Pamphila Taxilis, Edw. "Comma v. Colorado, Scud.

- " " v. Nevada Scud.
- " Snowi, Edw.
- " Phylæus, Dru.
- " Deva, Edw.
- " Python, Edw.
- " Pittacus, Edw.
- " Nereus, Edw.

Amblyscirtes Ænus, Edw. "Nanno, Edw.

- Pyrgus Tessellata, Scud. "Scriptura, Bd.
- Thanaos Brizo., Bd.
 - " Icelus, Lintn.
 - " Aucopius Lin
 - " Ausonius, Lintn." Propertius, Lintn.
 - " Pacuvius, Lintn.

- Thanaos Afranius, Lintn
 - " Tatius, Edw.
 - " Clitus, Edw.
 - " Funeralis, Lintn.
- Pholisora Catullus, Cram.
 - " Pirus, Edw.
 - Alpheus, Edw.
 - " Ceos, Edw.
- Eudamus Pylades, Scud.
 - " Nevada, Scud.
 - " Moschus, Edw.
 - " Epigena, Butl." Hippalus, Edw.
 - " Cellus Bd
 - " Cellus, Bd.
 - " Tityrus, Fab. " Dorus, Edw.

Pyrrhopyga Araxes, Hew.

DESCRIPTIONS OF NOCTUID LARVÆ FOUND ON CUTTS' ISLAND, MAINE.

BY ROLAND THAXTER;

PSEUDOTHYATIRA CYMATOPHOROIDES. Guen.

Rich yellow-brown, varying in shade, mottled by fine dark lines. A contrasting white spot just above the stigmata of seg. 4, roundish and varying in size, sometimes altogether wanting. A fine, continuous black dorsal line. Head protruded and darker brown than the body. Stigmata black-brown, slender. L. 42 m. m. Three specimens found in cases between leaves, such as are made by *Charadra*. When at rest the body is bent, the head approaching the posterior segments. Spun a slight cocoon in moss September 20-25. Imago June 9 P. M.

Three specimens on red oak.

HABROSYNE SCRIPTA. Gosse.

Eggs somewhat pear-shaped, white, changing to bright pink after a day or so of exposure to the air, deposited transversely, singly or superposed in chains of five or six, on the margins or ribs only of raspberry leaves, July 21. A number of hair-like scales are also deposited with the eggs.

Mature larva.—Rich yellow-brown, often almost black. A distinct dorsal black line. Lateral portions more yellow, with blackish mottlings, and broken by blackish dashes which extend from the dorsal portions anteriorly and inferiorly, becoming pointed about the stigmata, where they end. Dorsal surface generally much darker than the rest of the body, though subject to considerable variation. In a few specimens one, two or even three white spots were present above and somewhat anterior to the stigmata on the fourth, fifth or sixth segments respectively; each spot having a central black dot. In some specimens a white spot was present just below the stigmata of seg. 3, also a smaller lateral spot on seg. 1. Segments 2 and 3 are somewhat larger, and seg. I somewhat smaller than the rest. Head yellow-mottled with dark brown, the mottling contrasting. Beneath, dirty yellow, smooth, cylindrical, tapering posteriorly. Head prominent, moderate. Cocoon in moss, very slight, August 27, Pupa legs, I. When at rest the larva rests either like a Notodontian, the anterior and posterior portions of the body being elevated, or bent so that the head rests upon the posterior segments. When not feeding the larva conceals itself in a case formed by curling down the edge of a leaf, as in the preceding species. Length 30 m. m.

I was unable to observe the early stages and only noted that the first was pinkish, without marks, and that in the stage before the last moult the larva closely resembled *Notodonta stragula* in its early moults.

PLATYCERURA FURCILLA. Pack.

Mr. Lintner has described the more common brown form of this larva in his Entomological Contributions, and the following is a description of a second form, which differs so markedly from that described by Mr. Lintner that I have, until very recently, considered it to belong to another species. Imagos, however, reared last summer from both forms show no constant variation.

The normal form is light chestnut-brown, with tufts of hair of the same color, the larger pencils on segs. I, 2, 4, 11, deep chestnut, tipped with black. In the present dimorphic form the color is glossy black, growing dull and tinged with green, as the larva matures. Sparsely clothed with tufts of white hairs of about twelve tufts on each segment, except the first and last. These tufts are small and the hairs are of irregular length. segs. I, 2, 4, II are set pairs of sub-dorsal tufts, as in the normal form, but clear white or tinged with olive. There is a lateral row of whitish spots extending superiorly and anteriorly just below the stigmata, which are greenish-white. Otherwise the larva is without marks. Head shining black, clothed with a few hairs and with two indistinct whitish frontal streaks. Legs and prolegs light brown, moderately short, tapering posteriorly. Rests extended on a twig, with the head drawn down so that its frontal surface is parallel to the twig. Spins a double cocoon much like Charadra, in September (9th to 25th), the imago appearing in June and July. Feeds on white pine.

A similar larva was found on Linden, September 15, indicating a great variety in the food plant. The larva, when young, fed only upon the margins of the leaves.

CHARADRA DERIDENS. Guen.

Eggs on red oak July 4, flattened, ribbed, whitish, deposited singly or in rows on under side of leaf. Hatched July 11.

Young larva. Light green. On segments 2, 3, 4, 5, 6, respectively, a large, roundish, red sub-dorsal spot. Head large, tinged with brown. Body tapering considerably posteriorly and sparingly clothed with long colorless hairs. L. 2.5 m. m.

After 1st moult, July 14. Color light green, white externally. The red spots much darker, smaller anteriorly. A white dorsal line, with indications of sub-dorsal ones. Hairs on segs. 1, 10, 11 longer than the rest. L. 5 m. m.

After 2d moult, July 19. Color as before. Dorsal, subdorsal and two lateral white lines. The red spots, dark winecolored, and replaced on segs. 2 and 3 by tufts of short blackish hairs somewhat below the sub-dorsal line. Several long black hairs on segment 1, which protrudes laterally beyond the head. L. 8 m. m.

After 3d moult, July 23. Bluish green. Lines more distinct. The spots on 4, 5 and 6 smaller and blackish. Hairs composing the dorsal tufts, except those on seg. I, IO and II short; lateral tufts long (this applies to all stages). A lateral tuft of iong black hairs on seg. I. Head straw colored, edged externally with black, having a broad posterior black band from which two fine black lines diverge to the jaws. Legs and prolegs bluishgreen. L. II m. m.

After 4th moult, July 26th. Very light bluish-green. Subdorsal spots minute. Head variously marked with black, lightgreen or straw color. Else as in the two preceding stages.

L. 18 m. m.

After 5th moult, July 30. Much as before; the sub-dorsal spots hardly visible. In some specimens large suffused dorsal, dirty blackish patches.

After 6th and last moult, August 6. Every variety of color from clear blue-green to black or dirty brown. Sub-dorsal spots absent. Longitudinal streaks indistinct. Tufting as before; hairs slender, not stiff, white. A few lateral black hairs on seg. I. Head variously marked from shining black with a few straw colored frontal spots to light straw color. L. 40-60 m. m. Cocoon August 15.

Concealed in a case between two leaves. Rests with the body unbent. The same larva was found on birch and elm. The mature larva has been described by Mr. Sanders in Can. Ent., Vol. I.

The larva of *C. propinquilinea*, which feeds on birch, walnut, maple and oak, is subject to a somewhat similar variation. One specimen found on maple at Mt. Desert, Me., was black, with a dorsal white band, and a lateral white band edged below with black. Beneath white. The long tufts on seg. 2 were clear black instead of red as normally. Other specimens on walnut were mottled with black.

C. deridens spins a close outer cocoon of fine pinkish silk and a coarse inner cocoon of brown silk. Imago in June and July. RAPHIA FRATER. Grote.

Color generally dark, somewhat bluish-green, though subject to considerable variation of tint. Body covered with scattered bright yellow points, about twenty on each segment. A dorsal hump on seg. 2 surmounted by two short, blunt red prominences. On the dorsal surface of segs. 4, 8, 11 is a transverse mottled redpurple transverse band, interrupted centrally and somewhat crescent-shaped, which is bordered posteriorly and externally with more or less clear yellow. A lateral red point on segs. I and 2. Legs and prolegs light green, anal pair tipped with red. Head rather large, bluish-green, with minute lateral black point. L. 40 m. m.

Form very stout, tapering somewhat posteriorly and ending abruptly. Rests on the midrib on the underside of poplar leaves. Varies considerably in size, the males being much smaller and more slender than the females.

Spun a stout blackish cocoon on bark September 10. Imago June 10.

It is this larva or its ally, *R. abrupta*, that is figured in Harris' Correspondence, pl. I, fig. 6. as "*Notodonta* sp., found under maple."

APATELA MORULA. G. & R.

Eggs on elm, July 6. Very small, much flattened, whitish. Hatched July 12.

Young larva.—Dirty greenish-white, without marks. A few white hairs, a sub-dorsal row black. Head tinged with brown.

After 1st moult, July 15. Light green. Legs and setiferous tubercles white. A sub-dorsal white band. A few anterior and posterior hairs very long. Head light green, with a few longitudinal dark streaks. L. 2.5 m. m.

After 2d moult, July 19. Brighter green. Sub-dorsal band more distinct, interrupted on segs. I and 10. A transverse median dorsal red band on segs. 4, 7, 11. Form more tapering abruptly anteriorly and gradually posteriorly from segs. 3 and 4. L. 6 m. m.

After 3d moult, July 22. Clear, light pea-green. A subdorsal yellow band growing faint on segs. 9 and 10. A conspicuous mottled dark red-brown dorsal patch on segs. 4, 7, 11, edged posteriorly and externally with yellow. A fine lateral white line. Two small dorsal reddish patches on seg. 1. Setiferous tubercles yellowish, bearing a few long whitish hairs. Head green anteriorly, mottled reddish posteriorly. Legs and prolegs green. L. 10 m. m.

After 4th moult, July 26. Dark yellow-green above, bluegreen below. Colors brighter than in the preceding stage. Lateral line broken and inconspicuous, otherwise as in the preceding stage. L. 18 m. m. After 5th moult, July 29. Colors more intense, the yellow and red of the dorsal spots contrasting strongly. In a few specimens seg. 8 has in all the above stages a dorsal spot less con spicuous than the rest, otherwise as in 5th stage. L. 30 m. m.

After 6th and last moult, August 2 (Mature larva). General color mottled-brown and greenish like bark. A dorsal black band contracted between each segment, containing a central dorsal white line. On segs. 4, 7, 8 this band forms a transverse dorsal hump edged with deep black and set with a few short white hairs. Above and below the stigmata are white, setiferous tubercles bearing whitish hairs. Segs. 1, 2 and 3 are set with tubercles bearing longer hairs than the others, which are directed anteriorly. A diagonal black mark suffused on segs. 1, 2, 3 runs superiorly and posteriorly just above the stigmata. Stigmata black, ringed with white. Head black anteriorly, dull carmine or orange posteriorly, with a central, arrow-shaped light brownish mark, and with several lateral whitish streaks. Legs greenish. Prolegs black. Beneath dirty greenish. L. 50 m. m.

This last moult is somewhat interesting, as with its change of color a corresponding change of habit supervenes and the larva, instead of resting on the upper surface of the leaves on which it spins a slight web, as in the preceding stages, betakes itself to the crevices of the bark, when it becomes almost invisible.

The black and brown tints do not appear immediately after the last moult and the larva differs little from the preceding stage till it has been exposed to the air for some time, the dark tints gradually appearing after several days. The same is the case in *A. furcifera* and *lobeliæ* and also in *Thyreus abbotii*, the early stages of all these being adapted to leaves, the last to bark.

In their early stages the larvæ of *A. morula, furcifera, Radcliffii*, and *clarescens* can hardly be distinguished at a glance, and all, except the last species, produce striking changes of color after the last moult.

The cocoon of *morula* is spun under loose bark or in the crevices, and can often be found on the trunks of old elms, though I have found the moth somewhat rare. The present brood began to spin August 9, producing a single imago September 7. The remaining cocoons will hybernate. The moth appears in June and July. The same larva was found on linden September 15.

APATELA VULPINA. Grote.

Before last moult. Body greenish-white, darker inferiorly, thickly clothed with long white hairs, slightly tinged with yellow. A jet black, rather short, thick black tuft on the median dorsal portion of segs. 4, 6, 7, 8 and 11. Head light greenish with a black dot on the frontal portion, each side of the median line, also two inferior black spots. Legs light green, prolegs banded with black. L. 30 m. m.

Mature larva.—Body light bluish-green, whitish above, immaculate and without any black dorsal tufts. Thickly covered with tufts of long, curved yellowish-white hairs. A few short black hairs on 11 and 12. Head large, dirty-whitish, with a few darker mottlings, and two inferior black spots on either side. Stigmata yellow. L. 45.

Entered the earth September 9, where it spun a slight cocoon, changing to a somewhat slender olive-tinted pupa. Imago June 26, 11.30 A. M.

The long curved hairs give this larva a very curious appearance when at rest on the under side of a leaf, with its body curved about so as to form what appears to be an oval mass of down that is readily mistaken for a nest of spiders' eggs. The curved hairs seem to come to a sort of focus in the region of segment 9, which is very characteristic. Before entering the ground the body becomes dirty brownish-green, the hairs become dirty yellow, the head entirely black, without marks. Found on poplar and birch. This is the only species of Apatela, as far as I know, the larva of which enters the earth to spin its cocoon. A second specimen, to which no earth was given after it had changed its color preliminary to transforming, refused to spin a cocoon with bits of bark and other substances furnished for the purpose, and finally died, as it seems, for lack of earth to enter. This larva resembles very closely, in both the stages above described, the corresponding stages of the European Apatela leporina, but the mature larva of vulpina differs by the absence of any dorsal marks and, probably, in some other points. The pure white color of the imago is, doubtless, protective, and connected with the white color of the bark of its second food plant.

APATELA NOCTIVAGA. Grote.

Eggs on poplar, July 14. Hatched July 9. Young larva. Color greenish-white. Dorsal portions of segs. 1, 4, 7, 8 and 11 red; the rest more or less tinged with red. Sparsely clothed with long blackish hairs. Beneath greenish-white. Head brown, rather stout, not tapering. L. 3 m. m.

After 1st moult, July 12. Color dirty greenish. Segmentation very distinctly marked. Dorsal patches dull reddish on superior portion, the other segments (except 9 and 10) suffused with red. Head dirty red, greenish anteriorly. Somewhat thickly covered with tufts of stout black hairs. L. 5.5 m. m.

After 2d moult, July 12. Much darker than before, the red colors having become dark wine-color, somewhat mottled, and being suffused over the dorsal portion of all the segments, except 9 and 10. Sub-lateral and ventral portions light green, except on segs. 1, 2 and 3, which are tinged with red. A whitish lateral line. Body covered with black setiferous warts, on which are set thick tufts of short stout black hairs, those on seg. 10 much shorter than the rest. Legs green, edged with red. Prolegs banded, green and red. Head dark blackish, mottled, tapering gradually posteriorly and suddenly anteriorly from seg. 11. L. 8 m. m.

After 3d moult, July 20. Dull black above, yellowish beneath. A yellowish lateral line. Two yellowish dorsal patches on seg. 10, on which the hairs are short. Head blackish, with an anterior yellowish V-shaped mark. Legs greenish-yellow. Prolegs blackish. Seg. 11 much hunched. Form stout, much hunched in the region of segs. 2-4. L. 10 m. m.

After 4th moult, July 24. Black above, deeper anteriorly. A distinct yellow lateral band beginning on seg. 4 and running just below the stigmata, which are white, contrasting. Feet yellow. Prolegs black. Dorsal patches on 10 brighter, otherwise as in preceding stage. In some specimens the tufts on the segs. posterior to 3 and anterior to 11 are light smoky-brown, this peculiarity continuing through the last stage. (A similar variety occurs in the case of *A. luteicoma*, *Grote.*) L. 13 m. m.

After 5th moult, July 28. Lateral band orange colored. A broken yellowish stripe at base of legs. Two dorsal orange spots on 10, and in some specimens two smaller spots on 9. L. 19 m. m.

After 5th and last moult, August I. Much as before, the setiferous tubercles large and rough, jet black, bearing thick tufts of short, stiff black hairs. Lateral band and dorsal spots dark red. Head and prolegs shining black. (Form as in *A. brumosa*, *Guen.*) L. 30 m. m. Cocoon between leaves August 9. Imago in May and June.

Although the moth is by no means rare, I have never before seen this larva during ten years collecting, although from its habits and color it is very conspicuous when feeding.

APATELA LUTEICOMA. G. & R.

Mature larva.—Blackish, with a reddish lateral band, as in the preceding species, though less distinct. Head shining black, with a few whitish hairs. Prolegs black. The tufting is somewhat peculiar. From the dorsal portion of 4 and placed transversely, project four very thick, smoky-black tufts of fine hair, and externally to these is a small, clear white tuft of similar hair. From the dorsal portion of seg 11, which is much hunched, project two long tufts of similar black hairs and externally to these are placed two white tufts, one on each side, as on seg. 4. On seg. 5 are six tufts, placed transversely on the dorsal surface, of similar fine white hairs. On seg. 3 are four similar tufts and also one each (sub-dorsal) on segs. 8 and 9. The four dorsal tufts of 2 also have a few of the fine white hairs at their bases. All the tufts above mentioned have a few longer, coarse black hairs mingled with the finer ones. On segs. 6-10, inclusive, four reddish tubercles placed transversely on the dorsal surface from the edges of which project a few short whitish hairs, and from the central portions a few stout, short black hairs. There are two similar tufts on the anal segment. The remaining tufts are composed of long whitish hairs, very thickly set on the anterior segments and projecting forwards over head on seg. I. Form stout, shape much as in the preceding species. L. 40 m. m. Cocoon between leaves or in rotten bark. Found in September on apple, cherry, walnut, oak, linden and ash. Easily recognized by the peculiar tufts. Rests by day on the trunk of its food plant.

APATELA AFFLICTA. Grote.

Mature larva. Light yellow-brown, tinged with green, darker superiorly. A few lateral whitish hairs. Stigmata white, ringed with black. A whitish stigmatal line; a distinct, continuous black dorsal line. A sub-dorsal row of stiff club-shaped hairs, such as are found in the larva of A. funeralis, but much smaller and not noticeable. These are easily broken and in the specimen before me are present only on segs. 4, 5, 6 and 11, though in more perfect specimens they may occur on all the segments. One specimen found was rich yellow-green, and all vary considerably in shade. Head yellow-brown, lighter externally, sparsely clothed with whitish hairs. Form stout, flattened posteriorly. Rests with head touching the posterior segments, selecting a withered or discolored leaf on which it is well concealed. Cocoon stout, elongated, spun among bark. Several specimens on red oak. Cocoon also under walnut. Spun September 17-25. Imago, June and July.

Of the species of *Apatela*, I am familiar with the larva of the following:

Vinnula, occidentalis and morula on elm; lobeliæ on oak; furcifera on wild cherry; Radcliffei on wild cherry and apple; funeralis on hickory; vulpina on poplar and birch; Americana, maple, oak, walnut, linden, ash, sycamore; dactylina, alder and willow; luteicoma, linden, ash, maple, cherry, apple, walnut, oak; brumosa, birch, willow, poplar; noctivaga, poplar; afflicta, oak, hickory (?); clarescens, apple, cherry; hamamelis, oak, chestnut; xyliniformus birch, blackberry; oblinita, button bush and various meadow plants; lanceolaria, a green larva, probably eating weeds, such as plantain, etc., found under a board at Cp. Neddock.

MAMESTRA GRANDIS. Led.

Mature larva.—Dull purplish, with obscure black and white mottling. Dull greenish ventrally. A broad, ill-defined light lateral band; an obscure dorsal streak and sub-dorsal lines. Four dorsal black spots on each segment, except 1-3 the anterior pair being more closely approximated than the posterior. A dark anterior shield on seg. 1 as in *Hadena*. Head light shining brown, somewhat mottled. Legs and prolegs dull greenish, the latter tipped with brown. A few short yellowish hairs on head and body. L. 40 m. m. From eggs laid on burdock in July. Entered earth August 19.

PLUSIA CONTEXTA. Grote.

Eggs on grass, July 10. Somewhat flattened, much larger than those of *precationis*, *ampla* and similar species, somewhat flattened, greenish-yellow. Hatched July 16.

Young larva —Light grass-green, on each segment are two transverse rows of large black warts, those of one row alternating with those of the other. From each of these warts projects a stout, curved black hair. Head light brown, mottled with black, and with a few black setiferous warts. Prolegs blackish, very slender. L. 4.5 m. m.

Before preparing for the first moult a row of dull scarlet spots appear, anterior to and including the sub-dorsal row of setiferous tubercles on all the segments, except I and II.

After 1st moult, July 20. Color as before. A white lateral and faint sub-lateral streak. Setiferous warts less distinct. Head with a few black setiferous tubercles. The red spots appeared as before, though less distinct. L. 9 m. m.

After 2d moult, July 20. Darker green. Two dorsal and one sub-dorsal white streak. A clear lateral white band. Setiferous tubercles less distinct, neither they nor the hairs they bear seem to increase after the first stage. Red spots before moulting scarcely visible. L. 14 m. m.

After 3d moult, July 25. Lateral band distinct creamcolored. Two dorsal and and two sub-dorsal whitish streaks. The setiferous tubercles very small, only those on the head, the first three segments, together with a row situated just above the lateral line, are black. A semi-circular lateral row of black spots on head. L. 26 m. m.

After 4th moult, July 28. Lateral band more yellow. Dorsal ones more distinct. Indications of suffused dorsal yellow patches. Else as before. L. 30 m. m.

After 5th moult, July 31. Mature larva. Color light grass-green, darker inferiorly. A contrasting, creamy-yellow lateral band. Two dorsal and two sub-dorsal cream-colored lines, the former more distinct. A dull yellow, suffused dorsal patch, more or less distinct in different specimens, sometimes wanting on posterior 7 and anterior 8, extending nearly to the lateral line. A similar suffused spot is sometimes found on seg. 9, 10. Head green, with a few minute points and hairs. Slender, somewhat flattened. L. 45 m. m. Spun a slender, elongated white cocoon, pointed at both ends, August 4, changing to a pupa August 6, and producing the imago August 17, a period of thirty-eight days and a few hours, the eggs having been laid during the evening of July 10.

A brood of *Plusia Putnami*, *ampla* and *Epigæa* were brought through the third moult, but all died before completing the fourth moult, except a few Putnami, which, at this stage could not be distinguished from *contexta*, unless, perhaps, by a slight, blackish dorsal shade. Their death seemed to be the result of two causesbleeding through the rupture of the integument while shedding the skin, probably the result of too much moisture, and blackening, probably caused by some fungus. I have been somewhat troubled by entomophthrous fungi in rearing moths, especially by a species of Entomophthura allied to radicans, which attacks hairy caterpillars with great rapidity while feeding. Another mold has recently almost wholly destroyed a brood of Ichthyura, portions of the body blacking and producing a white mycelium, while the larvæ were still living, though unable to eat. I have not met with the species of Torrubia, except in the supposed conidial form. In addition to these I have found several species of Mucor and Penicillium very destructive among winter pupæ.

Of the Plusia above described, about ten imagos were obtained from a brood of several hundred. There are probably three or four broods of this species in a season, though there is little or no regularity in the appearance of the imago, as both this species and *Putnami* may be met with at any time from June to the middle of September. It is probable that a portion at least of the July broods of Plusia hibernate with the August and September broods, as the only survivor of my brood of *aimpla* became torpid after the fourth moult and continued in this condition till the first of October, when it died. The following is a list of the species of Plusia that I have taken in this locality. P. *purpurigera, æreoides, ærea, balluca, contexta, Putnami, formosa, mappa* (Isles of Shoals) biloba, verruca, Dyaus, precationis, laticlavia, u. aureum (?), 8-scripta, viridisignata, oxygramma, mortuorum, epigaea, ampla, simplex.

NOTES ON THE GENUS CLISIOCAMPA.

BY R. H. STRETCH.

When at Astoria, Oregon, on the 17th of June last, I found the larvæ of two species of *Clisiocampa* infesting the orchards at that place, one of them excessively abundant the other in much smaller numbers. As we were traveling very rapidly and I had no opportunity for a week to examine and feed the larvæ I only succeeded in raising one of the species, and of that but few perfect specimens. I here give such notes as I have of their transformations.

Larva No. 1.—Similar to that of C. Californica in size and general appearance, but strikingly brighter colored. Length $1\frac{1}{4}$ to $1\frac{3}{4}$ inches. Dark brownish-black. Prolegs black; abdominal



Thaxter, Roland. 1883. "Descriptions of Noctuid larvae found on Cutts' Island, Maine." *Papilio* 3(1), 10–19.

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