatum*, Say.—Ent. Works, ii. 502; taken in Canada.]

[57] 83. NOTAPHIUS [BEMBIDIUM] NIGRIPES, Kirby.—Length of body 2 lines. Three specimens, taken in lat. 54°.

Body black, glossy; above bronzed with a greenish tint; the whole upper surface, under a powerful magnifier, appears covered with innumerable granules, which are much more distinctly seen in this family than in the *Peryphidae*. Scape of the antennæ, which are longer than the prothorax, rufo-piceous; frontal impressions parallel; the punctiform impression adjoining the eyes on their inner side has a central elevation: prothorax short, with a deep dorsal channel; basilar impressions double, with a little ridge between the external one and the margin: elytra furrowed; furrows punctured for about two-thirds of their length; the first and second reach the apex, where they are confluent; the third and fourth stop a little short of the apex, and are also confluent, as are the fifth and sixth, which are still shorter, and terminate in a little furrow common to both; the seventh and eighth reach the apex, where they likewise unite; two punctiform impressions, in the usual situation, adjoin the third furrow; at the base of the elytrum, in the interstice between the fifth and sixth furrows, is a longitudinal lurid streak, then follows an abbreviated and articulate band of the same colour, consisting of four streaks, those near the lateral margin being much the longest; in the interstices between the second and third furrows are two such little streaks; near the apex is likewise another band, both articulated and undulated, consisting of seven spots, the marginal one being rather the longest; the tips of the elytra are likewise lurid.

N. nigripes is related to *N. ustulatus*, and appears to be its American representative; it differs from it in having black legs, and the lurid markings of the elytra are different: it comes nearest to Gyllenhal's Variety C. [Vide Pro. Acad. N. S. Phil., July 1860, p. 316.]

[58] 84. NOTAPHIUS [BEMBIDIUM] INTERMEDIUS, Kirby.—Length of body 1½ lines. A single specimen, taken in lat. 54°.

Very nearly related to *N. nigripes*, but the head and prothorax are greener; antennæ as long as the prothorax; the palpi are rufous, with the penultimate joint rather dusky; elytra bronzed-lurid, with a round black spot near the base, a larger near the apex, and an angular band of the same colour between them; the legs are dull rufous. The sculpture of the elytra is nearly the same as in that species, but the fifth furrow, by a turn outward, almost intercepts the sixth and seventh, and then runs to the apex of the elytrum; the furrows themselves are black.

85. NOTAPHUS [BEMBIDIUM] VARIEGATUS, *Kirby*.—Length of body $1\frac{1}{4}$ lines.

This also is related to *N. nigripes*, but is quite distinct. The head and prothorax are without any green tint; the antennæ are not longer than the prothorax; the prothorax is proportionally not so wide before and narrower behind: elytra scarcely at all bronzed; lurid with a large blackish cloud or spot near the base, another near the apex, and an intermediate black angular band; the furrows of the elytra, especially the external ones, do not reach the apex, or at least are obliterated; they are punctured the whole of their apparent length; instead of two, there are three punctiform impressions; the legs are rufo-piceous. [This name is preoccupied by Say's species; Le Conte considers Kirby's species synonymous with *B. versicolor* Lec.]

[59] 86. BEMBIDIUM IMPRESSUM, *Gyll.*—Length of body $2\frac{1}{4}$ lines. Taken frequently in lat. 54° and 65° , and in the journey from New York to Cumberland House. On the sandy shores of Lake Winnipeg, in the spring of 1825 (Mr. Drummond). In Canada (Dr. Bigsby).

[60] Body underneath green, bronzed, very glossy; above bronzed, gloss much obscured, occasioned by an infinity of most minute reticulations, visible only under a good magnifier, which give it a granulated appearance; frontal impressions and ocellated punctures as in *Notaphus*; eyes very large and prominent; palpi bronzed, with the second joint obscurely rufous; antennæ longer than the prothorax, with the scape and the base of the second and third joints rufous; prothorax short, depressed both at the base and apex, the depressed part being wrinkled longitudinally; dorsal channel and basilar impressions rather deep; in the latter are two little furrows; in the elytra, a little beyond the middle, in the interstices between the second and third furrows, are two quadrangular, oblong, slightly depressed spaces, of a somewhat golden lustre, and marked at the anterior end with a punctiform impression; immediately before, between, and after the depressed spaces, is a levigated and rather elevated one of the same shape; the furrows of the elytra are arranged nearly in the same way as those of *Notaphus intermedius*, above described: the legs are rufous, with the thighs bronzed at the apex. [Taken in Canada.]

Genus OPISTHIUS, *Kirby*.

Oral organs scarcely different from those of *Elaphrus*.

Body depressed and flat. *Head* triangular, antennæ much more slender and longer than those of *Elaphrus*, 3rd joint rather longer than 1th. *Prothorax* very short, transverse, scarcely wider than the head; anteriorly obsoletely obtus-angular, posteriorly subrepand, depressed a little at base and apex; chancelled, but without basilar impressions; sides gibbous; angles all

obtuse. *Scutellum* rather obtus-angular. *Elytra*, alitrunk,* and abdomen very much dilated, nearly twice the width of the prothorax, without furrows, with several rows of obsolete mammillated impressions. *Legs* rather longer and more slender than those of *Elaphrus*; the *hands* of the male have the first four joints a little dilated and furnished underneath with a brush.

[61] 87. *OPISTHIUS RICHARDSONII*, Kirby.—Plate i. fig. 9. Length of body $4\frac{1}{4}$ lines; breadth of prothorax 1 line; of clytra taken together $2\frac{3}{4}$ lines. Mr. Drummond, from my description of this curious insect, thinks it was taken in May, 1825, on an island of Lake Winnipeg, frequenting moist muddy places from which the water had shrunk.

Body with the gloss obscured; underneath black, somewhat hairy, above a little bronzed. Antennæ nearly half the length of the body, first four joints greenish-bronzed, the rest deep blue; front with a slight impression between the antennæ and a few scattered short whitish hairs: prothorax very short, more bronzed, transversely very minutely wrinkled: clytra with three rows of oblong greenish very slight impressions, each with a central oblong elevation, with another levigated one between each; adjoining the lateral margin is a fourth series of greenish-bronzed more numerous impressions without any central or intermediate elevations: thighs green-bronzed, tibiæ obscurely rufous, tarsi black, legs hairy. [Taken at Fort Simpson, Mackenzie River, by Mr. Robert Kennicott.]

88. *ELAPHRUS CLAIRVILLII*, Kirby.—Plate i. fig. 8. Length of body 4 lines. A single specimen taken in the journey from New York to Cumberland-house.

[62] Body glossy; underneath green-bronzed; above black slightly bronzed, covered with minute scattered, gilded punctures. Mandibles and palpi piceous; antennæ black, with the three first joints dark blue; front with an elevation between the eyes, rather deeply impressed in the centre: prothorax longer than wide, uneven, with two large discoidal elevations separated by a dorsal channel, each with a central impression; a single basilar impression at the posterior angles tinted with blue: clytra with four irregular rows containing in all twenty-one slight circular impressions punctured, and tinted with blue, each, except the marginal ones surrounded by an elevated ring, and placed in a wider impression; between each of these impressions in the two first rows is an elevated and levigated space: thighs glossy-green, the posterior pair rufous at the base; tibiæ and tarsi piceous.

I am doubtful whether this species may not be Mr. Say's *E. riparius*, but it is not the real one, from which, and *E. uliginosus*, it is distinguished by

* The alitrunk is that part which bears the wings and the four posterior legs.

being much less thickly dusted with green-gold glittering punctures, which gives it a blacker hue. The impression also in the elevated space between the eyes is much deeper. The blue-tinctured impressions of the elytra are also more distinct, and surrounded by a more elevated ring. [Taken on the Island of Toronto by Mr. Couper, *Can. Journal*, 1856, p. 33.]

89. *ELAPHIRUS INTERMEDIUS*, Kirby.—Length of body 4 lines. Taken by Dr. Bigsby in Canada.

This species resembles *E. cupreus*, but it is quite distinct. The body is more thickly and minutely punctured on the whole upper surface; underneath it is of a fine bronzed-green; above it is blacker and less brilliant; the head is greenish; the middle space between the eyes is less elevated than in that species, and wrinkled longitudinally without any impression: the impressions on the discoidal elevations of the prothorax are fainter: the elytra like the other species have a quadruple series of impressions, but they are broader, more slight, without any elevated ring, are more minutely punctured, have a slight elevation in the centre, and are of the same colour with the rest of the elytrum; the marginal series is nearly obsolete; just before the middle, adjoining the suture is a quadrangular elevation which unites with that of the other elytrum: the thighs are green, rufous at the base, tibiae rufous, tarsi pieceous. [Taken in Canada.]

[63] 90. *ELAPHIRUS OBSCURIOR*, Kirby.—Length of body $3\frac{1}{4}$ lines. A single specimen taken in Lat. 65° .

This species is more strongly marked than the majority of the *Elaphiri*. On the underside the head and trunk are copper with a slight tint of green; the abdomen of a dusky purplish copper: above it is copper-coloured; the head, with the exception of the upper-lip, is very thickly and confluent punctured, with a levigated but scarcely elevated space between the eyes; the four first joints of the antennæ are cupreous: prothorax not wider than the head, confluent and thickly punctured; discoidal elevations not conspicuous nor impressed; elytra not glossy, punctured with scattered punctures, marked by a quadruple series of very slight impressions, some nearly obsolete, most of them marked out by a very slight elevated ring and a circle of punctures, three levigated quadrangular spaces near the suture, and arranged in a line parallel with it, and a fourth triangular one removed from it, near the apex; the disk of the elytra is faintly purple: legs bronzed.

91. *NOTOPHILUS AQUATICUS*, Linn.—One specimen taken. [An erroneous determination, according to Dr. LeConte, who considers it to be *N. semistriatus*, Say. For description, which very closely corresponds with Kirby's, *vide* Say's Ent. Works, ii. 497.]

[65] 92. OMOPHRON SAXI, Kirby.—Taken by Dr. Bigsby in Canada: Length of body $3\frac{1}{2}$ lines.

This species seems intermediate between *O. limbatum* and *O. labiatum*. From the former it differs in having a much fainter tint of green on the darker parts of the body; in its black prothorax with silvery sides as well as margin. From the latter in having the lateral furrows as deep and distinctly punctured as those of the disk; and, instead of two reddish spots near the base of the elytra, having two angulato-undulated bands, one near the base and the other beyond the middle, and the tips testaceous; all connected by the margin of the same colour. It seems to have escaped the describers of *O. limbatum* that the upper-lip and lateral margin of the prothorax and elytra are likewise silvery, though not so conspicuously as in *O. labiatum* and *Saxi*.

The sculpture of the elytra in this genus, as well as in *Calosoma*, differs from that of the other terrestrial predaceous beetles in having more than nine furrows, which appears to be the typical number in the section. [Synonymous with *O. Americanum*, Dej.; taken in many parts of Canada.]

[End of the CARABIDÆ.]

LEPIDOPTEROUS LARVÆ FIGHTING;

AND TENACITY OF LIFE IN LARVA OF CLISIOCAMPA SILVATICA.

BY HENRY L. MOODY, MALDEN, MASS.

On returning from a collecting tour, one day in last June, I emptied my larvæ box, putting in a collar box for a short time a larva of *C. Silvatica*, one of the Geometrid and one other Lepidopterous larva: the two last I could not identify, but they were all Lepidopterous. I did not open the box until three or four hours afterwards, when I found a decided change in the appearance of my larvæ. The *C. Silvatica* larva was bitten entirely apart, the head and three first segments being in one piece, the three last abdominal segments in another; the remaining segments were in an indistinguishable mass on the bottom of the box. The geometrid larva was in almost as bad condition, but was not bitten apart; the third was uninjured.

I have always supposed Lepidopterous larvæ incapable of seriously injuring each other, and have never heard or read of their doing so. I have often seen them bite at each other quite spitefully, but their bite seemed to be harmless. But here is surely an instance of decided and continued pugnacity; for to have inflicted the amount of injury that each received must have

required some time, and the appearance of the larvæ certainly indicated that they did not give up the struggle until obliged to from weakness.

An equally surprising circumstance to me was the tenacity of life in the *C. Silvatica* larva. When I opened the box, the fluids from their bodies were thoroughly dried on the bottom of it, showing that they must have had their quarrel at least an hour before; yet the piece of the *C. S.* larva, consisting of the head and three first segments, was quite active. I placed it on my table and watched its movements. It moved at the rate of two inches in three minutes, moving in a direct line. When we consider that it had left only six legs out of sixteen, we must say that it was doing very well. I then placed it on its back, and it moved its legs freely, and made an effort to turn over on its feet. I also noticed that it moved its jaws freely.

What I have related, both in regard to the larvæ fighting, and the tenacity of life, was to me very surprising, but your readers may know of other similar instances. I should like to hear from them on the subject.

THE INCORPORATED ENTOMOLOGICAL SOCIETY OF ONTARIO.

A general meeting of the Entomological Society of Canada was held in the Rooms of the Canadian Institute, Toronto, on Thursday morning, March 2nd, 1871. E. Baynes Reed, Esq. (London), Vice-President, occupied the chair. A goodly number of members were present, including several from the London Branch of the Society.

The minutes of the last meeting, and the Report of the Committee on the Cabinet for the Agricultural and Arts Association, were read and adopted.

Letters were also read from Prof. Hincks, Messrs. Couper, Cowdry and Websdale.

The application of certain gentlemen at Kingston, Ont., who desire to form a Branch of the Society there, was read, and on motion laid over to the afternoon meeting for consideration.

Mr. Reed read the correspondence with the Bureau of Agriculture of Ontario, and gave a statement of the proceedings that had taken place with reference to the incorporation of the Society. He also read the "Act to amend the Agricultural and Arts Act," which had been passed at the recent session of the Legislature, and which included provisions for the incorporation of the Society.

It was then moved by Mr. Wm. Saunders, seconded by the Rev. C. J. S. Bethune,

That the Entomological Society of Canada gladly avails itself of the benefits arising from the liberality of the Government of Ontario, as set forth in

the amended Agricultural Act; and that the meeting do now proceed to comply with the requirements of the Act of Incorporation.—*Carried.*

Mr. Saunders then gave notice that at the next meeting of the Society he would move that the Constitution be amended so as to bring it into accordance with the Act of Incorporation.—The meeting then adjourned.

AFTERNOON MEETING.

A second meeting of the Society was held, pursuant to notice, at 3 o'clock, P.M., on the same day as the preceding, and at the same place.

The President, Prof. Croft, occupied the chair. The minutes of the previous meeting were read and adopted.

In accordance with the notice of motion given by Mr. Saunders at the former meeting, the Constitution of the Society was taken up for discussion, and amended in accordance with the provisions of the Act of Incorporation. [We shall publish the Act and the Constitution as amended in our next number.—ED. C. E.]

The following gentlemen were elected to hold office for the ensuing year:

PRESIDENT—Rev. C. J. S. Bethune, Trinity College School, Port Hope.

VICE-PRESIDENT—W. Saunders, Esq., London.

SECRETARY-TREASURER—E. Baynes Reed, Esq., London.

DIRECTORS—Prof. Croft, University College, Toronto; J. M. Denton, Esq., London; and R. V. Rogers, Esq., jun., Kingston.

AUDITORS—J. H. Griffith, Esq., and C. Chapman, Esq., London.

The following gentlemen were elected members of the Society:—A. B. Bennett, Esq., Brantford, Ont., and D. W. Beadle, Esq., St. Catharines, Ont.

The application from Kingston, for the formation of a Branch of the Society there, laid over from the previous meeting, was received, and permission was granted to establish a Branch, in accordance with the terms of the Constitution of the Society.

After some discussion, it was resolved that Art. I. sec. ii. of the Constitution be held in abeyance till the next annual meeting of the Society, and that in the meantime any person be admissible as an ordinary or associate member on payment of one dollar. The annual subscription of members, entitling them to a copy of the *Canadian Entomologist* and all other publications of the Society free of charge, had been previously reduced in the amended Constitution to one dollar per annum. Any one, therefore, sending this amount to the Secretary-Treasurer can become a member of the Society at once.

It was resolved to transfer the printing and publication of the *Canadian Entomologist* to London, to increase its size, and issue it in a much more attractive form, embellishing its pages with suitable illustrations. The Rev.

C. J. S. Bethune was unanimously requested to continue to act as Editor, and Messrs. Saunders, Reed and Denton were appointed a Committee to assist him in the work. The sum of one hundred dollars per annum was also voted to be paid to the Editor from the Society's funds.

The following was also adopted: "That the hearty thanks of this Society are tendered to the Rev. C. J. S. Bethune, for his untiring zeal and activity while holding the office of Secretary-Treasurer during the last eight years."

The meeting then adjourned.

MISCELLANEOUS NOTES.

COLIAS PHILODICE.—I suspect that at least two species are passing under the name of *Colias Philodice*. I bred from the egg several larvæ last season that differed in important respects from those I had before bred in like manner, and which last agreed with Mr. Saunders' description in vol. i. *Can. Ent.* p. 54. In the first named, on each segment, beneath the white lateral stripe, was a black spot, semicircular, and conspicuous. Mr. Saunders makes no mention of these spots, nor had I before observed them on other larvæ. The imagos from these larvæ are of one of the peculiar varieties, or what has been considered as such, of *C. Philodice*. The species is known to vary widely, but some of the supposed varieties are extreme—almost too much so to be considered varieties, unless proved to be so by actual breeding from the egg.—W. H. EDWARDS, West Va. Jan. 27, 1871.

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 shares, \$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.—ED. C. E.]

COLEOPTERA.—I am desirous of exchanging Coleoptera, especially *Cicindelidæ*, with collectors at a distance.—GEO. DIMMOCK, Springfield, Mass.

COLEOPTERA AND LEPIDOPTERA.—I have a few *Cychnus Andrewsii* and *Ridingsii*, which I should like to exchange for rare Canadian insects: Lepidoptera preferred.—THEODORE L. MEAD, 596 Madison Avenue, New York.

COLEOPTERA.—I should be pleased to exchange Coleoptera with some Canadian Coleopterists, or would purchase species not found in my locality.—ANDREW S. FULLER, Woodside Garden, Ridgewood, Bergen Co., N. J.

ADVERTISEMENTS.

TEXAN INSECTS.—25,000 specimens of Insects from Texas, for sale or exchange. (Reference to Ed. CAN. ENT.)—G. W. BELFRAGE, Waco, McLennan Co., Texas; Care of Forsgard & Co.

CORK AND PINS.—We have received a fresh supply from England, of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Kläüger's pins, Nos. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N.Y.

ENGLAND.—Wm. Wesley, 81 Fleet-street, London, E.C.—Subscription, 5s. per vol.