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The Canadian Entomologist.

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ON PHYSONOTA UNIPUNCTATA SAY, AND ITS SUPPOSED VARIETIES.

BY F. B. CAULFEILD, MONTREAL, P. Q.

As considerable doubt appears to exist with regard to the three species or races of *Physonota* described by Say, Randall, and Walsh and Riley, and as I had in former years found a species of this genus to be rather common in the vicinity of Montreal, I endeavored during the past season to find it again, and, as far as my opportunities would permit, work up its life history.

Early in May I made a careful search in the locality where I had previously found it, but at this date its food plant had not yet appeared above ground. I tried again in June, the time at which I had formerly taken the first brood. The food plant, *Helianthus decapetalus*, was now about two feet high, but the leaves were untouched, and to my great disappointment no beetles were found, as I particularly wished to ascertain the color of the early summer brood, as those which I had formerly taken at this season were of a bright gold color, quite different from those taken later in the year. This difference of color in the broods appears to me to point to the conclusion that *Physonota* may possess the power of assuming different tints, as is the case with some other species of the family. On August 15th I found a colony of the beetles on the same plant, now in full flower. The beetles were all in the autumnal dress, black and white, with testaceous margin. The species is undoubtedly that described by Walsh and Riley as *P. quinquepunctata*, which is, I think, a synonym of *helianthi* Randall. This author describes it as having the "elytra blackish, irregularly spotted with white, with a testaceous margin, losing its color after death, becoming nearly pale testaceous, except the three black spots on the thorax." This agrees very well with the species found by me, except that they have a double spot close to the anterior margin of the thorax, but as this fades soon after

death to olive green, and in old specimens becomes almost imperceptible, while the three posterior spots retain their color, the term *5-punctata* loses its significance. Indeed, on reading Dr. Hamilton's remarks on the species in the CANADIAN ENTOMOLOGST, I examined some specimens taken several years since, and came to the conclusion that they were Randall's species. The description given by Walsh and Riley, American Entomologist and Botanist, vol. 2, p. 4, has, I think, been taken from cabinet specimens, as they give it as "more or less pale dull olive color, dotted with pale yellow. *Thorax* with three black spots behind the middle. Before the middle black spot a double dark olive spot, composed of two trapezoidal spots transversely arranged, and not unfrequently more or less confluent with each other." I have taken the beetle abundantly last summer, and bred a number from the larva, and all mature specimens were pure black and white when living, but they fade soon after death, when they answer to the description given by Walsh and Riley, but in time the anterior spot almost entirely disappears. This double spot appears to be the only difference between *helianthi* and *5-punctata*, and may perhaps have been overlooked by Randall; there may, however, be a form with only three spots on the thorax, as described by him. All taken by me had the double spot, but in many it was confluent.

I found the beetles to be very sluggish, none being observed moving about or feeding. Although living in communities, but one beetle was generally found on a leaf, and they appeared to prefer the leaves situated near the head of the plant. Along with the beetles I found a solitary larva, of which I took the following description: Body depressed, oblong oval. Length almost half an inch. General color dark olive green. Head black. Throax dull greenish yellow, lightest in front. Abdomen dark olive green, with three short yellow stripes on dorsal surface, the central stripe commencing nearest the thorax, thus, —≡—. Tail bifurcate, yellowish green at base, prongs black. Lateral surface with a row of ten simple spines, the first short, black, the next three longer, black at base, central portion white, tip black, remaining spines short, black. Under surface pale olive green, terminal segments black. Legs pale olive green, feet black. When undisturbed this larva kept its tail curved over its back, but frequently altered the angle at which it was inclined. When disturbed it jerked the tail forward and downward until it nearly touched the body. Both body and tail were wet with semifluid excreta, and when thus covered, the prongs of the tail and the lateral

spines would be easily overlooked. When placed in a box it soon lost its wet coat, when the form and color could be distinctly seen. It fed freely until the 23rd of August, when it rested quietly on the bottom of the box. The tail was now extended straight behind the body, and the larva was clean and dry. At this time, if disturbed, it raised the tail slightly, but did not otherwise move. I examined it every day, but noticed no change, On looking at it on the morning of the 27th August, it had changed to a pupa. Length of pupa a little over a quarter of an inch. Form oval, sub-depressed. Thorax slightly wider than abdomen, margin of the thorax dilated. Disk of thorax with three black spots near posterior margin. A double green spot close to anterior margin, but not touching it. Dilated margin green; from the centre of the lateral margin a black line extends through the green a little way on the white. Posterior margin edged with a narrow line of black. Abdomen immediately behind thorax, green, centre white, remainder of abdomen pale yellow. A row of five black spots close to lateral margin, centre with three interrupted transverse black lines. Elytra green, spotted with pale yellow, sutural margin bordered with a narrow black line. Just behind the elytra, on the lateral margin of the abdomen, there is a slightly elevated, oblong, pale yellow spot, upon which is situated two very short white spines. On looking at it at noon on September 11th, the beetle had apparently just emerged, as the elytra were, with the exception of the white spots, pale green and semi-transparent. The wings were not yet folded, extending beyond the body. At 6 p. m. the elytra had become much darker and were but slightly transparent, and the wings were now folded beneath the elytra. On the 13th its colors were pure black and white. On the 24th of August I found a colony of eleven larvae, identical with the first one found, one beetle and one pupa. The latter was on a leaf which had been partly eaten by larvae; it was attached to the leaf by the posterior extremity, the larval skin being pushed behind and slightly beneath. It rested on the upper surface of the leaf, with the head pointing to the base of the leaf, and was partly concealed by the withered edges of the leaf, which were curled inwards. This was the only pupa found, although I searched carefully on several occasions, but as the food plant was abundant I may have overlooked them. *Physonota* may perhaps leave the food plant before transforming, but this would not be in accordance with the habit of allied species, which usually attach themselves to the under surface of a leaf. The specimens reared in confinement did not appear to be particular as to

situation, some pupating on the bottom of the box, others beneath the lid, while others again attached themselves to the side, in every instance producing a perfect beetle. The lot of larvae taken August 24th had all changed to pupa on September 8th. They began to emerge on September 17th, and were all out on September 20th.

On August 26th, I found a large colony of larvae and beetles. The larvae were of two sizes, some very small and others about full grown, but about the only noticeable difference, apart from size, was that in the young larvæ the yellow markings were scarcely to be seen. The small larvae had lately moulted, and the cast skins were on the leaves, showing that in this respect *Physonota* differs from *Coptocycla* and *Cassida*, the larvae of which slip the cast skins on the tail. Until nearly full grown, the larvae of *Physonota* are social, keeping together in compact groups, the heads in the centre, surrounded by a circle of uplifted tails, presenting a most curious appearance. When nearly full grown they separate and scatter over the plants. By most of the later writers on the insects in question, but one species is recognized, *P. unipunctata* Say. Prof. Riley, in the Supplement and Index to Missouri Reports, p. 53, says: "*Physonota quinquepunctata* Walsh & Riley (Rep. ii., p. 59).—This is synonymous with *Ph. unipunctata* (Say), there being no question as to the specific identity of the two, both having been bred by Mr. F. H. Chittenden, of Ithaca, N. Y., from larvae on wild sunflower (Helianthus)." That *P. quinquepunctata* W. & R. is synonymous with *P. helianthi* Rand., is I believe correct, but its identity with *P. unipunctata* Say is I think still an open question. With regard to this point Dr. Hamilton writes me: "But even if they were so bred, it does not prove identity, because (if species) both are found in the same vicinity, and may have mingled on the same plant. Besides it may have been *helianthi* instead of *unipunctata*, since both go by the same name."

The records of these species appear to me to point to the conclusion that they are distinct. Say describes his species as yellow, with the margin whitish. Dr. Hamilton, CAN. ENT., vol. xvi., p. 135, speaking of a colony of *unipunctata* found by him, states that all taken were of Say's type, pale above with *one* black spot on thorax. He also tells us that a few of the larvae were feeding with them, their colors bright yellow. As in all the *Cassidæ* the colors change after death, I wrote to Dr. Hamilton, asking him what the color of the specimens found by him was in life. In answer he informed me that all taken by him were entirely pale, except the black.

thoracic spot. From these accounts it would appear that there is considerable difference between these forms, the larva and beetle of *unipunctata* being light in color, while *helianthi* is dark. With regard to food plants, so far as known *helianthi* is confined to sunflower *(Helianthus)*. Randall says: "Many specimens of our species occurred at Farmington, near the margin of the Sandy River, on a species of *Helianthus;* a great many of these plants were almost wholly deprived of leaves by their ravages."

So far as I am aware, there is no authentic record of typical *unipunctata* having been observed feeding on *Helianthus*. *Unipunctata* was taken by Dr. Hamilton feeding on mint, *Monarda fistulosa*. He further informs us that they "must have fed on the *Monarda* from choice rather than necessity, because three species of *Helianthus* grew with it and were not eaten by either larva or beetle." Prof. Riley, American Entomologist and Botanist, vol. ii., p. 4, states that he has "observed the one-dotted Tortoise-beetle *(Physonota unipunctata* Say) feeding in the larval state upon a Sow-thistle *(Sonchus)*." Both forms seem to be widely distributed; Say records *unipunctata* from Missouri; Dr. Hamilton records it from Allegheny, Pa., but states that it had no doubt been brought from some more northern region during the annual spring inundation. *Helianthi* is recorded from Rock Island, Ill., by Walsh, or its var., *quinquepunctata*. Messrs. Hubbard & Schwarz record *unipunctata* from the lower peninsula of Michigan, but do not state which form was taken. Montreal is the only Canadian locality from which I find *Physonota* recorded. In D'Urban's list of Montreal Coleoptera (Canadian Naturalist, vol. 4, p. 307) he gives *Cassida unipunctata* as common on the Mountain. This probably would be *helianthi*, as I have found it common on Montreal Mountain, but have never met with a typical specimen of *unipunctata*.

I hope that entomologists will look out for these species during the coming season, and if successful, let the readers of the ENTOMOLOGIST have the benefit of their observations.

The food plant was kindly determined for me by Dr. J. B. McConnell.

NOTE ON XIPHYDRIA ALBICORNIS.

BY W. HAGUE HARRINGTON, OTTAWA.

This species was abundant from the middle of June to the end of July, and I observed the females ovipositing on our shade trees (maple)

in various parts of the city. It appears to prefer trees which have been recently transplanted, and which are naturally not so vigorous as those which grow undisturbed. My next-door neighbor set out several young trees, from one to two inches in diameter, and upon these I took several specimens. On the other hand, I observed them, beyond the city, ovipositing in quite large and old maples, and even upon the limbs of an old tree which had been broken and blown down. Thus, it appears, that the size of the tree does not make much difference to them, and that in the city they attack the smaller trees because they are less vigorous than those that have recovered from the effects of transplantation.

PROTECTIVE COLORATION IN THE GENUS CICINDELA.

BY C. H. T. TOWNSEND, CONSTANTINE, MICH.

In the summer of 1884, while collecting the green tiger-beetles in the woods, it struck me very forcibly how the Cicindelæ that inhabit such places—*sexguttata* Fab. here, *campestris* Linn. in England, others elsewhere—are for the most part of a beautiful green, so as to assimilate in color with the surrounding vegetation and herbage among which they may alight; while those that frequent the bare ground, banks, sand hills, sandy stretches, beaches, bars—*vulgaris* Say, *repanda* Dej., *maritima* Dej., and many others—are of the colors easily assimilative with those that surround them on the flats and stretches where they are found.

Although those of the class first referred to often alight upon bare ground, it is mostly at such places as have been cleared by man (I am speaking of *sexguttata* Fab. now, this being the only species of a conspicuous green that I have had the opportunity to observe in its native habitat), their original haunts being the fresh, green woods, where nearly everything is clothed in greenness in its natural state. There they can hardly be distinguished when they are alighted, even though on a log, for the dazzling greenness of the forest at the time these insects appear fastens that color upon the eye, so that for the moment they become invisible, though you may be looking directly at them—invisible, certainly, so far as recognition is related to invisibility; every collector knows that it takes practice to distinguish these insects in their native haunts. Even though the surrounding vegetation is sparse, the effect is the same. This arises

from the liability of the mind to class everything green in the woods as belonging to vegetation, or, in other words, from our inherent tendency to place animals or locomotive beings as different in color from plants. When, as is often the case, they are alighted on sandy banks in or near the woods, the effect is similar; the surrounding greenness makes them difficult of detection here, as well as in other spots, even away from woods, where they may be side by side with vegetation. The momentary invisibility which the insect therefore possesses gives it a chance to escape, if it chooses to make use of this chance. But as long as everything remains quiet it seldom flies, trusting rather for protection to its habit of remaining perfectly motionless, combined with its similarity in color with surroundings. In the natural state man is not its enemy, but its assimilative coloration probably protects it in a great degree from its many known enemies among the birds and reptiles.

A fine and rare English species, *germanica* Linn., which is said to frequent most a certain favored locality in the Isle of Wight (Black Gaug Chine), unlike most of the genus, prefers wet to dry places, and has a liking for brackish marshes.* It is of a beautiful rich green, and thus is enabled to escape observation amid the vegetation which thrives in such places.

Of the other class, our most common species, *vulgaris* Say, is as nearly invisible as an insect can well become by assimilation in color with its surroundings. It is only the practiced eye that can distinguish it from the soil or sand upon which it alights; for, in either case, those parts of a different color from the surface upon which the insect is resting will be mistaken for particles of foreign matter, giving the eye no chance to rest upon form. I have often, before I became used to the practice, looked most carefully for a long time when I had distinctly seen a specimen of this species alight, but without being able to distinguish it until it moved.

A southern species, *tortuosa* Dej., which I have taken in Louisiana, has very little of the lighter markings upon it, but is nearly all of the sombre shade of the sandy mud flats over which it runs and flies.

A fine western species, which I have taken in Kansas on the sand-bars of the Kansas River, at Lawrence, during low water in the summer months, is *macra* Lec. In this the markings have united so as to form an etched border to the elytra of just the light color of the fine sand of

* Rye, British Beetles, p. 47-48.

the bars, so that it can hardly be detected where alighted, the darker parts being easily taken for bits of drift-wood or pebbles.

These notes being intended only as a mention of this interesting subject, I will not bring up any further species, for they will nearly all be found equally well adapted in this way to their surroundings. Species are to be found all over the world, many of which would furnish more interesting cases than the above. I might mention that I have lately received from New Zealand two fine species, *tuberculata*, Fabr., and *parryi*, White. In the former the markings have united, while in the latter they have become somewhat indistinct, the elytra having a very thin and delicate appearance, as indeed has the whole insect, leaving the markings not well defined. These species would be hard to detect alike in sandy places or on darker soils, though *tuberculata*, Fabr., is better adapted to the former, and *parryi*, White., to the latter.

Many of the species differ from others in the number of the elytral markings; but it is the base color that concerns us here, for it is this that makes the insects hard to discern from their natural surroundings, while the lighter markings help the effect. Thus those of the bright green woods have the base color of the same dazzling, brilliant green, while others have it of the duller color of the soils they frequent, or are considerable modified, as *macra*, Lec., and the nearly related *cuprascrus*, Lec., *puritana*, Horn, *wapleri*, Lec., and especially the two Mexican species figured by Schaupp, in his synopsis, * so as to have the markings unite, and, so far as the effect goes, take the place of the original background and themselves become the real base color, conforming more to the color of the white sand of the bars upon which they are found. It is noticeable that in all this variation the elytral markings, when they occur, keep the one creamy white color, however the base color may change. If the markings are united, becoming the base in effect, the other parts retain their dull color as before. In short, there is generally an irregular light edging to the insect, often broken, which gives it an irregular outline, so that it will not readily assume form. Had we never observed these species in their natural habitat, this alone would prove to us that they were terrestrial in their habits.

They do not take for ornament conspicuous colors upon conspicuous

* Schaupp, Synopsis of North America *Cicindelidæ*, Pl. III., figs. 85 and 86. (From Bull. Bkl. Ent. Soc., vol. VI.)

parts. The under parts are generally of a deep green or bluish, irrespective of the insect's habitat. These colors do not show from above. On this account many of the species seem to be more brightly colored beneath than above, except in such cases as afford the bright colors above a chance to assimilate with soils or foliage. Yet the upper parts are really the more richly colored in all the species, though they may not appear so to the causal eye. Here, in the coloration of the upper parts of the *Cicindelæ*, natural and sexual selection blend. They act together at the same time upon the same parts. While sexual selection produces beautiful tints, natural selection takes care that none remain that will endanger the insects preservation by making it conspicuous in its retreats. In this way colors, which otherwise would be prominent, assume a general dull appearance, which will not arrest the eye. Life is of primary value, but so also is beauty to the perpetuation of the insect. While the upper parts retain the colors that will assimilate well with their surroundings, sexual selection has given them tints, which though in many cases seemingly dull to the eyes of man, are found under a high lens to consist of the most lovely bronzed, purplish and dazzling green reflections, in the entirety of which beauty the insects appear to themselves by virtue of their far superior sight development.

LARVA OF SEIRODONTA BILINEATA, PACK.

BY G. H. FRENCH, CARBONDALE, ILL.

Length 1.20 inches ; cylindrical, rather slender, two warty elevations on the dorsum of joints 5 and 12, elsewhere the piliferous spots scarcely perceptible, except for the single hair that arises from each. Color green; a dorsal pale yellow line, bordered on each side on joints 3 and 4 by a purple line ; outside this a pale yellow stripe that diverges on joint 2, gradually diverging again on joints 4, 5 and 6, where it reaches below the usual region of the subdorsal line, extending from this back to joint 11, from which it gradually converges to the elevations on joint 12, touching these on the outside, the diverging and converging referring to the stripes on both sides of the body. These stripes send more or less prominent deflections down the sides of joints 7 and 10. In some examples the space between these stripes and the dorsal line contains a pale whitish stripe each side of the dorsal ; the deflections, and a little on joint 5 and

the elevations, are reddish purple. In other examples the whole space between the lines, except four or five greenish patches, is reddish purple, there being various intergrades. In all cases the purple is mottled. The sides are specked with purple; stigmatal line yellow with traces of one above this. Head with a dark purple line each side, outside of which is a yellowish line.

The larvæ from which this description was taken, 13 in all, were taken on a young elm tree September 29, 1884. By October 5th all but one had disappeared for the purpose of pupation, going beneath the surface of the dirt in the breeding cage. Nine imagines were produced the following spring, the times of emergence ranging from May 24th to June 7th. There seems to be two broods in a season, for larvæ were found on elms during the early part of summer, but these were not reared to find out the period of the summer brood.

NOTES ON PAPILIO TURNUS AND PYRAMEIS CARDUI.

BY MRS. C. H. FERNALD.

Previous to the summer of 1884, *Papilio turnus* and *Pyrameis cardui* had been quite rare in Orono, Me., and vicinity, not more than half a dozen of the former and two or three of the latter having been seen each year; but in June of that year *P. turnus* was so abundant that it was not uncommon to see a dozen or more flying together. In August of the same year fresh specimens of *P. cardui* were so abundant that in a small piece of red clover, not more than two rods from the house, I captured twenty-five in half an hour, and the numbers were not perceptibly diminished. The next day they were equally abundant, but the following day we had a cold rain storm, after which only a very few poor, faded examples were seen. The next summer (1885) *P. turnus* was again rare, and not one example of *P. cardui* was seen by myself, nor by any one in this vicinity. Parasites might have made the difference in the number of *P. turnus*, but could they have done so with that immense number of *P. cardui*, or did that storm so effectually destroy them before laying their eggs that there were none the next year, or is it possible that some epidemic attacked them, leaving none to perpetuate the race? We can understand the gradual increase and decrease of certain species which is noticeable every year, but the sudden abundance and scarcity of some

species is a subject of great interest, and one about which but very little is known at present.

I have in my possession a male *Papilio turnus* which has only two wings. An examination shows that the hind wings are undeveloped; on one side the membrane is pushed out and rounded at the end about as large as the head of a pin, and on the other side the membrane is no longer, but is broader and somewhat flattened, showing plainly that the wings have not been broken off, but have never developed. This specimen was captured on the wing, while hovering over lilac blossoms, and appeared to fly as well as perfect specimens.

In the summer of 1884, I captured a male *Papilio turnus* which differs very much from any I have ever seen or read of. The outer half of the upper side of all the wings is black, except the row of yellow spots on the outer margin of the wings. These are round or nearly so, instead of elongated, and there are only six on the fore wings. The inner half of the fore wings is like the ordinary *P. turnus*, except that the two black streaks are united from the costa down about half their length. The under side of the fore wings is like the upper side, but slightly dusted with yellow. The under side of the hind wings has the blue extended nearly as far in as the black upon the outside, and, together with its black border, is very strongly curved or toothed towards the base. All the yellow on the wings is darker than on the common form, and the insect when flying looked more like a male *P. asterias*, except in size, than like a *P. turnus*.

It was captured in June on the bog where *Chionobas jutta*, *Chrysophanus epixanthe*, and several other rare lepidoptera are found.

NOTES ON CERESA BUBALUS, Say.

BY JOHN G. JACK, CHATEAUGUAY BASIN, QUE., CAN.

Read before the Montreal Branch Ent. Soc. of Ont., 9th Feb., 1886.

During the past two years, but more especially this season, we have been very much troubled and annoyed by the attacks of the Buffalo Tree-hopper (*C. bubalus* Say) on the young trees in the orchard. Most of the trees have been seriously injured by having the bark cut up by the ovipositors of these insects, when depositing their eggs. These incisions

and the eggs in them were so numerous that in many cases it was impossible to raise the bark for the purpose of "budding" the trees.

The incisions and eggs are usually most abundant on the south and the upper side of the limbs, comparatively few being found on the shady or under sides. The first imagines were noticed in the orchard on July 16th, and a few days later they became quite abundant. On the young tender twigs of the apple trees, especially those nearest to the ground, large numbers of the insects were found busily extracting the juices with their slender beaks. Upon close examination the twigs plainly showed the traces of their punctures. They were also very abundant on beans, potatoes and several kinds of weeds, in many cases completely covering the stems, and all engaged in feeding upon the juices of the plants. Bean-stalks that were attacked in this way were considerably injured, as numerous dark knotty formations occurred at the places that were much punctured, so that the growth of the plant was decidedly checked.

The insect was first noticed depositing eggs about August 12th, and a few incisions were then to be found on the branches. This depositing of eggs continued until Oct. 8th, when a severe frost killed a great many of the tree-hoppers, although a few escaped and continued the work until Oct. 26th. After that date they were not noted.

Some of the eggs of the season of 1884 were collected last spring and kept in a very tight box. They were hatched during the first week in June, and with them were a number of small Dipterous flies, evidently parasites upon the eggs of *Ceresa*. I watched for these parasites in the summer and autumn, and first found them August 31st, on limbs where the tree-hoppers were depositing eggs. The parasites were found in larger numbers a little later, and I had the satisfaction of distinctly seeing a number of them insert the abdomen and sometimes almost the entire body deeply into the gaping slits made by the ovipositors of the tree-hoppers. Prof. Riley thinks that the parasite may be an undescribed species.

As I did not know the best conditions or food for the young larvæ of *Ceresa*, I placed them in a glass jar and gave them the tender twigs and leaves of apple trees. From these they seemed to extract the juices, and they could be seen in rows on the ribs of the leaves, with extended beaks, while little particles of a clear gummy substance were often found at the places where the insects had been sucking the juices. I afterwards added bits of grasses, etc., to their food, but after some time they ceased feed-

ing, and finally they all died, none of them being more than half grown. This was about July 5th, and about this time I found a number of the larvæ about some raspberry canes in a shady place, and on July 13th I took more of them among low juicy grasses and thistles, growing thickly in a cool, moist place, several rods from any trees of any kind. On July 17th, nearly all these larvæ changed to the adult form.

The larva becomes much elongated as it begins to cast the last envelope, and one of them, noticed when just beginning the operation, took three hours to complete it.

The full grown larva is about 8 m.m. in length, and light green in color, somewhat lighter than that of the mature insect. The young larvæ appeared to be of a darker green than they were at a later period of their growth. The general shape is triangular, like that of the mature insect, but the broad horn-like projections are not seen in the larva. The eyes are prominent. On the front of the elevated thorax, and behind each eye, are two short, strong spines, one above the other, armed with several lateral prongs or forks; higher up, near the apex of the triangular shaped throax, are two more, somewhat larger armed spines, and the last two visible thoracic segments are each provided with a pair of these branching spines that are still longer. There is also a pair of these spines, each armed with about 6 or 7 barbs, on each of the abdominal segments next to the terminal. These are graduated in length, the shortest being on the last segments, and the longest hardly more than a millimeter in length. The thoracic spines project forwards, while those on the abdominal segments are drawn forward at the base and then curve back, strongly suggesting the dorsal fin of a fish. On the last segment, which is long and tapering, there are two short armed spines directly above the anal opening, which is terminal. The ventral surface of the abdomen is scatteringly covered with short, strong bristles or hairs. The legs are also covered with stiff hairs.

The eggs, in batches of from 5 or 6 to a dozen (rarely more), are deposited obliquely in the bark, and often the incision continues into the wood, if the bark is thin. In this way the bark and wood become fastened together, and will not separate at any season, and the dark spots in the wood and the rough knotty bark bear evidences of the injuries for many years.

The eggs are of a dirty transparent white, about 1.5 m.m. in length, smooth, slightly tapering, and sharply rounded towards the interior end,

but tapering much more gradually at the exterior end. Although normally round, the sides are generally found to be more or less flattened by pressure from the tissues of the wood and bark of the tree. So numerous were these eggs on some trees that a careful estimate shows that there must be at least from six to eight hundred eggs in a section of the branches not more than an inch long and half an inch in diameter.

I have not been able to find a remedy, and perhaps the best is to destroy as many of the egg-bearing limbs as possible. It is to be hoped that the little parasitic flies will increase, and this seems probable. On Sept. 17th I found 5 or 6 tree-hoppers ovipositing on a piece of branch about 4 inches long, and on the same section were 12 or 15 of the parasitic flies.

THE COLIAS CONTROVERSY.

BY R. H. STRETCH, SAN FRANCISCO.

It is to me a most distasteful task to take part publicly in the "Colias" controversy between Mr. Edwards and Dr. Hagen, as I was an invited guest of Dr. Hagen on the trip to Washington Territory, where the events took place which have given rise to the discussion; but in the interest of science, which seeks nothing but the truth, it seems as though the time had come when I ought to state in a concise manner what I know of the whole matter. I have been cut off from all my books for the last five months, while travelling from place to place, or this letter would have been written earlier. I did not know till quite recently the phase to which the controversy had arrived. Probably the best thing I can do is to state the manner in which our party was organized, and the manner in which our collecting was done.

The party consisted of Dr. Hagen, and his assistant, Samuel Henshaw. In San Francisco I was invited to join it, and did so.

Mr. Henshaw was a skillful coleopterist, a department of entomology of which I knew but little, so by mutual agreement I became practically the lepidopterist of the party, as he was the coleopterist, and we both collected such other groups of insects as came in our way. Purely scientific work, or mere collecting, was discouraged, as the party was an "Economic Entomological Expedition," a fact repeated over and over again to the wonder-stricken pioneers of the wilderness.

Our collecting appliances consisted of nets, envelopes, "cyanide" bottles and pill-boxes. Mr. Henshaw and myself each had a cyanide bottle. The collecting was practically done by Mr. Henshaw and myself, as Dr. Hagen was physically unable to enter into it, however much he might have wished to do so. Personally I collected everything in the "cyanide" bottle, *except* lepidoptera. These were transferred direct from the net to envelopes. Mr. Henshaw not only collected everything in the cyanide bottle, but not unfrequently placed his lepidoptera therein when he was out of envelopes, and would hand them to myself out of the bottle when we met. I have an unmistakeable recollection of this fact, and it was for this reason I dubbed it "omnivorous."*

When collecting (I remember especially at Yakima City, where Colias was unusually common), I not only put into a single paper envelope specimens taken "in copula," but also those playing together and taken with the same sweep of the net, so that the fact of being in the same envelope is not proof of copulation, in all cases, so far as I am concerned.

When we reached camp after collecting, I used to prepare and number the lepidoptera first, and then assisted Mr. Henshaw with the beetles and other insects, which were packed "en masse" in pill-boxes, the latter labeled as were the envelopes with the number of the camp.

During the trip there was entire harmony and free discussion between Mr. Henshaw and myself. I believe I am correct in adding that at that time none of the party knew exactly what species of Colias we were collecting.

Now to the gist of the whole matter, which is a question as to the action of cyanide of potassium on the yellows of the genus Colias, and in particular, on one individual specimen of this genus taken during our wanderings in Washington Territory.

Now, although we discussed *Menapia*, *Machaon* and *Leto*,† I never heard of this "cyanide changed Colias" until its discussion in the periodicals. To me it would have been of peculiar interest, as I happened to have suffered severely by the action of cyanide on yellow insects on a former occasion, when in Fresno County I collected several hundred yellow marked hymenoptera in excessively hot weather (the bottle perspiring

* See Papilio, iv., p. 170, for this expression: In Ent. Amer., i., p. 119, Mr. Henshaw seems to object to the word "omnivorous."

† Henshaw, paper before cited.

freely), and had them all transformed to a lot of brilliant red and black forms, mottled with unchanged yellow. Again, if it had been the initiation of a scientific experiment, so keen an observer as Dr. Hagen would surely not have been content with a single experiment, when Colias was common everywhere; but having had his curiosity excited, would have prosecuted the investigation to its legitimate conclusion.

Again, the statement that "the supposed change of color appeared after the specimen was dry," is inconsistent with the action of cyanide of potassium on yellow insects, as the change is palpable while they are wet, if they change at all; and it almost involves the conclusion that the change was not discovered till months afterwards, as the specimen in question must certainly have been "enveloped" the same day, and the envelope remained unopened until it reached the Museum.

In conclusion, I may say that for all scientific purposes this specimen should be ignored as having less than an infinitesimal value. Mr. Henshaw states the case exactly (Entom. Americana, vol. 1, p. 119) when he says: "In regard to the Colias similar in color to *Astraea*, I have only to say that a yellow Colias recognized in the field as closely corresponding to, if not identical with others previously collected, was placed in a damp, freshly prepared cyanide bottle, and when taken from the bottle the hind wings were wet; the specimen was preserved and the facts noted at the express wish of Dr. Hagen." I have never seen Dr. Hagen's original paper, so that I do not know at what point the particular Colias in question was taken, but the accidental breakage of Mr. Henshaw's collecting bottle explains the preparation of a new one; his habit of collecting lepidoptera in the same bottle with beetles explains why the Colias happened to be in the bottle, and it only remains for us to decide what insect went into the bottle, that is, what particular form. Mr. Henshaw says: "Close to if not identical with others previously collected," but as I find in my note-book, "July 4—Took very fine series of Colias (3 forms)," the question is evidently left open. It might have been either one of these or some other. Mr. Henshaw's admission just quoted, with my own additions, give faithfully the history of the "specimen," and show that any scientific deductions based thereon rest on a most unsubstantial foundation.

San Francisco, Dec. 9, 1885.

A MONOGRAPH OF THE APHIDIDÆ, BY JULES LICHTENSTEIN, MONTPELLIER, FRANCE.

BY J. T. MONELL, BONNE TERRE, MO.

Judging by the first volume of this work, which I have lately received, it will prove of great value to American students of this difficult family. The first volume is illustrated by a number of finely colored plates, and Mr. Lichtenstein promises in his preface to use all such funds as he may obtain from subscribers to the work, in illustrating the second volume—thus practically making subscribers a present of the text. While the monograph will deal more particularly with European species, many notes will be given comparing nearly allied American with European forms.

Considering Mr. Lichtenstein's eminence as an Entomologist, and the many years he has devoted to this family, this work can not fail to receive a hearty welcome from the Entomological public.

DESCRIPTION OF A NEW CHALCID, PARASITIC ON MANTIS CAROLINA, SAY.

BY WM. H. ASHMEAD, JACKSONVILLE, FLORIDA.

Sub-fam., TORYMINÆ.

Podagrion Spinola.

PODAGRION MANTIS, n. sp.

♀. Length .15 inch; ovip., .14 inch. Dull metallic green, finely punctate and sparsely covered with short, whitish pubescence; antennæ and legs dull yellow; flagellum brownish above, all coxæ metallic green, sculptured, posterior ones large, tips of feet black. The posterior femora are greatly swollen as in the Chalcidinæ, armed with about eight large teeth, brown at sides but brassy along upper surface, pubescent, tibiæ greatly curved; abdomen metallic green variegated with brown, compressed and shaped as in the ichneumon genus *Ophion;* wings hyaline, veins brown, marginal and post-marginal veins long, stigmal vein short, thick.

Described from one female specimen bred from egg mass of *Mantis carolina* Say. This is an interesting discovery, and the first species of the genus to be described in our fauna.

Dr. Mayr, in "Die Europaischen Torymiden," in a foot note gives the synonymns of this genus as follows:

Podagrion Spinola. Ann. du Museum d'Hist. Nat., xvii., 1811, p. 147.

Palmon Dalman. Vet. ac. Handl., 1825.

Priomerus Walker. Ent. Mag. I., 1833, p. 118.

Bactyrischion Costa. De quib. nov. Ins. Gen., 1857, p. 5, f. 4.

Several species in this genus are known to science, and it is a remarkable fact that the habits of only one species are known, *Podagrion (Palmon) religiosus* Westwood, and that that also should be parasitic on *Mantis* eggs *(Mantis religiosus).*

NOTES ON THE LARVÆ OF HARRISIMEMNA SEXGUTTATA, HARR.

BY CHARLES F. GOODHUE, WEBSTER, N. H.

During August and September the larvæ of this fine moth are often seen feeding on the lilac. When full grown it is of peculiar shape and markings, and taken altogether, a hideous looking object, and one which few people besides an entomologist would care to have anything to do with.

Mature larva, 1.75 inches long.

Head and adjoining segment black, segments 3 and 4 yellow with black points, segments 5, 6 and 7 are brown varied with white, and 8, 9 and 10 are white, 11, 12 and 13 are brownish black. It is deeply incised between the segments, and the abdominal feet are long, especially the first two pair. Segments 6 and 12 are much produced dorsally, being very pointed; this, together with the habit of arching the body between the anterior feet and the long abdominal ones, causes it to present a very irregular and jagged outline.

On the top of all the segments are a few rather long scattering hairs. It has the peculiarity of retaining the cast off skin of the head and part of second segment on these hairs, which are not shed with the rest of the skin; first near the tip of the hairs the head case is small, a little below this is another, and so on. We have quite often seen three of these cast off skins on a larva at one time.

They will, if ever so slightly disturbed, raise the front part of the body back to the abdominal feet, and thresh it violently from side to side; in fact, their heads shake nearly all the time, like a person with the palsy.

We had often tried to rear the larvæ, but always failed until we discovered the cause. After they were full fed they would rove around the feed box, gnawing a little here and there, but refusing to pupate, and finally died.

A few years ago several larvæ were discovered on a lilac bush where we could watch them daily; when ready to pupate they left the leaves and went down the stalks until they found one that was dead and somewhat decayed; here they bored round holes of the same diameter as their bodies, they wadded the chips up into round balls about the size of B. shot, as they took them out, and then dropped them to the ground. The holes extended into the stalk horizontally about .25 of an inch, and then down about two inches; when finished it was a perfect woodpecker's hole in miniature. After the holes were made the larvæ entered them, but whether they backed in or went in head first was not observed. It is probable that the former method was adopted, as the holes were so small it is scarcely possible that they could have turned after entering. They covered the opening with a thin parchment like silk, very near the color of the bark on the stalk, so that the place was hardly observable; in a few days the change to pupa takes place, and the moth comes out the next spring. Any one wishing to rear the larva of this moth can readily do so by putting some partly decayed sticks of lilac into the breeding cage. When they are full fed they will make their holes in the sticks as readily as when at liberty.

CORRESPONDENCE.

EXPLANATION.

Dear Sir: In reference to an article by the Rev. Geo. W. Taylor, of Vancouver Island, in the December No. (1885) of the ENTOMOLOGIST, a few words in explanation of my connection with the matter seem to be in place.

In looking over the collection he sent me, in the usual way for identification, I noted several species new to me, and I believed new to science. This opinion was shared in by the Toronto Entomologists to whom I showed them. Being in correspondence with M. L'Abbe Provancher, and believing him to be the best American authority on Northern Hymenoptera, I mailed the lot to him, except about twenty species, about the identity of which there could be no doubt. In a short time the box was

returned with a list of identifications and an explanatory note, in which the species found to be new were mentioned, with a statement that descriptions would appear in an early number of the "Naturaliste." The temporary suspension of the periodical doubtless prevented this.

I do not now remember what information I gave as to the collector, but I see from M. L'Abbe's note above referred to that he knew I did not own them, and that I had to return them to Vancouver. And if I remember aright, the box and many of the specimens were labelled with Mr. Taylor's name.

At this time I was compiling a list of Canadian Hymenoptera on which I entered Mr. Taylor's species, those undescribed being credited to Provancher. This list was afterwards incorporated in a check list of Canadian insects published by the Natural History Society of Toronto, in the preface of which Mr. Taylor is credited with a valuable contribution.

Before returning the collection to Mr. Taylor, I submitted it to a meeting of the Natural History Society, with M. L'Abbe's identifications, and read a short paper on the group as compared with Ontario species. This paper I intended to enlarge and publish as soon as M. L'Abbe's descriptions were available. The publication of the list by Mr. Taylor took the matter out of my hands, and I considered I had nothing further to do with it. What material M. L'Abbe had for his descriptions I do not know—doubtless quite ample—but all the Vancouver Island specimens he ever had from me were those sent to me by Mr. Taylor.

W. BRODIE, Toronto, Ont.

Dear Sir: In the CAN. ENT., xvii., p. 243, Mr. C. F. Goodhue describes the larva of *Hemileuca maia* Dru., and refers to the description of the larva in Morris' Synopsis as the only one known to him. The larva has been described and figured by Smith & Abbott, Ins. Ga., pl. 50, figuring the two forms; by Westwood, Ed. Dru., ii., 45; by Harris, Inj. Ins. (Flint Ed.), p. 397; by Morris, Syn., p. 221; by Lintner, 23 Ann. Rep. State Cab. Nat. Hist., 1869, p. 153, giving a very full history; and by Riley, 5th Mo. Rept., 127–133, giving the complete life history with figures of egg masses, larva and imago, and noting very fully all color variations of the larva. *Spirea* seems a new food plant, but both oak and willow are well established as such.

JOHN B. SMITH, National Museum, Washington, D. C.