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Rev. C. J. S. Bethune, M. A., Port Hope, Ont.; E. B. Reed, London, Ont., and G. J. Bowles, Montreal, Que.

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TO OUR READERS.

A happy greeting to all. That the year may bring prosperity in its train to every one of our members is our sincere wish. We enter on our thirteenth year with confidence; long experience of the sincerity of the friendship and heartiness of support of our many friends and contributors in the past, inspires trust for the future—a trust which, we feel sure, will not prove misplaced. We want the cordial support of all to make our journal for 1881 more useful and more widely read than it has ever been before. We hope to hear from all our old friends and many new ones. Please send in your subscriptions promptly to the Secretary.

ENTOMOLOGY FOR BEGINNERS.

BY THE EDITOR.

The Indian Cetonia: Euryomia inda.

This is a stout, hairy beetle (fig. 1) which makes its appearance early in spring, usually towards the end of April or beginning of May, flying about in open fields and about the borders of woods, with a loud buzzing sound, resembling that of a bumble bee. It belongs to the flower beetles, most of whom live on pollen and the honey of flowers, and are fond of sweets.

Fig. 1.

This insect is of a brownish-gray color, dotted and spotted with blackish and thickly covered with short greenish-yellow hairs. It measures half an inch or more in length. During the summer it disappears, but a second brood comes out in the fall, usually during September, when they may be found feeding on the pollen of flowers and also upon the sweet sap of plants and trees. Not content with this, they attack our finest and most luscious fruits, eating their way into the richest ripening pears and burrowing into the finest peaches so deeply that only the tips of their bodies are visible, and in this way spoil-

ing the fruit and inducing rapid decay. They also attack grapes and other sweet fruits.

The Abbot Sphinx: Thyreus Abbotii.

This very pretty Sphinx moth has in the past been very rarely met with in Canada; it seems, however, to be gradually spreading and becoming more common with us. It was first taken some years ago in the neighborhood of Hamilton, and is now reported as quite common there. This season a specimen has been captured in London by Mr. J. M. Denton, the first recorded capture in this neighborhood.

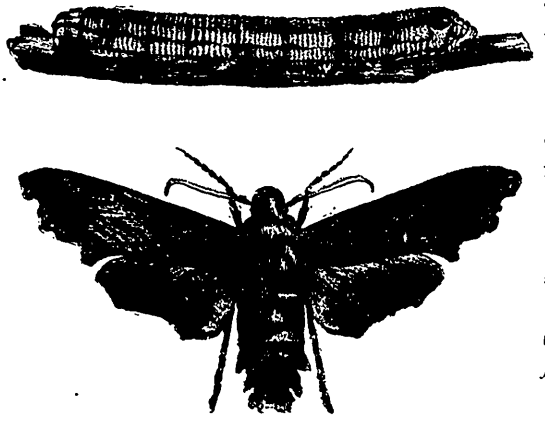

Fig. 2.

The caterpillar (see fig. 2) is found on the grape vine and also on the Virginia creeper (*Ampelopsis quinquefolia*), feeding on the leaves of both these vines. In color it varies from a dirty yellowish to a reddish-brown, marked transversely with fine black lines and longitudinally with patches of dark brown. There is also a dark line along each side. In place of the horn at the hinder extremity of the body which usually adorns the caterpillars belonging to the Sphinx family, there is in this instance nothing more than a polished knob or tubercle. The under side is paler than the upper, with a reddish tinge along the middle. The moth (fig. 2) is very pretty and adorned with soft rich colors. The fore wings are pale brown, variegated with brown of a deeper and richer shade. The hind wings are yellow with a broad blackish border; both wings are notched on the margin. There is but one brood of the moths each year, and they appear about the time the Lilacs are in bloom in the spring.

The winter is passed in the chrysalis state. When the larva is full grown it descends to the ground and constructs a rough cocoon on or near the surface in some sheltered spot, and within this changes to a blackish-brown chrysalis.

OBSERVATIONS ON SEVERAL SPECIES OF AEGERIADÆ INHABITING THE VICINITY OF BUFFALO, N. Y.

BY D. S. KELLICOTT, BUFFALO, N. Y.

In this communication it is my purpose to record such of my observations on some local species of the "clear-wings" as it is deemed are real contributions to our knowledge of the group. I shall say more or less about the following species: *Aegeria tricincta*, *pini* n. s., *pictipes*, *acerni*, *pyri*, *tipuliformis*, *exitiosa* and *Trochilium denudatum*. There are other species known in our fauna, but these only have been encountered in the fields.

Aegeria tricincta Harris.

During June and July last I obtained several examples of this moth from larvæ secured in April. These larvæ were taken from branches, suckers and small trunks of *Populus candicans* growing on low lands along the Niagara below the city. The smaller ones were sometimes found in the sap-wood or just beneath the bark, but the larger ones were generally in the centre or pith of the stems; on the smaller stalks they cause considerable galls, quite as prominent as those upon the willow branches made by the larva of the Tortrix, very abundant in the same locality. These poplars are badly infested by the larvæ of *Saperda moesta*, and I am of the opinion that the moth places her eggs in the deserted burrows of the beetle, the young caterpillars thus easily gaining access to the wood, its home for at least a year. The swellings on the branches caused by the beetle become more enlarged by a second occupation. I have taken them from the stem just above ground, and from limbs of trees many feet high.

The larvæ, when taken, April 15, were of two distinct sizes, the larger measuring from .9 to 1.1 of an inch in length, the smaller .5 of an inch and less. The former appeared to increase but slightly before pupation. The color is dull white with a darker line along the dorsum; head quite strongly bilobed, light brown, jaws and clypeus black; the first ring smooth, slightly clouded with brown, two irregular oblique marks from posterior border outwards to front edge. Body somewhat attenuated toward either end; transverse wrinkles, especially on thoracic rings, well marked; in the small ones there is a slight medio-dorsal indenture; there are also lateral sub-stigmatal wrinkles. Stigmata elliptical, brown, last pair large,

placed sub-dorsally and posteriorly. Above the anal feet, directed backwards, *there are two black chitinous teeth;* in the younger specimens they are more prominent and upturned. The scanty brown hairs arise from slight papillæ.

The larva before transforming prepares a way for final escape which it carefully guards by means of a silken membrane, reinforced by fragments of wood; it then lines its burrow with silk and spins a firm cocoon about itself.

The pupa is light brown. The clypeus is armed with a sharp wedge-shaped process, strengthened by ridges at its four angles and also by a median dorsal ridge. The abdominal rings are furnished, as usual, with two transverse rows of teeth, except the anal and pre-anal segments, which have but one row each. The terminal ring is obliquely truncated, bearing several teeth. Length .6 of an inch.

The moth is described by Harris in Silliman's Journal, Vol. 36, 310, as follows:

"Blue black; fore wings opaque; hind wings transparent, with the border, fringe and transverse line near the middle black; palpi at tip, collar, a spot on each shoulder, and three bands on the abdomen yellow; antennæ short, black; the four posterior tibiæ banded with orange; tarsi yellow tipped with black; tail flat with two longitudinal yellow lines. Expands from 1 to 1⅛ inch."

He says further that "this species seems to come near the European *asiliformis*, but the male has only two abdominal bands, while *asiliformis* male has five."

I am able to add the differences between the sexes and to mention some characteristic marks not referred to above. The male is considerably smaller; the antennæ are strongly pectinated to the apical portion, which is smooth and enlarged to nearly twice the diameter of the middle part; the processes of the joints are hairy with a long fascicle at the apex; the minute apical cone also bears a fascicle of hairs. The antennæ are blue black and scaled above, below pale bay. The abdomen has *four* yellow bands. No "longitudinal yellow lines in the tail." Both sexes have a conspicuous white spot bordering the eye in front; four small yellow spots on the upper part of the thorax; two below the base of fore wings, also a yellow line at the outer edges of the collar; the outer edge of the coxæ of the first pair of legs, also those of the second and third pairs are of the same color. The fore

wings are more or less washed with red on the basal third. The second abdominal band alone appears on the ventral side; in front of it below is a yellow line.

I have not seen the European *asiliformis (bespiformis,* Br. Mus. Lists viii., 14), but have carefully compared our species with the descriptions of Stephens (Haust. vol. 1, 139) and Walker, and find the closest agreement, except perhaps in the coloration of the legs, and in size; *tricincta* is a little larger. Besides, Stephens says *asiliformis* is "occasionally taken on poplars near London in June."

I can not omit mentioning the very close mimicry of *tricincta* after certain wasps; it is so close that different persons to whom it was shown when alive pronounced it a wasp, and this, too, after being cautioned that a hasty conclusion might put reason to the hazard. This close mimicry results from their form and color, in general hue, abdominal bands, thoracic and head markings; also by their motions and attitudes, the buzzing of their wings, the alternate up and down strokes of their antennæ, the position of their wings at rest, their threatening attitude when disturbed, etc. These are often sufficient to deceive even a practiced eye.

AEGERIA PINI, n. s.

When studying the larval habits of *Pinipestis Zimmermani* in 1878–9, I met with the larva and pupa skins of two moths evidently different from the pine pest, yet having quite similar larval habits. During the past summer I succeeded in getting the moth of one of them; it is an Aegerian, as I think, undescribed, but I would not venture upon describing it had I only the imago; but as I am able to give mainly its history, and having done so much tramping and climbing for its sake that I have come to feel a proprietary right, I undertake to name and describe it as new. As its proposed name implies, the larva inhabits the Pine, boring under the bark and into the superficial layers of the wood. From the wounds thus made pitch exudes, which through the action of the larva and the warmth of the sun forms hemispherical masses over its burrows; in these masses the pupa cells are finally prepared and the inactive stage passed. The larva occurs more frequently than elsewhere just below a branch; sometimes about the border of a wound made by the axe or where a limb has been wrenched off by the wind; rarely in the axil of the branch. It appears to attack larger trees than the Zimmerman's pine pest, and more fre-

quently occurs at considerable altitude. I have taken them thirty to forty feet from the ground. While they sometimes, perhaps as a rule, take advantage of the broken cortex, I have found them where it appeared that they had worked through the same into the soft layer.

I have found the larva in the following localities: Hastings Center, N. Y.; Portage, N. Y.; Buffalo, N. Y. (?); Point Abino, Ontario. At the first named place they were found in several instances numerous enough to seriously injure trees of moderate growth.*

I have taken the larvæ in autumn from .25 to .75 of an inch in length; they finally attain a length of 1 to 1.1 inch; diameter quite uniform, .18 of an inch. Color white; head light brown, flattened; first thoracic ring slightly clouded with brown, smooth; no trace of an anal shield; true legs scarcely colored, pro-legs prominent crowned with two rows of about eight hooks each. The brown hairs arise from papillæ, the base of each hair being surrounded by a brown annulation. The spiracles are but slightly elliptical, last pair large, placed sub-dorsally.

Before transforming they prepare a cell in the extruded pitch mingled with their *debris;* this they line with silk, but spin no other cocoon. While in their burrows they move through the soft pitch with impunity, but if removed from the same they soon die from the encumbrance of the hardening pitch adhering to them.

I have found the pupa the last of May; the moth appears from the middle to the end of June. It may be that others come in July and August, for I have found larvæ apparently full grown in July. On the 15th of July I brought to my rooms devoted to the rearing of insects, some blocks of wood containing such apparently mature larvæ, expecting them to complete their transformations in a few weeks at most; they are still in their pitch cells unchanged (Nov.) Is it a case of retarded development due to the drying of the bark and wood?

The pupa has a length of .73 of an inch. Color light brown with the extremities dark. Over the dorsal portion of the abdominal rings are the usual rows of teeth; those on the anterior margins scarcely extend below the spiracles. The clypeus is without a pointed process; the mediodorsal ridge of the thorax is unusually prominent.

* For definite direction to collectors I mention Mallory, a station near Hastings Center, on the Syracuse Northern Railway, where they may be found in force in pines thirty rods south from the station.

When about to transform it bores through the pitch wall and escapes, leaving the pupa skin protruding.

The moth (female) expands 1.2 inch. Fore wings opaque; hind wings transparent. Color blue black as follows: fore wings, the clothed portions of hind wings, head, palpi, thorax, upper part of abdomen, antennæ and legs. The neck fringe and the sides of the collar are orange, also the ventral side of the abdomen and the tail fringes. The antennæ are long, slightly enlarged toward the end; there is a decided orange line on the under side of the antennæ for one-third their length; the tarsi are smoky. The male not seen.

Aegeria pictipes G and R.

I have found this species common enough at Buffalo wherever there are old plum trees. In some instances I have found it doing grave injury. It works also in the cherry trees. Its history has been given recently by Dr. J. S. Bailey (North Am. Ent., I, 17) with so much exactness that any further notice here seems unnecessary. I make mention, however, of finding *pictipes* in the wild black-cherry (*Prunus serotina*) and the wild red-cherry (*P. Pennsylvanica*) in June and July last, at Hastings Center, N. Y. Numerous larvæ and pupæ were taken from beneath the bark; imagines were taken flying about the trunks.

Aegeria acerni Clemens, likewise has been carefully described by Mr. C. V. Riley in the Mo. Ent. Rept., vi., 107. He says, however, that the pupa is unarmed, which is not the case with those obtained here, if "unarmed" refers either to the dorso-abdominal teeth or to the corneous pointed clypeus. The larvæ of this moth are annually doing much damage to the hard maples (*Acer saccharinum*), planted so generally in this city for shade; they are less destructive to the soft maple (*A. rubrum*). It appears that they seldom attack uninjured trees, but depend upon accidents to afford them opportunity to enter the inner bark and superficial wood: when once established they keep at the scar or wound year after year, thus preventing recovery and causing the trunks to become rough and unsightly; in many cases the trees are thus almost ruined. The moths appear most numerously from May 20th to June 15th. I have not been able to find, after patient search, this borer in our forest maples.

Exitiosa and *tipuliformis* are both sufficiently abundant in this vicinity to be destructive to peach tree and currant bush. I have imagines of the former which escaped late in September from chrysalids given me by Mr.

C. D. Zimmerman, so the moth does appear from early summer until autumn. Mr. A. S. Fuller (Am. Ent. vol. 1, N. S., page 11) believes that "the grubs go a much greater distance from their burrows before passing into pupa state than is generally supposed." This from the fact that he found "at various times during the summer in almond trees larvae of all sizes and no pupae." I have rarely found their cocoons at any distance from their burrows, frequently in them covered with gum or bark. From observations on other species it appears that larvae apparently full grown at midsummer may hybernate without changing.

Pyri is a rare form here, so far as ascertained after search and inquiry.

Trochilium denudatum Harris is also rare; June 9th last I found one pupa skin, presumably of this species, protruding from an ash shade tree in this city, but no further evidence of its presence could be obtained. I have one moth taken here June 13th, which is doubtfully referred to this species.

NOTES ON COCCIDÆ.

BY J. HENRY COMSTOCK, WASHINGTON, D. C.

There occurs in certain orange groves in southern California a species of *Aspidiotus* which infests the bark, leaves and fruit of the orange and which from the extent of its ravages has created great alarm. This insect is popularly known by the fruit growers of that section as the red scale, although this name does not well describe its color. This species as yet occurs in only a few of the Californian orange groves, but is more to be feared than any other scale insect. I have conclusive evidence that it was introduced into that State from Australia. It is, I believe, as yet undescribed, and I offer the following diagnosis:

ASPIDIOTUS CITRI, n. sp. *Scale of the female.*—The scale of the female in outline is much flattened, varying in color from a light brownish gray to a bright reddish brown. In fresh specimens there is a white nipple-like prominence which is nearly central and is the remains of a tuft of cottony excretion, beneath which the first larval skin was shed; surrounding this and occupying one third of the diameter of the scale is a

ring which is slightly darker than the remainder of the scale and indicates the position of the second larval moult.

Female.—The female is light yellow in color in the adolescent stages, becoming brownish as it reaches maturity. When fully developed the thorax extends backward in a large rounded lobe on each side, projecting beyond the extremity of the abdomen, giving the body a reniform shape.

Scale of male.—The scale of the male resembles that of the female, excepting that it is only one fourth as large, and the posterior side is prolonged into a flap which is quite thin.

Male.—The male is light yellow; thoracic band brown; eyes purplish black.

The species described by Mr. Ashmead in the November number of the American Entomologist under the name of *Chrysomphalus ficus* Riley MS. is simply a species of *Aspidiotus;* and is not that known as the red scale in California, as is indicated by Mr. Ashmead. Although I have carefully explored many orange groves both in Florida and California, and have had extensive correspondence with orange growers, I have been unable to find *Aspidiotus ficus* in the last named State, and only in a single grove in Florida. Here it was first observed by Mr. G. M. Holmes on some sour orange trees imported from Cuba. On sending specimens of it to a friend at Havana, I received others from that place and the information that it is a very common species in the public gardens of that city. The species can easily be distinguished from *Aspidiotus citri* by an examination of the scale alone, which is much darker, being sometimes almost black.

DESCRIPTION OF THE PREPARATORY STAGES OF PAPILIO PHILENOR, LINN.

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

EGG—Spherical; the surface much covered with a rough crust which rises to a summit, either small and pointed, or rather large and truncated; the sides of this crust irregularly melon-ribbed; color of surface russet, of the crust bright ferruginous. Duration of this stage 7 to 9 days.

YOUNG LARVA—Length .08 inch; cylindrical, thickest anteriorly and tapering from 2 to 13; color ferruginous; marked longitudinally by many rows of low, conical, black tubercles, each of which sends out a black hair, and a few on the side on anterior segments several hairs; of these rows four are dorsal, two being close together on either side of dorsum, and they run from 3 to 13; three are lateral, the upper two being on upper and middle part of side, and running from 5 to 12; the lower, or infra-stigmatal row, from 2 to 12; besides these are two short rows, one of two small tubercles on segments 3 and 4, placed a little below dorsals, the other of three on 2, 3 and 4, between the lines of the upper two long rows; on 2 is a dorsal chitinous band, with five concolored tuberculous points and hairs on each side; feet black, pro-legs red-brown; head obovoid, a little depressed at top, shining black, with many black hairs.

As this stage proceeded a change in the appearance of the larva took place, and shortly before the next moult this reached its height. The tubercles of the two outermost of the dorsal rows became prominent and conical, the tops crowned by the black shields which at first had been at the surface of the body. Seen lengthwise these two rows now formed elevated, sharp ridges. The tubercles of the two inner dorsal rows rose scarcely if any at all, and were almost within the bases of the other rows and stood a little in advance of them. The tubercles of the second short row on 2, 3, 4 became still more prominent, that on 2 especially, and it was turned forward so that its end was even with the front of the head. At same time one tubercle of the upper lateral row, viz., that on 5, and one of middle row, viz., that on 6, also became prominent, and these five all gave out several divergent hairs from their summits; so the remainder of second lateral row gave out three hairs, the other tubercles but one hair each. To first moult from 4 to 9 days according to the season.

After 1st Moult—Length .12 inch, same general shape; color red-brown; at the outer edge of dorsal area on either side, corresponding to outer dorsal row of first stage, is a row of fleshy appendages, one to each segment from 3 to 13; these are thick, tapering, bluntly rounded at top, and from base up are beset with short black hairs; those on 3, 4, 5 are longest, next those on 11 to 13, the others are short; on the lower part of side on 2 to 4 and on 6 is a demi-row of similar appendages, the two anterior ones longer than any dorsal, and the pair on 2 turned forward so that the tips are about even with front of head; on 5, a little above the line above this demi-row, is another but very short tubercle; over the legs

from 7 to 10 and continued to 11 and 12 is another demi-row, all very short and pointing downward; (this arrangement of the appendages continues to last larval stage); the dorsals are reddish, with a fiery glow, the others are color of body; 2 has a chitinous patch with fine tubercles and hairs; under side darker brown; head subcordate, flattened frontally, surface black, shining, much covered with fine and short black hairs. Duration of this stage 3 to 4 days.

After 2nd Moult—Length .22 inch; shape much as before, the segments well rounded, each having one or two vertical depressions on the side; color chocolate-brown, with a reddish tint; the appendages on side of 2 much elongated, measuring .04 inch, and as the stage progresses reaching .08 in.; the dorsals on 3 to 5 and 11 to 13 are longest, subconic; more or less of these dorsals are fiery red, sometimes a single pair, and so to four or five pairs, and the others have a dull red hue; head as before. To next moult 3 to 4 days.

After 3rd Moult—Length .6 inch; color silky black-brown; the dorsal appendages from 5 to 11 are bright red; the front of the ridge on 2 is of same red; the dorsals on 11 and 12 are curved forward; the long side spur on 2 is now .16 inch, tapering and flexible. To next moult 4 to 5 days.

After 4th Moult—Length .8 inch; color now silky-black; as the stage proceeds it changes to dark brown, and loses much of its gloss. At about five days after the moult the larva reaches maturity.

MATURE LARVA—Length at rest 1.6 in., in motion 1.8 inch; color uniform black-brown; shape cylindrical, thickest at 4 and 5; each segment curved, the highest point being in the line of the appendages, or a little back of the middle of the segment; furnished with several rows of fleshy tapering appendages, bluntly rounded at top, and disposed as before described under the first moult; these are mostly concolored with the body, and are thickly beset with short black hairs; the dorsals on 3 to 5 are moderately long, on 11 to 13 long, and the two last are bent forward; the rest are short; from 3 to 10 they are bright yellow or sometimes orange-red; of the anterior demi-row, the one on 2 measures about .34 inch and is slender, tapering, flexible, and is moved much like an antenna; the one on 3 is scarcely half as long as the other, and the two on 4 and 6 are shorter still and equal; on 5 resembles the short dorsals and is colored like them, either yellow or red; those of the posterior and lower demi-row are bent down, and when the larva is at rest have their

extremities even with the claspers; segment 2 is broad, covered dorsally by a chitinous patch which is surrounded mostly by a fleshy ridge; on its anterior side is a yellow or red patch; surface of body smooth, but with one or two vertical creases to each segment and some depressions near the summit; under side brown; feet black, legs brown; head sub-cordate, flattened in front, the depression at top slight, the vertices not being much elevated; color dull black, much covered with short black hairs. At 8 days from 4th moult the larva suspended, and in two days thereafter pupated (in August).

CHRYSALIS—Length 1.1 inch; the abdomen anteriorly very broad, measuring .34 inch; the thoracic segments narrow; bent in a double curve, the head and thorax being thrown back, the abdomen arched and turned down at end; head case much produced, narrow, widening at top, compressed transversely and bevelled roundly and equally to a sharp transverse ridge, the top of which is a little incurved; the sides at top triangular and at the edges ridged; at base of head case on either side is a small pyramidal projection; mesonotum high, rounded, and having on the summit an elevated, three-cornered process, rounded bluntly at top, the sides excavated so as to form three sharp ridges, two across and one, on upper side, in medio-dorsal line; the wing cases flaring, especially on lower half, the middle being depressed; on the abdomen are two sub-dorsal ridges, on each of three segments produced to a high thin circular appendage; on either side of abdomen a low ridge; color variable, being either wood brown, finely veined or reticulated with darker, the ventral side of uniform hue; the top of head case, mesonotum and dorsal side of abdomen being a little yellowish, all the ridges being darker; at base of head case on dorsal side, and along the edges of the wing cases, is a sprinkling of small deep yellow spots and points. Or the general color is green, which prevails over the whole ventral side, the ridges everywhere being of a darker green; the mesonotum yellow-green, and all below to end of abdomen light yellow; a yellow patch at base of head case, which sometimes includes a crimson spot; and sometimes, on either side of mesonotum, is a small round crimson spot. Duration of this stage 15 days.

Philenor is a very common butterfly in this region, to be seen from early spring to frost, in successive broods, and yet I rarely find its caterpillar. Aristolochia, the vine upon which it feeds, is not rare in our forests, but is confined to them. Undoubtedly the caterpillar feeds on

some other plant, as Mr. Mead observed a female ovipositing on the leaves of a slender, low-growing vine in a thicket near my house, some years ago. We neglected at the time to ascertain the name of this vine and I have since been unable to re-discover it, or to find any plant except Aristolochia upon which the larvæ in confinement would feed. Abbot figures Aristolochia *serpentaria* as the food plant of this species, and Dr. Boisduval says the butterfly is found especially where A. *serpentaria* grows. The larvæ feed upon A. *sipho* as readily. An old and very large vine of this species covered the front of the house in which I formerly resided at Newburgh, N. Y., and every year was nearly denuded of its leaves by caterpillars of *Philenor*. How much further north the butterfly lives I am not advised, but to the south and southwest, and on the Pacific coast, it is abundant. So also throughout tropical America and in the West Indies. The eggs are laid in one or two rows of from five to ten in the row, on the under side of the leaves, and are not close together, but separated by narrow spaces. The young larvæ betake themselves to the edge of the leaf, and ranging themselves at right angles to this, side by side, feed after the manner of the large Bombycidæ. No other species of N. American Papilio with whose early stages I am acquainted has this gregarious habit. This continues till they are half grown, when they separate. They are very active in their movements, far more so than any other of our Papilio larvæ, and can travel with great rapidity, and when in motion constantly vibrate their long, flexible, antennæ-like appendages. I have found them somewhat cannibalistic in their propensities, devouring each other at times, when the lack of proper food was not the occasion of it.

I have been in error for several years as to the number of larval moults of *Philenor*, and several times have spoken of the species as exceptional in this respect—as having five moults, when all our other Papilios have but four. And suspecting a mistake, I have taken great care to ascertain the fact the past season. There are but four moults, as hereinbefore described. The figure of the larva of *Philenor* in Abbot is fairly correct, but the chrysalis is much out of drawing. Boisduval and LeConte profess to have figured after Abbot, but the larva cannot have been copied from the Insects of Georgia. It is absurdly wrong. There is no sign of the demi-row of lateral appendages, and the long pair on segment 2, which should form part of this row, appear to come from the dorsum, and look like the prongs of a thorn-locust tree. There is also given a lateral row of red knobs like those on dorsum, and which have

no existence in nature. The chrysalis also is badly done, and instead of the broad bevelled ridge at top of head case, we see a square flat-topped process, much like a wooden plug driven into the head.

NORTH AMERICAN MOTHS.

BY A. R. GROTE.

(Continued from Page 258, vol. xii.)

Graphiphora agrotiformis, n. s.

♀. This form reminds one of *Agrotis collaris* or *versipellis*. Eyes hairy; tibiæ unarmed; tuftings obsolete. Fore wings blackish brown to the continuous, black, upright, uneven subterminal line; beyond with the fringes brownish. Median lines geminate, faint. Orbicular round, paler than the wing; reniform moderate, outwardly excavate, upright, pale-ringed with dark centre; the cell between the spots black-shaded; the stigmata are comparatively small. No trace of the claviform. Hind wings pale brownish fuscous, concolorous; fringes a little lighter and more reddish. Beneath secondaries paler, with discal dot and uneven exterior line; fore wings dark fuscous to terminal space, which is pale with the fringes dark. Head and thorax like the fore wings; collar a little paler. Body rather slender; costa of primaries a little depressed centrally. Colorado; expands 34 mil. Differs from the described species quite strongly; from *Mamestra* by the untufted body parts.

Heliophila oxygala, n. s.

Allied to *pallens*. Fore wings light yellowish ochrey; the interspaces beyond the cell and below the median vein indeterminately shaded with blackish. The veins paler; a small black dot at the end of the cell alongside of the median vein. The outer line reduced to a small black dot on vein 2 and vein 5. Fringes concolorous. Hind wings blackish fuscous, a little paler at base; fringes pale. Beneath both wings shaded with fuscous, leaving the costa of primaries and the fringes pale. Breast shaded with fuscous; thorax and abdomen yellowish ochrey. This species is more yellowish than *pallens*, with the fore wings shaded with

blackish. Eyes hairy; clypeus smooth. Expands 32 mil. Colorado. One specimen in Mr. Tepper's collection, one ♂ in my own.

Under the name *obusta*, I believe that Gueneé has described a form of *pseudargyria* in which the primaries are suffused with *red*.

Heliophila flabilis, *n. s.*

♂. Very pale ochrey or straw color shaded with fuscous. The pale longitudinal shades extend along the cell over the interspace between veins 5 and 6 nearly to the margin; a short pale shade on the interspace above and extending nearer to the margin. From the base a wide submesial pale shading extends outwardly to the margin. A black dot marks the reniform at median vein; an extra-mesial row of dots on the nervules, not prominent. The veins are indistinctly paler. The darkest portion of the wing is along the median vein, and a fine black streak runs along the interspace between veins 4 and 5. Hind wings whitish, vaguely soiled with fuscous exteriorly. Thorax concolorous with primaries; no lines on the collar. Beneath without marks. This species recalls in ornamentation *lapidaria*, but is more diffusely shaded; the outer line of spots more numerous, the hind wings darker, the body more slender. Eyes hairy; clypeus smooth. Long Island, near the sea shore, in May; Mr. Tepper. Expands 33 mil.

Heliophila farcta, *n. s.*

♂. Allied to *adjuta* and *lapidaria*, but much stouter. Fore wings unicolorous pale ochrey with a warm or reddish tinge and without longitudinal shadings. Median vein paler. A dot on vein 2 and one on vein 5 indicate the extra mesial line. A small faint dark shade subterminally about vein 5 opposite the cell. Hind wings white with slightly ochrey fringes; no marks above and beneath. Collar lined. Head and thorax concolorous with primaries; femora darker within. Eyes hairy. Length of primary 19 mil. California, Mr. Hy. Edwards, No. 168.

The following is a list of the North American species of *Tarache* (Acontia), as far as known to me. I have seen the type of *obatra* Morrison; it appeared to me to belong to *Spragueia*. The new variety *virginalis* differs from the type by the absence of the subterminal blackish shading on the primaries.

1. *crustaria* Morrison, Proc. Ac. N. S. Phil., 70, 1875. Colorado; Nebraska.

2. *flavipennis* Grote, Bull. B. S. N. S., 1, 153. California; Oregon.
3. *aprica* Hubn. 371; Guen. Noct. 2, 219; Var. *biplaga* Guen., Noct. 2, 218. Southern States.
4. *abdominalis* Grote, Can. Ent., 9, 157. Texas.
5. *lanceolata* Grote, Can. Ent., 11, 198. Texas.
6. *angustipennis* Grote, Proc. Ac. N. S. Phil., 426, 1875. Texas; Colorado; Calif.
7. *sutrix* Grote, Can. Ent., 12, 154. Colorado; Nevada.
8. *tenuicula* Morrison, Proc. B. S. N. H., 218, 1875. Texas.
9. *erastrioides* Guen., Noct. 2, 218. Canada; Eastern and Middle States.
10. *candefacta* Hubn., Zutr. 587–8. Canada; U. S. east of Rocky Mts.
11. * *debilis* Walk., C. B. M., 786. Texas. Var. praec.?
12. † *arizonae* Hy. Edw., Proc. Cal. Acad. 1878. Arizona. Coll. Hy. Edw.
13. *elegantula* Harvey, Can. Ent, 8, 55; *Tar. semiopaca* Grote, Bull. U. S. Geol. Surv. 4, 182. Montana; Nevada.
14. *binocula* Grote, Can. Ent. 7, 224. Var. *virginalis* Grote. Texas.
15. *cretata* G. & R., Trans. Am. Ent. Soc. 3, 181, pl. 2, fig. 78. Texas.
16. *lactipennis* Harvey, Can. Ent. 7, 135; Bull. B. S. N. S. 3, 10, pl. 2, fig. 3. Texas.
17. *delecta* Walk., C. B. M., 799; *metallica* Grote, Proc. Ent. Soc. Phil. 4, 321, pl. 2, fig. 7. Southern States.
18. *terminimaculata* Grote, Bull. B. S. N. S. 1, 153. Eastern and Middle States.

Staudinger enumerates six species of *Tarache (Acontia)* in the European fauna. As above cited we have eighteen. Of these, two, Nos. 12 and 13, were originally described under *Thalpochares;* one of them I have not been able to examine critically *(Arizonae).* I have seen the type in Mr. Edwards' collection; it is frail and small, in ornamentation recalling *elegantula,* of which I have been able only recently to see the type also in Mr. Edwards' collection. Both these species need neurational study to determine positively their generic location; of *elegantula* I have only a single perfect individual, the type of *semiopaca,* and cannot sacrifice the specimen. Our fauna contains many handsome and noteworthy species. Foremost among these are *delecta,* which resembles the species of *Eudryas* in color and *cretata* and *lactipennis,* which recall *Ciris Wilsonii.*

* From recollection of the type Mr. Walker's *debilis* is a variety of *candefacta.*

† This and the following were described under *Thalpochares.*

Hyblaea puera Fabr.

From a specimen shown me by Mr. Neumoegen as Mr. Strecker's new genus *Aenigma*, with its "very large number of subcostal nervules," I infer that Mr. Strecker has re-described this Fabrician genus and species, which latter is variable and enjoys a wide geographical range. It is also very probable that Mr. Strecker's new "Cosmia" from Florida, described in Proc. A. N. S. Phil., is the typical southern ♀ form of the Bombycid, *Hyparpax aurora.*

Botis dapalis, n. s.

Fore wings with dusky gray median space; the rest of the wing brownish. An arcuate dark brown anterior line; posterior line similarly colored, sinuate, followed by a vivid white shade at costa. A brown dot in the place of the orbicular; a small black streak in the place of the reniform. Terminal space gray. A black dotted line followed by a gray line before the brownish fringes. Hind wings crimson red with a black extra discal mark, the fragment of an extra mesial line. Edge of the wing and internal margin black shaded. Fringes silky, long, brownish, tipped with reddish. Beneath fore wings red with the discal marks repeated and the exterior line, followed by the white costal shade, repeated. Hind wings yellow, shaded with red, with a red discal dot and extra mesial jagged line; a subterminal line marked at costa. Fringes brownish, long, silky, stained with red. Body parts dark brown, paler, reddish beneath; palpi reddish at the sides. *Expanse* 18 mil. California, Mr. Hy. Edwards, No. 3,023. A very distinct species belonging to the *subsequalis* group.

CORRESPONDENCE.

CONCERNING CHRYSOPHANUS NAIS, EDW.

DEAR SIR,—

This species was described from defective and scanty material, brought in from Arizona. As it has recently been taken in numbers in So. Colorado and New Mexico by Mr. B. Neumoegen and others, we are able to see that it belongs to the Erycinidæ, and its habits are reported to be like those of Lemonias Virgulti and allies. I enclosed a pair to Mr. A. G. Butler, British Museum, and he replies 22nd Nov.: "I do not wonder at your describing the little butterfly as a Chrysophanus; it was a most

natural mistake considering that the coloring and pattern are quite like that genus, and quite unlike the members of the genus to which it appears to belong. In structure it agrees best with Apodemia (I might say it agrees altogether), but the pattern of the under surface is not like any member of that genus known to me, being more like the arrangement found in Echenais. If color therefore can be called a structural character, the species belongs to no known genus, but as I do not consider this to be the case, I should certainly refer it to Apodemia."

Coalburgh, W. Va., Dec. 9, 1880. W. H. EDWARDS.

ON HYPHANTRIA TEXTOR.

DEAR SIR,—

Hyphantria textor (Harris) made its appearance in this locality on May 10th, and from that date to the 13th I captured 53 ♂ examples and 10 ♀.

On June 17th the second brood appeared, and in three days I took 41 ♂ and 10 ♀.

Unfortunately, at the time of the appearance of the third brood, it commenced raining, and for two weeks, almost every day or evening, we had heavy showers, nearly exterminating lepidoptera.

In the first brood every male had the black spots on the primaries, from a single spot on each wing to almost covered, and in some examples a spot on the secondaries. In the second brood all were white, not an example with the least trace of a mark, the females in both broods entirely white. I anxiously waited for the third brood, but for reasons above, did not see a single specimen. My object was this :—Has the first brood or that which remains over winter only, the black spots? or does *H. textor* alternate? Will some of your readers please answer the above questions through your valuable journal.

August 3rd, 1880. JAMES S JOHNSON, Frankford, Penn'a.

DEAR SIR,—

In connection with Mr. Fletcher's interesting article on *Calosoma*, I send you my experience of *scrutator*. On 11th June I left Hamilton for Long Point. I had half a day to spend at Port Dover before the boat left. About noon a strong breeze sprung up from the S. W., which drove the waves up the shore. I took a stroll along the beach, and had not gone far when I saw a greenback just landed, making rapid strides with

his long legs away from the water, and I seized my first living *scrutator*. I took several of them that afternoon alive, some of them simply that and nothing more. At Long Point the evidence of what had been was unmistakable; the water lines of various storms of different forces were marked with bands of green wing-covers. I was too late for the harvest, very few coming ashore while I was there. When sugaring for moths we took from 2 to 5 every night, and one night 16. A large gauze-winged fly was attracted in great numbers to the sugar, and the *scrutator* was attracted by them, for in almost every instance we took them with one of these in their jaws. When seized they would drench the fingers with an acrid fluid of the most offensive odor; it was very volatile, drying rapidly with a sensation like alcohol. In one instance I took one from under a board on the beach, and in blowing off the sand that adhered to it some of the fluid struck my lip; it burned for an instant sharply. The odor from them leaves in a very short time. Does it not seem strange they should remain so scarce in the country when they are landed in such numbers on our shores alive? A friend, Mr. A. H. Kilman, of Ridgeway, writes me that they came ashore this spring after a south-west storm in hundreds, dead and alive. And we may suppose it to be about the same along the whole north shore of Lake Erie, and yet I know of but three taken in the neighborhood of Hamilton in 20 years. J. ALSTON MOFFAT.

Hamilton, Ont., July 9th, 1880.

ARBOREAL AUSCULTATION.

DEAR SIR,—

Some time ago, while visiting the Dean and Williams Gold Mine, in the township of Marmora, I was interested in observing the proceedings of some woodpeckers which resorted to some half-dead pine trees in front of my room window. I remarked that after alighting they would run upwards in a zigzag way, stopping occasionally, and applying the side of their heads to the tree, evidently listening for the noise made by a grub while gnawing the wood. Suddenly a bird would begin to dig into the bark, the rapid strokes of its powerful bill making the chips fly faster than a lumberman's axe. On one occasion, by the aid of an opera-glass, I saw one fellow transfer something large and white from the cavity he had excavated to the interior of his craw, but the quickness of the action prevented me from ascertaining precisely what it was.

Thinking of this, it has occurred to me that the presence of a

"borer" in a fruit or other tree might be ascertained in the same manner by the use of a tube of wood or tin-plate formed like a stethoscope or ear-trumpet; by applying the wide end to the tree and the small end to the ear, the exact locality of the grub could be determined, when the application of a stout brad-awl or small gimlet would put an end at once to his life and his depredations without material injury to the tree.

JAMES T. BELL.

NOTE ON CHRYSOMELA JUNCTA, C. 10-LINEATA AND CARYOBORUS ARTHRITICUS.

DEAR SIR,—

During last Aug. and Sept. *Chrysomela juncta* has been more abundant than I have ever before seen it in this vicinity, and with larvæ was feeding on the leaves of *Solanum carolinense*, in company with *Chrysomela 10-lineata* and *larvæ*. The larva of *juncta* differs from *10-lineata* in being stouter and with the head larger. The color is dirty white. They are readily distinguishable apart. I took in the sexual act a male of *juncta* and female of *10-lineata*, and Mr. Siewers, of Newport, also observed the two species in intercourse. In the neighboring potato fields were thousands of *10-lineata*, but no *juncta*. Specimens killed in cyanide and pinned immediately after death all turned black in drying; to get a few good specimens I flexed the abdomen down, cut an incision along the top and removed the soft parts, put in a amall quantity of arsenic and filled the cavity with cotton—getting as a result bright and beautiful specimens.

A friend in Fla. writes, saying: "I send a box of seed of the 'Cabbage' tree. I gathered them and put them away, and when I opened the box I found a bug in every seed. What are they?" The seeds, about 100, are of the *Sabal* palmetto; out of the entire lot only two or three did not contain a beetle, *Caryoborus arthriticus* Fab. The entire inside portion of the seed being eaten out and the insect filling the cavity, a round cap had been formed—by the larva, perhaps, cutting a ring through to the external skin of the seed on the inside, leaving it so that a push would burst it outward. The cap was in many cases burst off, and in all cases the insect was presented towards the opening tail foremost; all were dead. Is this one of the uses of the powerful posterior legs of this species, to burst the skin of the seed and thus get out?

CHAS. DURY, Avondale, Ham. Co., O.