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The Canadian Entomologist.

VOL. IX.

LONDON, ONT., AUGUST, 1877.

No. 8

ON THE PREPARATORY STAGES OF SATYRUS NEPHELE.

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

I have tried for several years past to raise larvæ of *Satyrus nephelæ* to maturity, but met with no success till this last spring. It is very easy to obtain the eggs by confining the female with a tuft of grass. I tied a gauze bag on such a tuft set in a flower pot, while in the Catskills, and 21st August, 1876, obtained perhaps fifty eggs. Some were laid on the blades and stems of the grass, but many were dropped loose on the ground. The eggs hatched about the 21st of September, and the young larvæ without feeding entered upon their hybernation. I brought them to Coalburgh and transferred them to grass set in a pot. They were not so sound asleep but that they were able to attach themselves to the stems. The plant was placed in as cool a room as I could give it, and allowed to die, the larvæ remaining on the dried stems. On 29th Jan'y I found that about one-third of the larvæ were still alive, and I placed them on fresh grass in the greenhouse. These were feeding 1st February, as I could see by the bits cut from the edges of the leaves. The color of the newly hatched larvæ was carnation, marked by horizontal carmine lines, but very soon after beginning to feed they turned to pale green, and the stripes changed from red to a green darker than the ground. The appearance of the larva at this first stage is very singular, owing to the long curved bristles which arm the back and sides, giving a general resemblance to a fish bone. The 1st moult was passed 26th Feb'y and next following days. The 2nd on 21st March; the 3rd, 3rd April; the 4th, 18th April; the first chrysalis formed 16th May, and the butterfly emerged 30th May. The stages were unusually long, but I find that characteristic of all species of *Satyridae* that I have bred. And the larvæ are sluggish, moving very little and

slowly. In their general appearance after the first stage—in shape of body and head, and the form of the second segment—and in their habits, the larvae of some of the species resemble the larvae of *Hesperiidae* closely, and there is a marked likeness between some of the *Satyrid* and *Hesperiid* chrysalids. The coloration in all the stages after hibernation in *nephele* is that of the grass the larva feeds on, or very nearly, and the larvae, although so slow in their motions, fall from the stems at the least alarm ; so that they are sufficiently protected in their natural state against most enemies. The resemblance between the larvae of *nephele* and *sosybius* is very close indeed. So between the chrysalids, while *gemma*, usually grouped with *sosybius*, has quite a different caterpillar and chrysalis. *Eurytris* is much like *nephele*, except in color. I will soon give full descriptions of all these species in their early stages.

EGG OF NEPHELE—Conoidal, somewhat flattened at base, truncated at top, the sides rounded ; about 18 vertical ridges, with rounded excavations between, spring from the lower part of the side and run to the edge of the top ; this last is rounded, and covered with shallow cells, irregularly hexagonal around the outside, and in the middle long and narrow about an oval central cell. Duration of this stage 28 days.

YOUNG LARVA—Length one-tenth inch ; the anterior segments thickest ; on each side are three rows of long white bristles, one row being at the edge of dorsum, one on middle of the side, and one over the feet ; these spring from very prominent papillae, and the effect is to make the larva seem many sided ; the dorsal rows have one bristle on each of segments 2, 3, 4, but two on each of the others to last, and these are all curved back ; the second row has one to each segment and all are curved forward except on two last segments ; the lower row has two to each, and all are curved back ; color of body carnation ; there is a medio-dorsal crimson line, and three such lines close together on the side ; head large, one-half broader than 2, broader than high, sub-globose ; color light yellow-brown, speckled with brown, and sparsely pilose ; on some examples there are cloudy brown patches over the upper part of the face. Larvae hibernate at this stage.

AFTER FIRST MOULT—Length $\frac{1}{16}$ inch. ; cylindrical, thickest anteriorly ; the last segment terminating in two round, tapering and sharp appendages or tails, which are green, red at tips ; these are not divergent from a common base, but each starts from the extreme side, and the interval between their bases is square ; color pale green, crossed longi-

tudinally by dark green stripes, one rather broad, medio-dorsal, and three close together on side; each segment creased several times, and on the ridges thus caused are white papillæ, each sending out a blunt white hair; head nearly as before, a little broader than 2, somewhat broader in proportion to the height, light green, with white papillæ in vertical rows, each with white hair. Duration of this stage 23 days.

AFTER SECOND MOULT—Length $\frac{1}{3}\frac{1}{2}$ inch.; very much as before; whole surface one shade of yellow-green, except a dark dorsal stripe and a yellow ridge over the feet; head nearly as before. Duration of this stage 14 days.

AFTER THIRD MOULT—Length $\frac{1}{3}\frac{1}{2}$ inch. Nearly as at last stage; the head sub-globose, higher and narrower than before, well rounded at top, and broadest below; color of head emerald green, and covered as before with conical papillæ. Duration of this stage 14 days.

AFTER FOURTH MOULT—Length $\frac{1}{3}\frac{1}{2}$ inch.; greatest breadth $\frac{1}{3}\frac{1}{2}$ inch. This stage continued 28 days before chrysalis.

MATURE LARVA—Length 1.20 inch.; greatest breadth $\frac{1}{6}\frac{1}{2}$ inch. Cylindrical, thickest in middle segments, the back well rounded, and sloping equally to either extremity; ending in two sharp, conical tails, each placed at the extreme sides of the last segment; color dull yellow-green, the sides a shade darker than dorsum; a medio-dorsal dark green vascular stripe, and over the feet a yellow stripe or line; tails reddish; each segment creased about six times, and on the ridges so caused are many fine white papillæ, each sending out a fine white hair, rendering the whole surface pubescent; head sub-globose, a little larger than 2, frontally somewhat flattened, rounded at top, broader across the ocelli; color emerald green, the surface covered with slightly paler conical papillæ, pubescent.

CHRY SALIS—Length $\frac{1}{6}$ inch.; greatest breadth $\frac{1}{6}$ inch.; cylindrical, the abdomen evenly tapering; the wing cases a little raised at the margins; headcase short, roundly excavated at sides, and rounded at top; mesonotum slightly prominent, and followed by a small depression; roundly carinated, the sides nearly flat, or very little rounded; whole surface one shade of yellow green, covered with minute white granulations; along the inner margins of wing cases a cream white line, another along keel of mesonotum, and one across top of head case. Duration of this stage 14 days.

LIST OF ACRIDIDÆ FOUND IN NEBRASKA.

BY LAWRENCE BRUNER, WEST POINT, NEBRASKA.

Opomala carinata, Thos.	Œdipoda (?) venusta, Stahl.
" aptera, Scudd.	" sordida, Burm.
" brachyptera, Scudd.	" neglecta, Thos.
" bivittata, Serv.	" corallipes, Haldiman.
" neo-mexicana, Thos.	" aequalis, Uhler.
" punctipennis, Serv.	" collaris, Scudd.
" (?) varipes, Serv. ; at Omaha two years ago.	" trifasciata, Walker.
Chrysocraon viridis, Thos.	" cincta, Thos.
" punctulatum, Thos.	" verruculata, Scudd.
" conspersum, Thos.	" kiowa, Thos.
Stenobothrus admirabilis, Uhler.	" picta, Scudd.
" brunneus, Thos.	Brachypeplus magnus, Girard.
" aequalis, Scudd.	Stauronotus elliotti, Thos.
" propinquans, Scudd.	Boopeden nubilum, Thos.
" curtipennis, Scudd.	" flavofasciatum, Thos.
" gracilis, Scudd.	Pezotettix picta, Thos.
" maculipennis, Scudd.	" nebrascensis, Thos.
Gomphocerus clavatus, Thos.	" unicolor, Thos.
" simplex, Scudd.	" Scudderii, Uhler.
" euterpe, G. M. Dodge.	" borealis, Scudder.
Stetheophyma gracilis, Thos.	" alba, G. M. Dodge, n. sp.
Tragocephala viridifasciata, Harris.	" junius " "
" infuscata, Harris.	" autumnalis " "
Tomonotus sulphurea, Sauss.	" speciosa, Scudd.
" xanthopterus, Thos.	" gracilis, Bruner, n. sp.
" carinatus, Thos.	" occidentalis, " "
" tenebrosa, Thos.	Ommatolampis viridis, Thos.
Œdipoda carolina, Serv.	Caloptenus bivittata, Uhler.
" nebrascensis, Bruner.	" differentialis, Thos.
" discoidea, Serv.	" fasciatus, Scudd.
" eucerata, Uhler.	" spretus, Uhler.
" phoenicoptera, Germ.	" femur-rubrum, Burm.
	" griseus, Thos.

Caloptenus (?) bilituratus, Walk.	Acridium alutaceum, Harr.
" lurida, G. M. Dodge.	" emarginatum.
" minor, Scudd.	Tropidacris dux, Scudd.
" punctulatus, Uhler.	Tettix ornata, Scudd.
" occidentalis, Thos.	" granulata, Scudd.
" regalis, Dodge, n. sp.	" cucullata, Scudd.
" volucri, (?).	" triangularis, Scudd.
" angustipennis, (?).	Tettigidea lateralis, Scudd.
Acridium americanum, Scudd.	" " polymorpha, Scudd.
" ambiguum, Thos.	Batrachidea cristata, Scudd.

And in addition I have

3 species of Pezotettix, not yet determined.
2 " Caloptenus " "
2 " CEdipoda " "

And 3 others of different genera not yet determined, making a total of 95 species for Nebraska thus far.

TINEINA.

BY V. T. CHAMBERS, COVINGTON, KY.

BATRACHEDRA.

B. striolata ? Zell.

(*Asyncha* ? *pulvella* Cham.)

In "The Bulletin of the Geo. Survey," v. 3, p. 134, I have referred to two species or varieties of *Batrachedra* found by me in Colorado. Some of these specimens found at Colorado Springs I referred doubtfully to the European species *B. praengusta*. Others found higher up the mountains I named *B. Clemensella*, stating, however, the doubt whether the two forms were really distinct. After the greater portion of that paper was in the hands of the publisher, I received from Mr. Stainton two specimens of *praengusta*, by which I was enabled to recognise my *B. Clemensella* as a variety simply of that species, and to increase my doubts whether the supposed species were really distinct; for while *Clemensella*

differed slightly from the true *præangusta* in being a little larger and darker, with a slightly different arrangement of the colors, my supposed *præangusta* differed still more from it in the opposite direction, being smaller, with less of the dark colors and also in a slightly different arrangement of them. The European specimens were between my supposed *præangusta* and my *Clemensella* from Colorado, but nearer to the latter. I have no hesitation in referring my *Clemensella* to the true *præangusta*, and I feel very strongly inclined to refer my supposed *præangusta* also to that species, notwithstanding that two out of six specimens of it agree closely with Zeller's description of *B. striolata*, described by him from Texas. I have not been able to recognise any of my specimens in Dr. Clemens' description of *B. salicipomonella*, though those that agree most nearly with the European *præangusta* agree also best with Dr. Clemens' description of *salicipomonella*. In his edition of the Clemens papers, Mr. Stainton, who had seen both *salicipomonella* and the European *præangusta*, says nothing about the question as to whether the forms are distinct, and gives Dr. Clemens' account of *salicipomonella* without comment. Nevertheless, from correspondence with him, I infer (perhaps unwarrantably) that he is not altogether convinced that they are distinct species.

In Vol. 8 of the CANADIAN ENTOMOLOGIST, p. 171, I have described under the name of *Asychna? pulvella* (with the statement that it was not by any means a true *Asychna*) a species which was taken on willow trees in Kentucky, and which approaches nearly *B. striolata* Zell. and the form from Colorado which I first referred, as above stated, to *præangusta*. In these specimens the fore wings are sordid or yellowish white, dusted with fuscous, with a brown streak on the fold, another on the disc and a white spot at the end of the cell; another specimen taken in Kentucky since then has the streak on the fold and a brown spot at the end of the cell—none on the disc. My Kentucky specimens measure from $4\frac{1}{2}$ to 5 lines *alar ex.*; those from Colorado that I referred to *præangusta* (= *striolata* Zell.) measured 5 lines; Mr. Stainton gives $5\frac{1}{2}$ lines as the *alar ex.* of *salicipomonella*, and 7 as that of the true *præangusta*. Zeller gives — as that of *striolata*; and the specimens from Colorado which I named *Clemensella*, but now refer to *præangusta*, measured a little over 7 lines. I doubt greatly whether all are not referable to a single species, *præangusta*, or at most to only two, which are best represented by *præangusta* and *striolata*.

I was led into the error of referring the Kentucky specimens to *Asynchia?* by getting hold of the wrong figures of the neurulation—combining the neurulation of *Bedellia somulentella* with the external characters of *Batrachedra*.

PERIMEDE.

P. erransella Cham.

In perfectly fresh specimens each of the four small tufts of raised scales on the fore wings is seen to be margined behind with white; there is a minute blackish spot at the extreme tip margined before with white, a minute white costal spot containing raised scales at the beginning of the ciliae, and a row of minute white specks of raised scales around the base of the ciliae. On the under side these spots are seen reversed, that is, the scales around the base of the ciliae are whitish, and the specks dark brown; there is also a minute brown spot at the apex of the hind wings on the under surface. The tarsi are brown, prettily annulate with white.

The account given at p. 51, v. 6, of the neurulation is slightly incorrect; there is (at least in some specimens) one more subcostal branch than is there stated, in the fore wings. The neurulation of both wings is thus almost exactly that of *Laverna Staintoni*, as figured *Ins. Brit.*, v. 3. The wings are, however, a little more elongate and are narrower. It is closely allied to *Laverna*, but the palpi are nearly as slender as those of the figure of *Anybia langiella* (*Ins. Brit.*, v. 3), though much shorter—rather like those of *Chrysoclista liniella* (*loc. cit.*) Its position in repose is singular for an insect so near to *Laverna*; the face is applied to the surface on which it rests, and the abdomen and wings elevated as it rests on the two anterior pairs of legs, with the third pair drawn up alongside the abdomen under the wings—more like an *Argyresthia* than a *Laverna*.

RAVAGES OF WHITE ANTS.—The Commissioner of Agriculture recently received from the Consul General at Monrovia, Liberia, a box of twelve books, principally United States public documents, that had been badly damaged by white ants, in several cases more than a third of the book having been destroyed entirely. The damage was done in the space of a few months while the Consul was absent. It is stated in the letter accompanying, that to preserve books and papers from the ravages of this insect, they must be kept free from dust and well exposed to the air.—*Field and Forest*.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana : Insecta.

(Continued from Vol. vii., p. 159.)

[254.] V.—HYMENOPTERA.

[257.] FAMILY SIRICIDÆ.

356. *SIREX JUVENCUS* Linn.—Length of body, mucro included, 11 lines; expansion of wings 20 lines. One specimen taken in Lat. 65°.

Body black-blue, glossy, punctured very thickly on the head and trunk, in which from each puncture proceeds a black hair. Head between globose and triangular, very hairy with a naked spot behind the eyes; cheek terminating in a tooth or point as in the other species of the genus; vertex blue-green; antennæ black, shorter than the thorax; palpi piceous; trunk subglobose, with the central part of the thorax and the part between the four anterior legs tinted with green; legs rufous with the coxae and trochanters black; wings hyaline with piceous nervures; abdomen naked, terminated by a subtriangular acuminate mucro or horn; ovipositor piceous.

In this specimen the ovipositor is longer and goes further beyond the anal horn than in the European ones, and the horn itself is more dilated at the base.

[258.] FAMILY FŒNIIDÆ.

357. *FŒNUS JACULATOR* Linn.—Two specimens taken in Lat. 65°.

The American specimens differ from those of Europe, which also vary, in having the red segments of the abdomen marked with a large black basilar dorsal spot, the former having mostly only a darker cloud. Panzer's figure, however, comes very near the American.

[It is doubtful that the European species occurs in America; they are probably distinct.]

FAMILY ICHNEUMONIDÆ.

358. ICHNEUMON FERRUGATOR Kirby.—Length of body 7 lines. Taken in the Expedition, but no locality stated.

[259.] Abdomen black, rather glossy, very thickly punctured with minute and often confluent punctures. Head transverse, triangular, not quite so wide as the middle of the trunk; anterior margin of the face rounded; palpi reddish; eyes long, subelliptical; antennæ shorter than the trunk, spirally convoluted; trunk oblong, subcompressed; scutellum subtriangular, rounded at the apex; metathorax armed on each side with a short tooth, with several elevated longitudinal and oblique lines; legs with decumbent whitish hairs, anterior tibiæ obscurely, and all the tarsi, rufous; wings embrowned with a rufous tint, nervures darker; abdomen linear-lanceolate, ruso-ferruginous, with the first joint, which is dilated at the apex, black; footstalk channelled longitudinally on each side.

FAMILY CRYPTIDÆ.

359. CRYPTUS VIDUATORIUS Fabr.:—Length of body, with ovipositor, $5\frac{1}{4}$ lines; do, without ovipositor, $3\frac{1}{2}$ lines. One specimen taken in Lat. 54° .

Body black. Head subtriangular, transverse, very minutely and thickly punctured; palpi pale rufous; face plane with two elevations in the middle; eyes large, oval; antennæ shorter than the trunk, rather slender, involute, black with a white band in the middle; orbit of the eyes behind with a very indistinct white line; trunk oblong, cubical, gibbous, very thickly and confluent punctured except on the back; tegulæ white; metathorax armed with two minute teeth on each side, one in the middle and the other at the base, forming the terminal angle, marked out into three areas by elevated lines; legs red with coxæ, trochanters, and posterior tarsi black; wings subtestaceous with the larger nervures black; abdomen, excluding the ovipositor, scarcely so long as the trunk; first segment impunctured, glossy, dilated at the apex, which is subquadangular; footstalk flat; second and third segments very large, with their gloss obscured by infinitely minute punctures; ovipositor shorter than the abdomen; borer red.

[260.] GENUS CRYPTOCENTRUM.

Head between transverse and globose; face quadrangular, with the anterior margin crenate; palpi long, filiform; antennæ slender, first joint thick; second minute; third longer than the rest; trunk ovate-oblong, subcompressed; neck moderately long; scutellum trapezoidal; legs slender, posterior pair elongated; upper wings-apical areolets three; middle four, viz., 2, 2, without a cellule; basilar three; under wings-areolets seven, viz., 4, 3; abdomen sessile, smooth, subcompressed, in the female clubbed at the apex; four first segments longer than the rest, the first curved, rather wider at the apex; the three next are wider than long, the last is minute and triangular; at the extremity the tail is cleft for the passage of the ovipositor; this cleft is formed by the turning up of the sides of the last ventral segment: ovipositor very short; the four last ventral segments, at least in the dead insect, project so as to form an elevated ridge in which the ovipositor is concealed.

360. *Cryptocentrum lineolatum* Kirby.—Plate vi, fig. 1.—Length of body 6 lines. A single specimen taken in Lat. 65°.

Body very black, somewhat glossy, sprinkled with whitish decumbent hairs. Head subtransverse, hollowed out behind to receive the neck; face with a streak on each side the eyes; feelers and scape of the antennæ on the outside white; antennæ slender, black, externally obscurely testaceous, with a white annulet below the middle; trunk compressed; margin of the collar on each side, tegulae, and two transverse elevated streaks on the scutellum, white; four anterior legs with the coxae and trochanters, tip of the thigh and under side of the tibiae, white; the thighs, except the tip, testaceous; upper side of the tibiae and tarsi, and long posterior legs, black; wings hyaline with black nervures; abdomen sessile, with the last segments dilated for the reception of the ovipositor; the apical margin of all the segments but the two first is interruptedly white; but in those segments the interruption is not perfect.

[261.] FAMILY BRACONIDÆ.

361. *Bracon crocator* Kirby.—Length of body without ovipositor 3 lines. A single specimen taken in Lat. 65°.

Body very black, glossy. Head subglobose, with the segment of a circle taken out behind; eyes between oval and round; antennæ as long

as the trunk ; trunk oblong, widest between the wings ; scutellum rather large, rounded at the apex ; metathorax obsoletely transversely wrinkled, sloping towards the abdomen ; posterior legs rather robust ; wings embrowned, middle areolets four, viz., 3 and 1, all quadrangular ; stigma very large ; abdomen lanceolate-ovate, as long as the trunk, saffron coloured, paler towards the apex ; the three first segments are emarginate, and marked with two longitudinal faint furrows, the first pair being curvilinear ; ovipositor longer than the body, borer red.

FAMILY FORMICIDÆ.

[262.] 362. *FORMICA SEMIPUNCTATA* Kirby.—Length of body $7\frac{3}{4}$ lines. Several taken in Journey from New York to Cumberland-house.

Body black, glossy. Head something wider than the trunk, subtriangular ; antennæ piceous with the scape black ; wings cast in all the specimens ; scale vertical between the trunk and abdomen, sloping to a thin edge upwards, where it is very slightly emarginate ; abdomen oblong, subcylindrical, minutely punctured with the punctures piliforous ; hairs decumbent with those of the margin of the segments and the anus, longer ; margin of both abdominal and ventral segments membranous, membrane reddish ; base of the three intermediate segments not punctured.

363. *FORMICA FUSCA* Linn.—Length of body $1\frac{1}{4}$ line. One specimen taken in Lat. 65° .

[263.] ♀.—Body black, but not intensely, glossy, subcinereous from down. Head triangular, large, much wider than the trunk ; antennæ with the scape, the three following joints, and the terminal one, rufous ; the other joints are darker ; trunk oblong, compressed, anteriorly elevated and wider ; the prothorax with the scutellum forming a rhomboid ; scutellum large, trapezoidal, subrufous ; scale subtriangular, subemarginate ; legs rufous ; thighs embrowned ; abdomen subglobose, more hairy than the rest of the body, especially towards the anus.

FAMILY VESPIDÆ.

364. *VESPA VULCANA* Linn.—Length of body $6\frac{1}{2}$ lines. A single specimen taken in Lat. 65° .

[264.] ♀.—Body black, variegated with yellow. Head and trunk thickly clothed with long woolly down of a grayish colour; face with three yellow spots placed in a transverse line behind the antennae, the two lateral ones subtriangular, the intermediate one subquadrangular, with a reddish cloud on its disk; the nose below the antennae is yellow, inclining to red round the margin; it has also three black dots placed in a triangle in the disk, the two lower ones being very minute; the vertex of the nose is also black; the mandibles are yellow with black tips; on the outside the orbit of the eyes is reddish-yellow; the trunk is black underneath; above the posterior upper margin of the collar, the tegulae which cover the base of the wings, and a triangular spot underneath them, are yellow; on the metathorax and scutellum are six yellow spots placed in a double series, the upper and lower pairs being subtriangular, and the intermediate pair crescent-shaped; the thighs are black at the base, but their apex, and the rest of the leg, and a small triangular spot on the inner side of the four posterior trochanters, are yellow; the wings are yellowish red with red nervures; the abdomen, except at the base, is less hairy than the rest of the body; it is yellow with all the segments black at the base; though the blackness in the terminal ones is chiefly concealed by the antecedent segments; in all in the middle it projects into a triangle; the four intermediate ones have also each a round-headed small black spot, the connection of which with the blackness of the base is interrupted in the second segment; on the under side of the abdomen the base of the segments is black, and the intermediate ones have each a pair of rather crescent-shaped black spots not connected with the blackness of the base.

[Kirby states that the specimen above described differs somewhat from the European wasps of this species, but he considers it to be merely a variety of the latter. Later authors state that both *V. vulgaris* and *V. germanica*, European species, are found on this side of the Atlantic.]

365. *VESPA BOREALIS* Kirby.—Length of body $7\frac{1}{2}$ lines. A single specimen taken with the last.

[265.] Body black, downy, especially the head and trunk, with gray hairs. Nose trapezoidal, yellow with a black floriform discoidal spot; anterior margin with three sinuses taken out; vertex with a trapezoidal yellow spot just above the base of the antennæ; antennæ black, luteous

underneath; external orbit of the eyes and mandibles yellow; lateral margin of the collar, a triangular small spot under each wing, two narrow transverse and internally acute spots on the scutellum, and two similar ones below them on the metathorax, all white; tegulae white with a brownish spot in the disk; legs yellow; thighs black at the base; wings testaceous; abdomen heart-shaped, with the bases of the segments where uncovered, and two dots on each except the first, black; the middle part of the black basal bands projects into a triangular tooth; the under side is nearly similar, but the projections form a longitudinal stripe.

366. *VESPA MARGINATA* Kirby.—Plate vi., fig. 2.—Length of body $7\frac{1}{2}$ lines. Taken in the route from New York, and again in Lat. 65° .

♀.—Body black, punctured, downy from a mixture of black and gray hairs. Mandibles white with a black margin; palpi reddish; nose white with a flask-shaped longitudinal black spot in the disk; just above the antennae is a bilobed white spot, between which and the eye is a white line, and another external one above it; antennae short, not much exceeding the head, black with the scape white underneath; in one of the specimens there is a reddish spot underneath on the four or five last joints, which is not discernible in the others; the external margin of the collar, before each wing, and a small triangular spot on each side of the scutellum, are white; wings embrowned with darker nervures, but the costal nervure and tegulae are ferruginous; legs testaceous, black at the base; abdomen with the apex of the dorsal and ventral segments white; anal segment black with a pair of white spots; the white margin of the dorsal segments receives an intermediate triangular point, and on each side of it a rounded lobe from the black base.

[266.] 367. *VESPA MACULATA* Linn.—Length of body 10 lines. A single specimen taken in Lat. 65° .

[As this insect, commonly known as the "White-faced Hornet," is so abundant in Canada, and has been so often described, it is unnecessary to quote Kirby's description.]

FAMILY PROSOPIDÆ.

368. *PROSOPIS ELLIPTICA* Kirby.—Length of body 3 lines. Three specimens taken in Lat. 65° .

[267.] Body very black, slightly downy, minutely punctured. Apex of the nose white, whiteness lobed; inner orbit of the eyes below the antennae white; vertex channelled below the eyelets; antennae scarcely longer than the head; the projecting lobes of the collar terminate in a white tubercle; base-covers piceous; wings hyaline with dark nervures; metathorax longitudinally wrinkled; posterior tibiae annulated at the base with white; abdomen more glossy than the rest of the body, almost naked, and scarcely punctured; it is narrower and more elliptical than in any other known species of the genus.

[This species and another, *P. affinis* Smith, are found in Canada.]

FAMILY ANDRENIDÆ.

369. *HALICTUS RUBICUNDUS* Stephens.—Length of body 5 lines. Four specimens taken, locality not stated.

♀.—Body black, downy. Head suborbicular, down grayish; space between the eyes broad; down on the thorax thicker, ferruginous; base-covers rufo-piceous; wings subhyaline; nervures and stigma testaceous; post-costal nervure black; legs thickly set with yellow hairs which shine like gold; tarsi testaceous; abdomen elliptical, downy with decumbent hairs; margin of the segments fringed with white hairs, the two first sub-interruptedly; the ventral segments are similarly fringed, but the hairs are shorter.

370. *HALICTUS CRASSICORNIS* Kirby.—Length of body 3 lines. A single specimen taken in Lat. 54°.

[268.] ♀.—This little insect is so extremely like *Halictus levis*, that at first I regarded it merely as a variety of that species, but upon a closer inspection they appear to me distinct. In *H. crassicornis* the antennae are proportionally more robust, but the principal difference lies in the sculpture of the thorax. In *H. levis* that part is visibly punctured with scattered punctures, but in the insect I am describing, under a common lens, the punctures are scarcely discernible, but under a higher power, besides a slight channel drawn longitudinally, innumerable very minute punctures appear. In the former also the stigma of the upper wings is piceous, while in the latter it is testaceous. In other respects they are perfectly similar.

371. *ANDRENA IMPUNCTA* Kirby.—Length of body 5½ lines. A

single specimen taken in the Journey from New York to Cumberland-house.

♀.—Body black, clothed with rather long whitish hairs, especially the face below the antennae; hairs of the thorax rufescent; wings subhyaline a little darker at the tip; nervures testaceous, post-costal black; brush of the posterior tibia white; abdomen impunctured with the hairs of its anterior half white; the other hairs above and below black.

372. *ANDRENA VARIANS* Ross.—Length of body $5\frac{1}{2}$ lines. Three specimens taken, locality not stated.

[269.] ♀.—Very like the species just described, but the head is clothed with black hair; that of the thorax and base of the abdomen is tawny-red; the brush of the posterior tibia is changeable, as the site varies, from black to white; the hairs of the under side of the body and of the last abdominal segment above are black, except those on the posterior thighs forming the flocculus, which are whitish, as are those of the anterior part of the abdomen.

FAMILY NOMADIDÆ.

373. *NOMADA AMERICANA* Kirby.—Plate vi., fig. 3.—Length of body $4\frac{1}{2}$ lines. A single specimen taken in Lat. 65° .

Body dark-ferruginous. Thorax with a longitudinal mesal black line, less distinct on the metathorax; breast with a black spot on each side; wings, as in the rest of the genus, embrowned with a white spot near the tip; thighs black at the base on the under side; first segment of the abdomen black at the base, and, with the second and third, brown at the apex.

This is the only American *Nomada* I ever saw, and Fabricius describes none from that country. It comes near *Nomada ruficornis* and *striata*, but it has only a single black stripe on the thorax.

[Dr. Packard states that these Cuckoo-bees, the *Nomada*, are very numerous in America.]

[270.] FAMILY CHELOSTOMIDÆ.

374. *CHELOSTOMA ALBIFRONS* Kirby.—Length of body $4\frac{1}{2}$ lines. A single specimen taken in Lat. 65° .

♂.—Body black, thickly punctured. Mouth bearded with white; mandibles carinated above, armed with two strong terminal teeth; nose square, flat, clothed with decumbent silver pile; antennæ filiform; scape black; the other joints are rufo-piceous underneath; trunk very hirsute with white or subcinereous hairs; wings a little embrowned, with black veins and base-covers; legs hairy; abdomen subcylindrical, hirsute with black hairs, incurved with the apex of the four intermediate segments fringed with white hairs; anal joint with a concavity above, obtuse; last ventral segment forcipate, rufo-piceous

NEW SPECIES OF LEPIDOPTERA.

BY A. R. GROTE,

Director of the Museum, Buffalo Society Natural Sciences.

Scopelosoma tristigmata, n. s.

This form, or species, belongs to the series of *Walkeri* and *vinulenta*, of the former of which I was at first disposed to consider it a variety. It is distinguished by the presence of all three of the ordinary spots. Rusty ochre; t. a. line single, even, blackish with the small rusty outlined-claviform attached. Orbicular rusty-ringed, with pale centre, small. Reniform pale ochre, rusty-ringed, well sized, of the ordinary shape, with a black inferior stain. Median shade a little waved, joining the reniform above and issuing from it inferiorly. T. p. line much as in *Walkeri*, with the three black streaks on the median nervules unusually distinct. S. t. line margined before with a fuscous shade, pale, irregular; terminal space contrasting, fuscous, with the veins black-marked. Fringes ochreous. Hind wings blackish fuscous, with ochrey fringe. Head and thorax rusty ochre; antennæ paler at base; abdomen fuscous, rusty ochre at sides and tip and beneath. Wings ochreous beneath, with common shade band, flexed on hind wings, which show a discal mark. Expanse 35 mil. Newtonville, Mass., No. 8, April 23, Mr. Roland Thaxter.

Tarache abdominalis, n. s.

This species is parallel with *apraca* and may be distinguished by the blackish abdomen, ringed with white. It varies in the color of primaries and thorax. In some specimens the fore wings are white from the base to exterior line with two dark costal patches as in the type *apraca*. The exterior line is heavier and more metallic than in *apraca*. The subterminal line is notably less inwardly projected than in *apraca* below the median nervules. Again, the fore wings are more or less blackish at base, leaving two white costal blotches as in *bipлага*. Beneath the two forms are to be quickly distinguished. In *abdominalis* the wings are yellowish, the hind wings with a terminal blackish band, two discal longitudinal rays from the base and a transverse fascia broadly marked on costa in the best marked specimens ; the rays and transverse fascia become more or less obsolete. Above the hind wings are black or blackish, sometimes pale yellowish on disc, always darker than in *apraca*. Thorax and head blackish ; tegulae more or less white on the sides. Expanse 25 mil. Hab. Texas (Belfrage No. 596) ; also collected by Heiligbrodt, in Mr. Meske's collection. The colors of the dark outer portion of the fore wings are brighter than in *apraca*, the band before t. p. line more olivaceous, the subterminal line more tinged with brown. I have to thank Mr. v. Meske for drawing my attention to this form, which from the description cannot be *obatra* of Mr. Morrison.

Geometra rectaria, n. s.

♂. This species is smaller than *iridaria*, of a rather more dull green and with one-half narrower white lines. Costa of primaries whitish, much marbled with fuscous. Inner white line of primaries perfectly straight. Outer line extending across hind wings in same position as in *iridaria*. Minute black discal points on both wings. Fringes concolorous, not paler as in *iridaria*. Head white ; palpi brown at tips. Legs white with black dots at extremities of second and third joints. Beneath secondaries a little paler than primaries, on which alone the minute black discal points are legible. The common exterior line is indistinctly shown. Tegulae and collar green ; dorsum of thorax discolored. Expanse 25 mil. Hab. Texas (Belfrage, No. 323).

This species differs from Mr. Walker's descriptions of forms unidentified by Dr. Packard more broadly than from *iridaria*. The wings and body are proportioned as in *iridaria*. From the description I should not refer

Geometra minicata Walk. to this genus. *G. rectaria* may be included by Dr. Packard among his Texan material of *iridaria*, but I do not think it is the same; the green fringes seem shorter, the narrow lines, the inner one on primaries perfectly straight and the more brown and inconspicuous costal edging are as strong as specific characters seem to be in this group. The dot on hind wings beneath is obsolete; there are no white markings on the veins.

ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The annual meeting of this Club will be held at Nashville, Tenn., on Tuesday, the 28th of August, at 3 p. m. The regular meetings of the Association will commence on the following day. The pleasures connected with the annual re-union of Entomologists during the meetings of the Club will, we doubt not, attract to Nashville many of the "brethren of the net." The citizens of Nashville are offering private hospitality to all the members of the Association who will accept it, and have also made arrangements for hotel accommodations and railway tickets at reduced rates. We hope to hear of a large attendance.

CLISIOCAMPA SYLVATICA — THE FOREST TENT CATERPILLAR.

BY THE EDITOR.

The larvae of this moth (see fig. 6) have been enormously abundant this season in the vicinity of London, Ontario. Vast swarms numbering millions upon millions consumed the foliage of fruit and forest trees during

the latter part of May and the early weeks of June. By the 5th of the latter month they had become about two-thirds grown, when the daily consumption of foliage was so immense that their presence attracted general attention and the most vigorous onslaughts were made on them from all sides. But notwithstanding they were slain every day by

Fig. 6.



millions, their numbers seemed scarcely to diminish. In many places the forests by the middle of June were so completely denuded that they afforded but little more shade than in mid-winter, trees of all kinds suffering severely. They attacked the oak, ash, basswood, maple, thorn, cherry, beech and hickory, as well as almost all sorts of fruit and ornamental trees, and during June their activity in travelling from place to place was so incessant that the most constant vigilance was required to save favorite trees from destruction. Their habit of congregating in large masses on the trunks of the trees they fed on in the mornings rendered their partial destruction comparatively easy ; had it not been for this scarcely a leaf would have been left on any of the trees named in the whole neighborhood.

When the larvae began to change to chrysalids they sewed up the remaining fragments of the few leaves still unconsumed on the trees into all kinds of curious shapes, each enclosure frequently protecting two or three cocoons. These cases hanging pendant with the weight of their contents, and with the paler under surfaces of the leaves displayed, looked in many instances as if a crop of some strange fruit was maturing. On gathering a number of the chrysalids, a very large proportion of them were found infested with parasites, chiefly dipterous, with occasional examples of the hymenopterous order.

Early in July the evenings were enlivened by large numbers of the moths which flew vigorously about in lighted rooms, thumping against everything in their erratic and apparently aimless flight. In a few days their egg masses were to be seen in considerable numbers on the branches of fruit and forest trees, where they will remain, unless otherwise destroyed, until the period of their hatching next spring.

MISCELLANEOUS.

PAPILIO THOAS.—On the 1st and 2nd of August, I had the pleasure of capturing in a field near Amherstburg, Ontario, eleven specimens of *Papilio thoas*, most of them in good condition, besides a number of other species of butterflies. The specimens of *thoas* were all taken on the flowers of thistles.—J. M. DENTON, London.

CISTHENE SUBJECTA.—Early in July the writer captured two specimens of this elegant little moth, generally very rare here, on the blossoms of Milkweed (*Asclepias cornuti*). Their legs had been caught in the sticky substance which exudes from the sides of the flowers, and thus they were held firmly.—ED. C. E.

MELITAEA PHAETON.—For two or three years past I have searched in vain throughout this locality for *M. phaeton*, but this season I have taken all that I wanted; indeed, they were so abundant that at one time I might have taken a hundred in a few hours had I wished to do so. I have taken also a specimen of *Myrmecleon obsoletus* Say, and one of *Psycomorpha epimenis* Drury, both rare in this neighborhood.—J. ELWYN BATES, South Abington, Mass.

AMBLYCHYLA CYLINDRIFORMIS.—We are indebted to our friend, Mr. S. W. Williston, of New Haven, Conn., for a very fine specimen of this hitherto rare insect, which reached us by mail from Kansas in excellent condition. On opening the small tin box in which it had been confined, it seemed as healthy and vigorous as possible, moving briskly around in its endeavors to escape. It is a very handsome creature, and will prove a most acceptable addition to our cabinet.—ED. C. E.

FOOD PLANT OF S. CECROPIA.—We have taken the larvae of *cecropia* this year feeding on the European Alder; they were nearly full grown, and the amount of foliage consumed on the young trees left little doubt that the eggs had been laid and the larvae matured entirely on these trees.—ED. C. E.

I have taken at sugar this season *Sphinx Kalmiae* and *myron*.

Is it not unusual to see *Catocalas* about in day time? Recently I took *C. subnata* feeding on the edge of a swill barrel at mid-day—the barrel standing in the shade, however.—W. L. DEVEREAUX, Clyde, N. Y.