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No. 3.

NOTES ON "A REVISION OF THE GENUS *CENEIS*" (CHIONOBAS), "BY HENRY J. ELWES, F. L. S., F. Z. S. PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF LONDON, AND JAMES EDWARDS, F. E. S.," TRANS. ENT. SOC., LOND., 1893, PART IV. (DEC.).

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

Mr. Elwes has again favoured us with one of his periodical Revisions of Genera, the last of which, relating to *Argynnis*, was reviewed by me in the CAN. ENT., XXII., p. 81, 1890.

It is stated that Mr. James Edwards is responsible for the matter of what are called "claspers" of the male, meaning the claspers of other authors; and these parts of the whole body of abdominal appendages are the only ones treated of, or relied on. He has also given a comparative table at the end, based partly on the facies, and partly on the claspers. A plate of these last is appended. On p. 458 is a statement of "the types of clasp-form" found in the genus: "in *Norna* and *Jutta* there is an unusual amount of variation, but the differences are merely those of degree, and are not, in the most extreme cases, sufficient to obscure the relationship of the species." Of like types of the "clasp-form" are:—

1. *Chryxus*, *Bore*, *Taygete*.
2. *Urda*, *Uhleri*. 3. Foreign all.
4. *Semidea*, *Jutta*, *Fulla*.
5. *Subhyalina* (which, according to Elwes, is *Aeno*, Boisd., and *Crambis*, Freyer), *Brucei*, *Norna*.

It strikes me that it is rather odd, if claspers are tests of affinity or separateness, that *Chryxus* and *Bore* should fall together; or *Semidea* and *Jutta*; or *Aeno* and *Norna*; in each case the two species named

belonging to different sub-groups. *Brucei* as a species was pronounced by Dr. Staudinger originally to be a form of *Bore*. Turning to the plate, it appears that the claspers of *Norna* and what is called "*Semidea*, Colorado form," (and which is *Aeno*, Bdv.) are sufficiently alike to be one species, though widely separated by the facies, and *Semidea* of the White Mts. is farther from *Aeno* than from *Norna*, though the first two are of one sub-group. The truth is that claspers, or the whole body of abdominal appendages, are unreliable for determining what are species. Mr. Scudder unwittingly gave the *coup de grace* to that fad, when he said, p. 329, Butt., N. E., of *Grapta Interrogationis*, that "the two forms of this species, *Fabricii* and *Umbrosa*, differ so greatly and so constantly from each other, not only in the colouring, but in the form of the wings, and even in the abdominal appendages, that they have been considered as distinct species." That is, if they had not by breeding from the egg been proved to be one species, they would be considered as two! But in Mr. Scudder's plates, which are a marvel of drawing, and are of undoubted accuracy, several species of *Argynnis* have one style of organs; so several *Graptas*; several *Phyciodes*, several *Theclas*, several *Limentitis*, several *Colias*, etc.; differing between themselves in each case not more than the individuals of any one species would doubtless differ. We read even in this Revision under view that in *Norna* and in *Jutta* there is an unusual amount of individual variation in the claspers. Of course there is such variation everywhere. In every part of the organization of every species there is individual variation. I have before gone into this subject pretty fully, in the CAN. ENT., XXIII., p. 55, and need not say more here. Though I may as well add that by Mr. Scudder's plates the allied groups do not always show the same style of organs, thus: *Grapta Progne* cannot be distinguished from *Grapta Comma*, though they belong to different sub-groups, while *Grapta Faunus* differs conspicuously from *Comma*, though these two belong to one and the same sub-group. Twenty years ago, before the larvæ of these species had been reared, Dr. Staudinger and others, judging by the facies, insisted that *Faunus* and *Comma* and *Grapta Satyrus* were nothing but one species. See Butt. N. A., Vol. I., Note to *G. Comma* text. And this, by the way, is a good illustration of the unreliability of facies alone for determining species which are closely allied. In my opinion, after reading what has been published by Mr. Scudder on the genitalia, and carefully going over his beautiful plates, I deny that claspers and all the organs together are valuable for the pur-

poses claimed. They may be of aid in case of families and genera ; but are unreliable, and therefore valueless in case of species.

We now come to the list of species, p. 460. I shall speak only of the North American species, for I have no acquaintance with others, except such as specimens of the butterflies in my collection afford, and in several cases I have never seen the species. Under *Nevadensis*, Felder, are ranged *Gigas*, Butler, *Californica*, Bdl., and *Iduna*, Edw. "After comparing very numerous specimens in my own and other collections, from California, Oregon, Washington and Vancouver Island, of which the last was sent me by Mr. Fletcher as *Gigas*, I cannot allow that the differences relied on by Mr. W. H. Edwards between these *Californica* and *Iduna* are of any weight, and I have no hesitation in uniting these four supposed forms. The habitat of THIS SPECIES is peculiar. I have TAKEN IT in Oregon, at about 2,000 feet, flying in stony or rocky pine woods, where there was not much undergrowth. It occurs as high as 7,000 feet, on Mt. Hood, in the same State, according to Morrison, and is common in the pine forests of Mendocino County, California." That is as good a sample of the illumination of this author as I could select. He has become possessed of, or has seen numerous specimens of THIS species, (one, or at most a trifling number, was sent him as *Gigas*), and undertakes to decide off-hand that all these forms are one species, and that IT flies in Vancouver Island, Mendocino and Oregon. Mr. W. G. Wright has taken *Gigas* on Vancouver Island two seasons ; has taken *Iduna* at Mendocino two, if not three, seasons ; and *Californica* in Washington. He is positive that they are three distinct species, from their habits of flight, and his observations on their behaviour in natural state ; and from the character of the regions they constantly inhabit. Mr. Fletcher, who has taken *Gigas* in Vancouver, has written me since he has seen this Revision :—"I don't agree with him that *Nevadensis* is the same as *Californica* and *Gigas* at all. All three are to my mind quite distinct, in the males at any rate."

I, myself, have never seen one of these species alive, but I have bred two of them from egg to adult larva, namely, *Iduna* and *Californica*, in both cases the larvæ reaching the adult stage the same season, but dying before pupation ; and twice I have reared larvæ of *Gigas* to the second moult, when they all hibernated. In fact, I have, or ought to have, larvæ of *Gigas* alive to-day. And from these stages, and the behaviour of the larvæ, I am certain there are three species. As Mr. Elwes speaks of the "differ-

ences relied on by Mr. Edwards," he refers to my plates and text in Vol. 2, B. N. A., 1875; and I should here say that when those plates were published, my information as to all these forms was very meagre, and very few examples were in collections. As to *Gigas*, I had never seen the male, and the only one known to be in any collection was the type specimen in the British Museum. So my figure was given from a drawing made for the purpose at the Museum, and it was badly coloured, and inadequately represented the under side of the hind wing, which in this genus is usually the most characteristic part of the insect. As to the female, it was copied from the best of three poor examples which I had from Mr. Crotch, and these were the only examples of the species in American collections. The figures of *Californica* and *Iduna* are well done. I intend before Vol. 3 closes to re-figure *Gigas*, and to give all the stages I may then be able to; and all the stages of the other two except the pupæ. As to *Nevadensis*, it is not a fourth species, though I let it stand alone, not knowing to which of the three it was intended to apply. It was impossible to decide from the very poor figure or the description. I rather thought it was meant to represent *Californica*, but Dr. Holland is confident that it was intended for *Gigas*. If this is so, apparently the name of the Vancouver species should be *Nevadensis*, as the catalogues date it 1867, whereas *Gigas* dates 1868. But Mr. Butler has informed me that Felder antedated by one year his species. It was really not published and on sale till 1868, and subsequent to the issue of the Cat. of Satyr., which figured and described *Gigas*, and so *Gigas* would have priority. A vast deal has been learned respecting these species since 1875, and they are now by no means uncommon in collections.

That Mr. Elwes is sometimes willing to allow that habitat and habits of flight are a factor in determining species, as well as distinct geographical ranges, appears in what he says of *Ivallda*, on p. 469:—"I was inclined to think *Ivallda* was a pale form of this (*Chryxus*), as I could not see any distinction but that of colour. Prof. Owen, however, who has taken both, assures me that the habitat and flight of the two differ; and, as the geographical range of *Ivallda*, which, so far as we know, is confined to the Sierra Nevada, in Placer County, California, and about Lake Tahoe, is quite distinct from that of *Chryxus*, which is not known to occur in the Rockies in the U. S., it may probably be looked on as a constantly distinct species." This is really sensible and to the point. Mr. Bruce had written me from Colorado, last summer, after spending a day

on the peaks with Mr. Elwes:—"In *Ivallda*, as a species, he utterly disbelieves, though Mr. Owen said there was a vast deal of difference between the habits of it and *Chryxus*." Mr. Elwes afterwards visited Professor Owen, and it appears yielded his prepossessions. But why does not a difference in habits and flight and geographical range in the three species before spoken of indicate differences which are specific, as well as in *Ivallda* and *Chryxus*?

On page 466, our author thinks that in the absence of any confirmation of Mr. Fletcher's statement that "a single female of *Macounii* was taken at Morley, Alberta, he is inclined to think this female must have been *Nevadensis*"—which is the first time I have heard that a statement of Mr. Fletcher's needed confirmation by another witness. "But our entomological knowledge of the vast tract of prairie and forest north and west of Lake Superior is so trifling that I have little doubt that it (*Macounii*) will be discovered elsewhere." In the Revision of *Argynnis*, this author laid it down as a proposition that North America was now so thoroughly explored that no more new species of *Argynnis* need be expected to appear. Since the publication of which I have described six new species of *Argynnis*, three of them as pronounced as *Atossa*, *Alberta* and *Victoria*. It is unsafe to prophesy.

Under *Uhleri* is put *Varuna* as identical. "It is impossible to separate the two forms," p. 472. *Varuna* is a plains species, in Dakota, according to Wiley, living on the "bad lands," and on rolling and plateau prairie, which is covered with grass and sage-bush, the elevation about 2,000 feet. Morrison took it in Dakota also, elevation 1,200 feet. Mr. Wright took it in Montana, on the foot-hills of the low, isolated mountains, considerably to the East of the Rockies. He says: "I have never seen it flying west of the Missouri River, nor on any of the spurs of the chief Rocky Mts. It flies only on the lower slopes, say at 1,000 feet or so above the level lands." Mr. Elwes says, that in the Rocky Mts. of Alberta it goes up 4,000 feet, at Kananaskis, which would be equivalent to upwards of 5,000 in Colorado; but that he has taken *Uhleri* in the Rockies at 9,000-10,000 feet, and in Yellowstone Park at 7,000. Mr. Bruce says *Uhleri* is taken at from 5,500 to 10,000 feet, in Colorado. One and the same species of *Chionobas* does not fly on low grassy plains and on alpine peaks. The differences in the facies of the imago are patent enough to an experienced eye. Undoubtedly they are two

species. I have treated sufficiently of this matter in Part 12, Vol. III., B. N. A. The case is parallel to that of *Chryxus* and *Ivallda*, allowed by the author to be two species. But, if *Varuna* cannot be separated from *Uhleri*, how can the author be sure that the Kananaskis examples at 4,000 feet (5,000+ of Colorado), were not *Uhleri*? It is altogether probable they were. On p. 467, a new species called *Alberta* is described, from Calgary. It is a curious thing that this *Alberta* is put between *Ællo* and *Chryxus*, though it is said to "bear the greatest superficial resemblance to *Taygete*." Now, on comparing the description of *Alberta* with the plate and description of *Varuna*, in B. N. A., Vol III., these two cannot be distinguished from each other. Mr. Fletcher tells me he sent me an example of this *Alberta* a year ago, and I returned it labelled *Varuna*. Really this is too too! Why then all this jumble about three other non-allied species?

Mr. Elwes does not think that *Semidea* is found in Labrador; at least he has seen no specimens from that quarter. Here I am pleased to say that I agree with him, as I have never seen a *Semidea* from Labrador. But he has no doubt that a specimen in Mr. Lyman's collection from Hudson's Strait is *Semidea*. Similarly I have a single example, a female, taken at Fort Chimo, Hudson's Strait, that I consider to be *Semidea*. The species will be fully illustrated in Pt. 15, B. N. A., Vol. 3, soon to issue. What Möschler distributed as *Semidea*, from Labrador, was *Æno*, Boisd., and *Æno* is the species taken on the peaks of Colorado. *Assimilis* is a variety of *Æno*, taken in both localities. It is without a band on under hind wings, or almost none. I have treated fully of these forms in Part 14. Mr. Elwes continues, p. 473: "All authors who have yet examined specimens of the form occurring in Colorado seem to agree in identifying them with the typical White Mountains *Semidea*, but, on comparing a series of five pairs from each locality, I can certainly pick out the Colorado specimens by the following characters," etc., etc.; closing thus: "I certainly think there is good ground for looking on it as an incipient species." It is identical with Labrador *Æno* beyond a doubt.

This brings us to *Subhyalina*, Curtis, p. 475:—"I have had more difficulty in dealing with the synonymy of this species than any other, but, after having compared the unique type of *Subhyalina*, Curtis, in Guenee's collection, kindly lent me by Mr. Oberthur, the figure of *Crambis*, given by Freyer, the type of *Assimilis*, in the British Museum, and several other specimens in the British Museum from various parts of Arc-

tic America, as well as from Hudson's Straits, I have come to the conclusion that it is impossible to distinguish more than one species. *It is true that the variations in size, colour and distinctness of the band on the hind wing below are great*, but not greater, or even so great, as that found in some other species I have already dealt with," and so on; "this opinion is confirmed by Mr. J. Edwards's examination of the clasps of some of the specimens differing most remarkably in appearance, *including the type of Subhyalina*, in which, fortunately, a critical examination is possible without dissection." I assert that the author here is totally wrong, and that he has mixed up two, if not three species, and I deny that the example in the Oberthur collection is the type of *Subhyalina*, Curtis. Curtis described a single male, no other example taken, which, he says, he thought at first sight was an old and faded specimen of *Hipparchia Rossii*, just before described. But, on examination, "it proved to be in good condition." He says it is black and the wings are semi-transparent, and the name *Subhyalina* implies that it is nearly transparent. Hyaline, in the dictionary, is given as glassy, transparent. Now, *Crambis* is a comparatively opaque species, and no more hyaline than are the leathern wings of a bat. *Aeno*, Boisduval, is somewhat translucent, about as much so as *Semidea*, not transparent, like *C. Brucei*, which is a sub-hyaline species. Neither of these has the peculiar appearance which led Curtis to think it old and worn. *Crambis* is dark brown, *Aeno* is brown, varying from livid to yellow-brown. Boisduval, *Icones*, p. 195, describes the color as "un gris-brunatre-livide melé de jaunatre." *Assimilis*, as I have said, is an unbanded form of *Aeno*, and was described by Mr. Butler in his *Catalogue of Satyridæ*. I sent two examples, one quite unbanded, the other partly, to Mr. Butler, and he pronounced them his *Assimilis* "undoubtedly." It is found wherever *Aeno* flies, and copulates with *Aeno*. *Subhyalina* was taken in 1830, described in 1835. In course of sixty odd years the chances are against the survival of any particular cabinet insect. It has a hundred enemies, beside the possibility of accident. It is not an unknown thing for the owner of a collection of insects, when a type is destroyed, to attach the label to another example that seems near, or pretty near, the original. He knows of the accident, and of the shifting of the label, and would explain it if circumstances rendered it necessary. But he dies, and his collections pass to another hand, and no one notices the discrepancy between the description and the supposed type. It is the rule that when description and type are found to be antagonistic, the latter must be ig-

nored, and the description alone is the guide. We may be very sure that Curtis never described a brown, semi-opaque, or a yellow-brown semi-translucent insect as sub-hyaline; nor would he have given the name of black to those very different hues; nor would brown and yellow-brown insects have shown the worn and faded appearance of which he speaks, and yet have been said by him to be "in good condition." To reduce *Crambis* or *Æno* to a worn and faded appearance, a pretty complete abrasion of the wing-scales would have been required. It is impossible that the Oberthur insect should be the type described by Curtis. Moreover, Boisduval described *Æno* in 1832, and if it and *Subhyalina*, Curtis, were the same species, *Æno* would have the priority. The history of this Oberthur specimen is this: after Curtis's death, Mr. Henry Doubleday purchased the types of Curtis's Arctic butterflies, and gave them as a present to M. Guenee. And my informant adds, "I think it quite possible that the label may have been displaced. It is even possible that Curtis did not label his types, and that Doubleday may have done the work after Curtis's death, and done it incorrectly. At any rate, if the supposed type does not answer to the description, it is tolerably certain that the type label cannot belong to it. M. Guenee hardly touched the diurnal Lepidoptera, he was essentially a student of the Heterocera. You ask, Why was not the type in this case placed in the British Museum? Probably Doubleday did not attach the importance to type specimens which we do now-a-days."

I will quote here a few lines from a well-known paper of twenty years ago, by the lamented W. Arnold Lewis, entitled "A Discussion of the Law of Priority," 1872. On p. 23: "Now, let us see what real assistance in the way of achieving certainty entomologists can obtain from inspection of type-specimens. He who examines an author's types may find them just as the author placed them, and bearing his labels. On the other hand, he may find them sorted and re-arranged, without labels or fresh ones. * * * He may find the author's labels affixed to species for which they were not meant. Dr. Staudinger says: 'It happens that authors after having created species afterwards mix up in their collections, together with the originals, species which are very near to them,' and Mr. Dawson says: 'Suppose Stephens's collection, instead of coming to us direct from the hands of its compiler and owner, three years ago, had become antiquated, like the Linnean; or suppose the

question of the types to be discussed some 60 or 70 years hence, with no more definite knowledge on the subject to assist the inquirer than the Stephensian types and the Stephensian descriptions would supply; might it not be argued that the types (in the cases under discussion) must be ignored, as they never could have been intended to represent the true Loppa pulicaria, Steph, because they are antagonistic to the description?"

Again, quoting Dawson: "Dr. Schaum invariably refers to the Stephensian types; my references are frequently given to Stephens's works, irrespective of the types. Now we are well aware that these do not always correspond, but that, on the contrary, considerable difference is often to be found between them.

"Before the Linnean collection was placed in its present quarters, it was so maltreated by additions, destructions *and displacement of labels*, as to render it a matter of regret that it now exists at all."

I must express my astonishment that the author of this Revision should have undertaken to overturn the work of two generations of entomologists, and to mix up several species as one by reference to a single type insect, taken 64 years ago, represented, as he should at once have seen, by a bogus specimen!

The description of Curtis, on which is our sole reliance, applies closely and almost exactly to the species taken at Laggan, and to which Mr. Elwes gives the name of *Beanii*. It is sub-hyaline, as much and perhaps more so than *C. Brucei*. It is pale black, and it has the faded and worn appearance mentioned by Curtis, particularly so by its clouded and smoky underside. The other markings agree well with his description. I described this species as *Subhyalina*, Curtis, in CAN. ENT., XXV., p. 137, 1893, and in Part 15, Vol. 3, B. N. A., it will be fully illustrated. The reading of this so-called Revision convinces me that I was and am right.

In Part XIV. I gave the series of the American species thus: 1 *Crambis*; 2 *Brucei*; 3 *Aeno*, and its var. *Assimilis*; 4 *Semidea*; 5 *Subhyalina*; rejecting *Also* as not American, and I hold to this to-day.

On p. 459, *Chionobas Stretchii*, Edw., is excluded from consideration, on the ground that it is the same thing as *Hipparchia Ridingsii*, "of the same author." As the fact that *Stretchii* was not a *Chionobas* has been known for many years, and published in my catalogues, it was not necessary to refer to it in the Revision. But I will take this opportunity to say that the types, a single pair, have disappeared. They were returned by me to Dr. Behr, after description, 1870. I did not consider them *Ridingsii* then, of course. Now, on comparing the description with that species, I am sure it is not *Ridingsii*. Nor is it *Dionysius*, the other of the known American species of Neominois. Mr. Bruce has suggested that it may be a third species of the genus, inhabiting Nevada (whence the types came) and the deserts of N. E. California, a region thus far wholly unexplored by naturalists. Mr. W. G. Wright goes there with a party of botanists and ornithologists the coming summer, and I trust he will re-discover *Stretchii*.

The value of publications of the class of the Revision under view depends much on whether or no the author is thoroughly acquainted with his subject, and such acquaintance implies considerable experience as a lepidopterist, and study of the forms he undertakes to speak of. He should have an eye for specific differences, and while this comes in part by training, it is largely a natural gift. Some lively workers go all their days without having this originally or attaining it. He should have made himself acquainted with the preparatory stages of as many of the species treated of as possible, for there never will be a final, authoritative revision of any genus of butterflies whatever till these stages in every species of it are known. Species are clearly distinguished by the form and sculpture of their eggs, by the forms and appendages of the caterpillars, and by the peculiarities of the pupæ, as by the facies of the imago. No man can speak with authority who relies simply on the facies of the imago. This feature has been the occasion of the endless and irreconcilable differences that prevail in nearly all genera up to this day. To proceed further in the same direction is plainly a waste of time. It is a case of the blind leading the blind to undertake to bring order out of the confessed confusion by appealing to facies. Add to the qualifications I have enumerated an acquaintance with the behaviour, habits of flight, and localities of the species, either from personal observation or reliable reports of thoroughly good observers. When an author has this equipment he may with good reason undertake to revise genera, and his decision will be respected.

PREPARATORY STAGES OF LAPHYGMA FLAVIMACULATA,
HARV., AND OTHER NOTES.

BY HARRISON G. DYAR, NEW YORK.

Laphygma flavimaculata, Harvey.

Determined by Prof. J. B. Smith. Eggs of this species occurred to me in the Hawaiian Islands at Kaawaloa, Kona, Hawaii and at Honolulu, Oahu.

Egg.—Nearly spherical, flattened at base, densely striated vertically; of a flesh-coloured tint, and covered with gray down; diameter, 0.6 mm. Deposited in a large mass on a grass stem.

First stage.—Head rounded, slightly bilobed, shining black, labrum whitish; width, 0.3 mm. Body small, the feet perfectly normal, the thoracic ones black, the others whitish like the body. Warts arranged much as in *Arctia*, concolorous with the body, inconspicuous, each with a single stiff black hair. Larva walks rapidly, with a slightly geometri-form motion.

Second stage.—Head shining blackish-brown, much paler in front over the clypeus and mouth; width 0.55, mm. Body enlarged at joint 12; bluish green, the tubercles distinct, black, each with a black seta. Dorsal, subdorsal and lateral whitish lines, distinct, even; subventral space whitish, but with no distinct line. Feet normal, all pale, the thoracic ones slightly testaceous. Cervical shield largely shaded with black or brown.

Third stage.—Head dark brown, nearly black, shining; a paler stripe over the ocelli; a few hairs; width, 0.8 mm. Body blackish-green; distinct dorsal, subdorsal and lateral pale green lines, the lateral one narrower than the others. Subventral space and venter pale, defined above by a pale green subventral band, which contrasts with the dark colour of the dorsum, but is only a shade lighter than the venter. Piliferous dots black, distinct, each with a minute black seta.

Fourth stage.—Head entirely black; width, 1.2 mm. Body velvety black, green centrally on the venter, with very narrow, broken, double dorsal, single subdorsal and lateral, and broad, greenish-white subventral lines, the latter not reaching to the last segment. Setæ short, black, the dots no longer distinguishable. Feet pale green, tipped with blackish. Spiracles white. The larva curls spirally when at rest.

Fifth stage.—Head shining black, a little mottled with pale brown on the sides; width, 1.8 mm. Body deep sooty black; the space between

the two narrow dorsal lines is paler, giving the appearance of a broad, pale band with defined edges; subdorsal line triplicate, narrow, faint; lateral line single, more distinct than the others; subventral one not broad, but distinct, yellowish with a green shade centrally. Spiracles white. Venter pale green; feet pale, all tinged with testaceous.

Sixth stage.—Head rounded, shining black, the sutures of clypeus and antennæ white. A pale brown, mottled lateral band. Width, 2.7 mm. Body sooty black to the venter, which is pale whitish, tinged with red, the subventral region less deeply black than the dorsal. On joint 2, a distinct, narrow, white dorsal and subdorsal line, the dorsal absent on the rest of the body. A super-stigmatal, fine, white line, with a series of five very narrow, faint lines above it bluish-white, and broken minutely into dots. Above these two more lines, further apart than the five are from each other, more distinct and continuous. The upper one of these lines joins the subdorsal line on joint 2, but is much narrower than it is. Spiracles white. Subventral line broad, its edges irregular; pale yellow with a central dull greenish or reddish shade. Subventral space mottled with yellowish. Feet pale, greenish outwardly and tipped with reddish. Setæ present, short, dark. As the stage advances, the dorsal line appears, resembling a shining black band against the sooty black ground colour. Subventral space blackish, densely mottled with round, pale spots.

At end of this stage the larvæ enter ground.

Pupa.—Of normal shape; cremaster of two separate, rather distinct, slender points, directed backward. Colour uniformly light brown. Length, 13 mm.; width, 4 mm.

Food plants.—Grasses.

Teniocampa pacifica, Harvey.

Four stages observed (full number, six?) with the following widths of head:—1.1 mm., 1.5 mm., 2.[2] mm., 3.2 mm.

Mature larva.—Head whitish-green with a few black piliferous dots. Body enlarged at joint 12; feet normal in all the stages observed. Body green, speckled with white; piliferous dots small, black. Narrow dorsal, faint subdorsal, stigmatal and faint subventral white lines, the upper two connected on joint 12 by a broad white band on the hump. The stigmatal line passes on to the anal feet. A white line on anterior edge of cervical shield. Another larva, probably the same, had its head brownish-testaceous, mottled with whitish, clypeus whitish, with a large black shade on each side. Body velvety brown, darker on the anterior portion

on the segments and minutely mottled with pale. A very broad, distinct, white stigmatal line, enclosing the black spiracles and shaded faintly on each segment with pink and yellow, passing very narrowly on to anal foot. On joint 12, on the anterior part of the hump, a dark brown subdorsal shade, defined on its posterior side, diffuse before. There are traces of dorsal, subdorsal and lateral whitish lines. Found on maple and wild cherry.

Larvæ from Yosemite, California.

Forms a firm cell in the ground without silk.

Xylina oregonensis, Harvey.

Head moderately bilobed, smooth, shining green, mottled obscurely with yellowish-green; mouth parts pale, whitish; jaws dark; ocelli brown; width, 3.7 mm. Joint 12 not enlarged; joint 13 small. Lustreless yellowish-green, closely covered with little, short, irregular yellow lines, resembling mottlings. Narrow, broken, almost dotted dorsal, subdorsal and stigmatal lines, the latter passing obscurely on to anal foot. Lines of equal width and much resembling the mottlings. Spiracles small, white with narrow black edge. Piliferous dots distinct, white, each with a single, short, pale seta. Tips of abdominal feet pale. Later in the stage the markings become more distinct, the stigmatal line pale yellow, spotted with red.

Food plant.—Oak (*Quercus Kelloggii*).

Determined by Prof. Smith from two crippled specimens.

Xylomiges perlubens, Grote.

Egg.—Spheroidal, flattened, closely reticulated, the depressions between forming vertical rows, at the micropyle forming a radiating circular row of smaller cells. There are about 40 rows around the egg. Colour, sordid, pearly white, not shining; diameter 0.7 mm. Laid in a mass, two layers deep, on the back of a leaf.

First stage.—Head pale testaceous, shining; mouth brownish, eyes black; width, 0.3 mm. Body pale whitish, subtranslucent, with large black piliferous dots. Only the last three pairs of abdominal feet are distinct, and the larvæ "loop" about very actively.

Second stage.—Head pale whitish testaceous, densely spotted with black; mouth brown; width, 0.5 mm. Body pale, soft green, joint 12 enlarged, the two anterior pair of abdominal feet smaller than the rest. Piliferous dots large, black. A broad, evident, white stigmatal line, besides narrower dorsal, subdorsal and lateral ones. Setæ black.

Third stage.—Head pale white, with large, black, piliferous spots; width, about 0.9 mm. Body blackish green. Lines white, the stigmatal a little greenish centrally. Piliferous spots large, black, faintly encircled with white.

Fourth stage.—As before. Width of head, 1.2-1.4 mm. A broad, dull red band appears in the centre of the stigmatal band.

Fifth stage.—Head shining pale whitish, reticulated with brown, and bearing a number of large, black piliferous spots; ocelli black; a blackish streak at vertex of each lobe; width 1.9 mm. Body dull green, heavily mottled with black, especially at the sides, where it is nearly entirely velvety black. Dorsal and subdorsal lines narrow, white; stigmatal line sordid reddish, bordered above and below by white. Piliferous dots black, with white centres. Feet pale.

Sixth stage.—Head pale whitish, with a tinge of green, a patch of brown reticulations on each lobe, bordered above and below by a broad, dark brown streak; a number of large, black piliferous dots; width 2.8 mm. Body enlarged slightly at joint 12, feet normal, joint 13 divided by a distinct suture. Colour blackish-green, consisting of black reticulations on a greenish ground. A narrow, black-edged, white dorsal line, interrupted by a series of black intersegmental shades, double on joint 12; a reddish tinge subdorsally; a narrow, black-edged, white subdorsal line; a broad, black, lateral shade; a broad, dull red stigmatal band, bordered with white. Venter paler, mottled with brown. Piliferous dots white, the subventral ones black. Feet pale. Setæ pale, about 1 mm. long. Spiracles white, with a narrow black edge.

Seventh stage.—As before, but the piliferous dots smaller, and the green colour is nearly all replaced by a pale brown.

Cocoon.—A cell in the ground with compact hardened walls, without any web.

Pupa.—Cylindrical, abdomen slightly enlarged centrally, cases moderately prominent; a slight depression between thorax and abdomen. Cremaster very short, consisting of two fused spines, separated at their tips, and two others outside of, but in line with these. Colour light brownish-yellow, unicolorous, but darker in the abdominal sutures. Length of pupa, 14 mm.; width, 5.5 mm.

Food plant.—Wild gooseberry (*Ribes*).

Prof. Smith has kindly determined the moth from some imperfect, undeveloped specimens.

TWO MORE OF WALKER'S "BOMBYCIDS."

Col. Chas. Swinhoe, of Oxford, has very kindly employed an artist to draw figures of *Heterocampa thyatiroides*, Wlk., and *Cingilia humeralis*, Wlk., for me. The latter is a synonym of *Caterva catenaria*, Cram., though I presume that the genus *Cingilia* (Trans. Ent. Soc., Lond. (3), i., 76, 1862,) antedates *Caterva* (new check list, 1882), and this geometrid must be called *Cingilia catenaria*. It stands in the Liparidæ in Kirby's catalogue. The other name antedates its synonyms, and we have:—

DASYLOPHIA THYATIROIDES, Walker.

1862—Walker, Trans. Ent. Soc., Lond., (3), i., 79.

interna, Packard.

1864—Packard, Proc. Ent. Soc., Phil., iii., 363.

tripartita, Walker.

1865—Walker, Cat. Brit. Mus., xxxii., 419.

signata, Walker.

1865—Walker, Cat. Brit. Mus., xxxiii., 758.

THREE NEW WEST AFRICAN MOTHS.

BY GEORGE A. EHRMANN, PITTSBURGH, PA.

Syntomis hilda, n. sp.

♂.—Antennæ, head and thorax black; first and fifth segments of the abdomen white, the rest metallic green; primaries dark brown with three ovate vitreous spots on the sub-apical area; discal space has two large triangular vitreous spots, the largest being near the inner margin.

Secondaries dark brown, with two small elongate vitreous spots near the base and one small round spot of the same colour in the discoidal area. Underside the brown is a little lighter than above, otherwise it is the same.

♀.—Similar to the male, except that the antennæ are tipped with buff, and the fifth segment of the abdomen is not white, thus leaving the whole abdomen metallic green except the first segment, which is white on the upperside; the vitreous spots in the wings are the same as in the male, but much larger.

Underside same as above, except that there is a large white spot on each side of the thorax, and the first two segments of the abdomen are creamy white; legs in both sexes are dark shining brown. Exp. of ♂, 14 mm.; ♀, 16 mm.

One male and three females in my collection. This lovely species was first taken by Mrs. Hilda Nasmyth at Cape Palmas, Liberia, West Africa, and I esteem it an honour to name it after her.

Syntomis abdominalis, n. sp.

♂.—Antennæ deeply pectinated; head and thorax black. Colour black, suffused with blue metallic scales. Primaries dark brownish, opaque, with two large oval semi-transparent spots in the discoidal area, the largest towards the inner angle.

Secondaries black without any ornamental markings whatever; abdomen deep maroon, except the two last segments, which are black. Underside the same as above, except that the entire abdomen is light carmine, and has a very narrow black lateral stripe on each side; legs light brown. Exp., ♂, 18 mm.

Mr. G. B. Nasmyth has obtained but one example of this beautiful and unique species at Grand Ses, Liberia, W. Africa; the type is in my collection.

Pachypas Nasmythii, n. sp.

♂.—Antennæ fawn-brown, pectinations much darker; head and thorax fawn-brown; the latter with a darker brown stripe running its entire length, similar to that of *P. Honrathii*, Dewitz, and *P. subfascia*, Walker. Abdomen, on the upperside the first four segments are of a very light brown, the rest, including the underside, is of a lovely ferruginous colour. Primaries light brown, median limbal area dark or chestnut-brown; costal inner space slightly shaded with dark-brown, similar to the two darkish marks which are so conspicuous in *P. subfascia*, Wlk.; there is also a dark-brown band, almost black, running through the entire width of the forewing, but not inclined so much as it is in *subfascia*.

Secondaries, basal area whitish and thinly clothed with scales, which gives this space a semi-transparent appearance; the outer marginal space has a broad brown band, darker inwardly, but much lighter on the outer margin; anal margin the same colour as the basal area. Underside of thorax dark brown; the legs are of the same colour.

Underside of primaries, costal space as far as the limbal area, light fawn; limbal area dark brown, with some light shading in the apical space; basal part on the inner angle much paler than the rest of the wing. Underside of secondaries same as above, except that the costal area is shaded with ferruginous. Exp., $5\frac{1}{4}$ inches. Type in my collection. Habitat, Cape Palmas, W. Africa.

At first sight this noble creature bears a great resemblance to *Pachypas subfascia*, Walker, but having before me Dr. Dewitz's paper, which was published in the Nova Acta. Band, XLII., and which has an excellent figure of Mr. Walker's *subfascia* on Pl. 2, F. 12, I cannot believe otherwise than that I have a new and undescribed species to deal with; and I have named it in honour of its discoverer. Mr. Nasmyth took but two examples of this grand moth, which, I am safe to say, is the giant of the genus. One specimen is in my collection, the other in that of the Rev. Dr. W. J. Holland, Pittsburgh, Pa.

NEW NORTH AMERICAN TRYPETIDÆ.

BY D. W. COQUILLET, WASHINGTON, D. C.

Trypeta (Acidia) tortile, n. sp., ♀. Wholly yellow except a black dot above each wing; ovipositor brown; bristles black; scutellum bearing four bristles; thorax and abdomen shining; ovipositor flat, very broad, nearly as long as the last two abdominal segments. Wings hyaline, the anal cell, bases of marginal, sub-marginal, and of the first basal cell, also the apex of the second basal cell, yellow; a black spot on furcation of the second and third veins, and one on lower half of vein at apex of anal cell; a brown band commences on costa between apices of auxiliary and of first vein, and extends to the discal cell, going over the small cross-vein and continuing as a yellowish streak into the discal cell; a second brown band commences on the costa between apices of the first and second veins, and crosses the wing, passing over the posterior cross-vein, and near its terminus sending a spur into the third posterior cell; apex of wing from slightly before apex of the second vein to beyond tip of fourth vein, brown; first and third veins bristly. Length, 5 mm. Washington (O. B. Johnson). A single specimen.

The colouring of the wings somewhat resembles Figure 9, Plate X., of Loew's "Monographs," Part III., but the fifth vein is not bordered with brown; the brown at the apex of the wing is separated at the costa from the preceding cross-band; the band crossing the discal cell is scarcely perceptible, etc.

Trypeta (Rhagoletis) formosa, n. sp., ♂ ♀. Black, the head and its appendages (except the ocellar tubercle and occiput), a line reaching from humeri to each wing, scutellum except the sides at base, halteres and legs, yellowish; thorax and scutellum sub-opaque, the abdomen shining; proboscis slender, geniculate, the apical half bent downward; sides of front and scutellum each bearing four bristles; ovipositor compressed, slightly exceeding the last four abdominal segments in length; wings hyaline, marked with three cross-bands and two spots of brown, extreme base of wing smoky; the first cross-band begins at first vein and extends over veins at bases of discal and third posterior cells, stopping near middle of axillary cell where it is much widened; the second band begins on costa between apices of auxiliary and first veins and extends over small cross-vein, and through the discal and third posterior cells to the wing margin, its greatest width occurring at the fifth vein; a brown costal spot between apices of first and second veins, extending across marginal and

sub-marginal cells; the next band begins just before apex of second vein and crosses the wing, passing over the posterior cross-vein, widest and angled at the fourth vein, the band having the form of a bayonet; a brown spot fills apex of first posterior cell (except sometimes a spot in its extreme apex), and encroaches on the sub-marginal and second posterior cell; length, 3 to 4 mm. Southern California. One male and two females.

The wings somewhat resemble Figure 16, Plate IX., Loew's Monograph, but the first band is at apex of second basal cell, there is an additional brown costal spot between the second and third bands, the third band begins at apex of second vein, etc.

Trypeta (Aciura) aplopappi, n. sp., ♂ ♀. Black, the pleura largely brown, the head and its appendages, the legs except the coxæ, yellow, a brown vitta on outer side of front femora; knob of halteres bright red; bristles black, the short pile light yellow; front bearing four bristles each side, the scutellum bearing only two; abdomen shining, not bristly; ovipositor flattened only at apex, as long as last two abdominal segments; wings of nearly an equal width, dark-brown, the following spots whitish hyaline: two in costal cell, two in marginal cell beyond apex of first vein, the second spot extending half-way across the submarginal cell; one in first basal cell opposite apex of first vein, one in upper outer angle of discal cell, a basal spot and oblique streak crossing second posterior cell, five in third posterior cell, three of which are on the wing margin; from two to four in axillary angle; first vein bristly, the others bare; length, 4 mm. Southern California. Three males and two females, which issued in April and May from irregular galls, about 8 mm. long by 4 in diameter, on the smaller branches of *Aplopappus pinifolius*.

The wings are very similar to Figure 8, Plate X., of Loew's Monograph, but there is no hyaline spot in the first posterior cell, only one in the first basal, axillary angle not wholly hyaline, etc.

Trypeta (Carphotracha) cultaris, n. sp., ♂ ♀. Agrees in all respects with Loew's description and figure of *culta* (Monographs, etc., III., pages 276 to 279) with these exceptions: Ovipositor not longer than the last three abdominal segments; wings having only one brown ray between apices of second and third veins; no darker spot in second posterior cell; length, 6 to 7 mm. Southern California. One male and two females, in January.

These differences are constant in the numerous specimens examined but not now before me. So far as I am aware, the typical *culta* does not occur on the Pacific coast.

Trypeta (Neaspilota) signifera, n. sp., ♂ ♀. Yellow, dorsum of thorax and metanotum except the sides, opaque grayish-black, the abdomen sometimes brown; front bearing five bristles each side, the scutellum bearing four; ovipositor flattened, as long as the last three abdominal segments; wings hyaline, basal half or less of space between apices of auxiliary and first vein brown; first vein bristly, the others bare; length, 3 mm. Southern California. Six males and one female.

The wings are like Figure 10, Plate XI., of Loew's Monograph, except that the apex of the stigma is broadly hyaline.

Trypeta (Tephritis) baccharis, n. sp., ♂ ♀. Yellowish-brown, base of each abdominal segment and spot each side of middle of metanotum, dark grayish-brown; front bearing four bristles each side, scutellum also bearing four bristles; wings narrow, of nearly an equal width, opaque white mottled with brown, which is broken up into spots, except a border on the apex beginning between apices of first and second veins and extending nearly to axillary angle, where the brown is very faint; along the wing margin this border contains a white spot in each angle of the sub-marginal cell, entire apex of the first posterior cell, three spots in apex of second posterior cell, and seven between this cell and the axillary angle; the brown spots form an indistinct broad band, reaching from the stigma to the wing margin at lower end of the posterior cross-vein; first vein bristly, the others bare; length, 5 mm. Southern California. Nine males and seven females, which issued from January to April from irregular oval galls about 12 mm. long by 4 in diameter, on tender twigs of *Baccharis viminea*.

The wings somewhat resemble Figure 5, Plate XI., of Loew's Monograph, but are much paler, the darker portions forming two cross-bands, one near the middle, the other at the apex of the wing.

Trypeta (Euaresta) Californica, n. sp., ♀. Black, the head and its appendages, corners of thorax, margin of scutellum, large spots on pleura, and the legs, yellowish, halteres pink, pleura near the wings, and bases of the latter, tinged with pink; thorax and scutellum opaque gray pollinose, abdomen glabrous, shining; front bearing four bristles each side, the scutellum bearing only two; ovipositor longer than the last three abdominal segments, over three times as broad at base as at the apex; wings

brown, the following spots hyaline: four in costal cell (none between apices of auxiliary and first veins); three in marginal cell, situated between apices of first and second veins, three in sub-marginal cell of which one is contiguous to the middle spot in marginal cell and two are between apices of second and third veins; three in first posterior cell, the one in the apex reaching the wing margin, three in second posterior cell, all of them contiguous with the wing margin, four in third posterior cell, of which three are along the wing margin; three in axillary cell, two in the second basal, two in first basal, of which one is sub-basal and the other near its apex, also one in discal cell near its apex; first vein bristly, the others bare; length, nearly 4 mm. Southern California. A single female, in May.

The wings closely resemble Figure 23, Plate X., of Loew's Monograph, but there is only one hyaline spot in the discal cell, four in the third posterior, etc.

Trypeta (Euaresta) araneosa, n. sp., ♀. Grayish-black, the head and its appendages (except a portion of the occiput), halteres and legs except sometimes a portion of the femora, yellowish; bristles black, the short pile yellowish; front bearing four bristles each side, scutellum bearing four bristles; wings brown, the following spots hyaline: three in costal cell nearly filling that cell (none between apices of auxiliary and first veins), four in marginal cell, of which two are near the base and two between apices of first and second veins; five in sub-marginal cell, of which one is at the base, two near the middle and two between apices of second and third veins; five in first posterior cell, the one in the apex reaching the wing margin; three in the second posterior cell, each of which crosses that cell; four in third posterior cell, from four to seven in the discal cell, one of which touches the vein at the base of that cell; and three in first basal cell; second basal, anal and axillary cells largely hyaline; first vein bristly, the others bare; ovipositor scarcely longer than the last abdominal segment; length, 4 mm. Southern California. Four females, in January and February.

The wings somewhat resemble Figure 21, Plate X., of Loew's Monograph, but the stigma is wholly brown and the base of the wing to apex of auxiliary vein is almost wholly hyaline, excepting a brown streak crossing the third posterior cell near its base.

Trypeta (Euaresta) stelligera, n. sp., ♂. Black, the head and its appendages (excepting the occiput) the halteres and legs, yellow; thorax

and scutellum gray pollinose, the abdomen glabrous, shining; front each side and the scutellum bearing four bristles; wings brown, the following spots hyaline: four in costal cell (a yellow dot on costa just beyond apex of auxiliary vein), two in marginal cell situated between apices of first and second veins, three in sub-marginal cell, of which two are between apices of second and third veins and the third is contiguous to the first spot in marginal cell; three in first posterior cell, the one at apex reaching the wing margin; four each in second and third posterior cells, three in each cell reaching the wing margin; three in first basal cell, of which two are near its base and the other near its apex; and one in discal cell near its apex; second basal, anal and base of axillary cells largely hyaline; first vein bristly, the others bare; length, 4 mm. Southern California. A single male specimen.

The wings resemble Figure 23, Plate X., of Loew's Monograph, but there is no hyaline spot just before apex of second vein, only one in the discal cell, etc.

Trypeta (Euraesta) tapetis, n. sp., ♂ ♀. Yellowish, the dorsum of thorax, lower part of pleura, metanotum and ovipositor, black, the abdomen sometimes marked with blackish; scutellum bearing four bristles; wings brown, the following spots hyaline: two in costal cell, one between apices of auxiliary and first veins; four or five in marginal cell, of which two or three are between apices of first and second veins; four in sub-marginal cell, of which two are between apices of second and third veins, that at tip of second vein encroaching on the marginal cell; four in first posterior cell, of which one is near the base and three near its apex, one of the latter spots sometimes being divided into two spots; three in second posterior cell, each reaching the wing margin, but two of these spots are sometimes merged into one; four in third posterior cell, three of which reach the wing margin; three in first basal cell, and two in discal cell, of which one is near its base and the other near its apex; second basal, anal and base of axillary cell largely hyaline; first vein bristly, the others bare; length, 4 mm. New Mexico (E. L. Keen). Four males and two females.

The wings somewhat resemble Figure 28, Plate X., of Loew's Monograph, but the hyaline spots are larger and more numerous, some of them merging into each other so as to form a cross-band, beginning just before apex of auxiliary vein, and reaching the wing margin just beyond apex of sixth vein.

THE ODONATA OF ITHACA, N. Y.

BY NATHAN BANKS, SEA CLIFF, N. Y.

Most of the species recorded below were collected by the writer in the vicinity of Ithaca, N. Y., during the years 1838 and 1889. I have seen the collections of others, and have found in them some forms that I had not collected. I have also examined the collection of Cornell University, and found several species not previously seen from the locality. This list is not complete, as undoubtedly more species will be found in the Cordulidæ and Gomphidæ. I have added a few notes on certain species and genera, which I thought opportune:—

CALOPTERYGIDÆ.

Calopteryx maculata, Beaur. Common about streams during spring and summer.

Heterina americana, Fabr. A specimen was taken during the past summer by a Mr. Salant.

AGRIONIDÆ.

Lestes hamata, Selys. Uncommon, August.

Lestes rectangularis, Say. Common during July and August.

Lestes disjuncta, Selys. Uncommon, August.

Lestes forcipata, Ramb. Not common, June.

Argia violacea, Hagen. Common, July.

Argia putrida, Hagen. Common, summer.

Ischnura verticalis, Say. Common, July, August.

Amphiagrion saucium, Burm. One specimen.

Nehalennia irene, Hagen. Uncommon, July.

Erythromma condita, Hagen. One specimen.

Enallagma exsulans, Hagen. Quite common, July, August.

Enallagma Hageni, Walsh. A specimen in the Cornell Univ. collection is probably this species.

Enallagma ebria, Hagen. This has the superior appendages of ♂ deeply bifid, more so than in *E. civile*, the upper branch no longer but a little larger than the lower. A black spot above on segment two, and the black of segment three confined to the tip. Two specimens.

Enallagma annexa, Hagen. The ♂ has the apical black spot on segment two, and the apical halves of three, four and five are black; eight and nine are blue. The superior appendages rounded, blunt at apex, inferior pointed, as long as the superior. Two specimens, August.

These, together with those recorded and described by Calvert in his recent paper on the Odonata of Philadelphia, are all the species of this genus found in the northeastern part of the United States, except *E. traviata*, Selys. This was described from Mass., I have collected a specimen on Long Island, N. Y. It is hardly more than a variety of *E. aspersa*. The superior appendages are like *E. aspersa*, except the lower branch is a little heavier; the black on segment two has a projection to the anterior margin of the segment, and the black on segment three also reaches to the anterior margin in a point; apical half of seven, all of eight and nine and all of ten, except black spot above, blue. I have also taken *E. divagans* on Long Island.

GOMPHIDÆ.

Ophiogomphus rupinsulensis, Walsh. I took two specimens.

Dromogomphus spinosus, Selys. One specimen in Cornell Univ. collection labelled "N. Y.,"; it is probably from Ithaca. It has been collected quite commonly at Baldwinsville, N. Y., by Mr. R. H. Pettit.

Gomphus fraternus, Say. I have but one specimen.

Gomphus villosipes, Selys. Not uncommon.

Gomphus exilis, Selys. Quite common in June and July.

Gomphus parvulus, Selys. One specimen.

Gomphus, sp. A specimen (♀) in Cornell Univ. collection, unknown to me.

Hagenius brevistylus, Selys. A specimen in the Cornell Univ. collection.

ÆSCHNIDÆ.

Anax junius, Drury. Common during summer.

Neuræschna vinosa, Say. I have one specimen, 29 July.

Æschna heros, Fabr. In Cornell Univ. collection, June.

Æschna constricta, Say. Common during July and August.

Æschna clepsydra, Say. Uncommon, August.

CORDULIDÆ.

Macromia transversa, Say. Uncommon, June, July.

Epitheca elongata, Scudd. One specimen in Cornell Univ. collection, June.

Cordulia princeps, Hagen. In Cornell Univ. collection, June.

Cordulia cynosura, Say. Common in the spring.

Cordulia semiagrea, Burm. In Cornell Univ. collection labelled "N. Y."; it is probably from Ithaca; Mr. Pettit has taken it at Baldwinsville, N. Y.

Cordulia, sp. ? I have an abnormal female near *C. cynosura*, but the hypertriangular space of forewings crossed, the sectors barely united at apex; all the triangles crossed, no internal triangle to hind wings, three or four veinlets under the pterostigma, black spots at base of the wings, abdomen shorter than hind wings, sides of thorax without any stripe. This and *Nannodiplax vacua* may serve to illustrate how fickle are the venational characters in this family; it would be better, I think, to draw generic characters from the head and thorax.

LIBELLULIDÆ.

Tramea lacerata, Hagen. I saw two specimens of this species at Freeville (a town ten miles from Ithaca), May 31, 1889; after much trouble I captured one of them.

Celthemis elisa, Hagen. One specimen collected by Prof. Morgan.

Libellula quadrimaculata, Linn. A few specimens in the Cornell Univ. collection.

Libellula pulchella, Drury. Common during spring and summer.

Libellula basalis, Say. Uncommon, August.

Libellula trimaculata, De Geer. Common during spring and summer. This is usually placed in the genus *Plathemis*, which differs from *Libellula* only in the male genital organs, which, I think, are hardly worthy of generic rank.

Mesothemis longipennis, Burm. Common during spring and summer. I have a specimen with the triangles four-sided.

Mesothemis simplicicollis, Say. I have seen a specimen collected by Mr. O. Takahashi.

Diplax vicina, Hagen. Not uncommon, July, August.

Diplax rubicundula, Say. Common during spring and summer.

Diplax semicincta, Say. Uncommon, August.

Diplax intacta, Hagen. This is placed in the genus *Leucorhinia*, Britt., separated from *Diplax* only by structure of the vertex of head; the venational characters vary to the usual form of *Diplax*. Not uncommon in the spring.

NOTES ON NOCTURNAL LEPIDOPTERA.

BY A. R. GROTE, A.M., BREMEN, GERMANY.

THE SPECIES OF LITHOPHANE.

Prof. Smith says that he uses the name *Xylina* in preference to *Lithophane*, because both are catalogue names and *Xylina* has priority, since the Verzeichniss was not published until 1818 at least. My argument is, that Ochsenheimer took the name *Xylina* from Hübner's Tentamen (1808), cites Hübner and includes his type *lithoxylea*, which is not a *Lithophane*, but a *Hadena*. Consequently, *Xylina* or *Xylina* falls before *Hadena* and should not be used for this genus. I took *Lithophane*, because it thus has priority for this genus, and because it includes *socia*, which I designated as a type in 1874, being free to do so. It seems to me this course is clear. Ochsenheimer, as I have proved, admits the Tentamen as valid authority, and adopts Hübner's names out of it in a number of instances. The authority of the Tentamen is most certainly established by Ochsenheimer's action and its prior date proved. See my Buffalo list, and my papers in CANADIAN ENTOMOLOGIST on this subject. From an æsthetic point of view *Lithophane* is a more descriptive and a prettier name, although this is no argument and a mere opinion of my own. The fact is, that Ochsenheimer's *Xylina* is a mixed genus; its true type, since this author cites Hübner, is a *Hadena*. Thus it cannot, under the rules, be used for the present structural type.

I have little to add to what Prof. Smith says as to the synonymy of the species. I did not identify *signosa*, if I recollect rightly, from the collection, but while I was in Buffalo, from a study of the description in the British Museum Lists. If I made a mistake, as would now appear, it is an excusable one. But what I do not understand is Fernald's testimony, Bull. Geol. Surv., Vol. 5, 201, 1879. From this it appears that my *petulca* was "near, if not identical with Walker's *infructuosa*," a species now referred by Smith as a synonym of *confusa*, Hübner! An entirely different looking insect! Prof. Fernald does not mention my *signosa*, Walk., specifically, but says: "The only *Xylina* which I found in the Walkerean collection, under a different name from what they are known by us, was *Xylina antennata*, Walk. This is *X. cinerea*, Riley." I had only noted, in 1867, this gray species, but when I came to separate our gray forms, I found three of them, and the question was, which one of these Walker had. From my memory of the type and from Walker's description, I felt sure it was *cinerea*, and, in this instance, Prof. Fernald

is corroborated by Prof. Smith. I do not know whether Prof. Fernald had *signosa* with him, but one thing is clear, that if he had this or *petulca*, then he could not have failed to note the fact, if *petulca* was really identical with Walker's original type of *signosa*. He had *petulca*, and he considered it near or identical with *infructuosa*, Walk.! Now, has there been here any shifting of Walker's "types"? If Prof. Fernald had my *signosa* with him in 1879, then its correspondence with Walker's *signosa* would be proved inferentially by his general statement quoted above. If, again, he saw the type of *signosa*, he could not have failed to note its correspondence with the *petulca* he certainly had with him! Why did Prof. Fernald compare *petulca* with *infructuosa*, if Walker's "type" of *signosa* was *petulca*? As a matter of fact, what Walker says agrees better with *signosa* than with *petulca*; I have no sufficient material now before me to go into this point. Walker's description convinced me that he had what I call *signosa* before him when I determined and compared our species with his text, but I am aware that much better descriptions than Walker ever wrote are liable to be misinterpreted. Nor am I primarily interested to rescue my name. I wish to show reasons for assuming that the Walker collection is not now, in all its details, what it was before Mr. Butler took charge and merged my collection with it in 1883. And I insist that Walker's text must not conflict with the present "types" when we are called upon to identify the two. Perhaps, in the present case, Prof. Fernald has some additional information to that which he gathered for me and kindly communicated in 1879. At any rate, Prof. Fernald's published remarks (l. c.) should be read in the light of Prof. Smith's present references.

Lithophane unimoda, Lintner.—This may be a distinct species, but the single specimen I saw impressed me with the probability that it was only a dark, suffused form of one of the species of the *antennata* series.

Lithophane gausapata, Grt.—I believe the specimen was sent me by my friend Behrens. Why the type "should" be in Mr. Neumoegen's collection I do not know, except that I gave him all my material before leaving home. I believe he has it and also the type of *Mamestra ferrealis*, unless I gave it to some one else—Prof. Smith, perhaps.

Lithophane deposita, Morr.—The specimens in my collection, or, at least, one of them, came from Mr. Morrison, and are thus authentically named, if not "types." This same is true of *fagina* and *curvimacula* in my collection.

Lithophane oriunda, Grt.—If the "type" is not in British Museum, Prof. Saunders may have it. This species was, I believe, authentically determined by me for Mr. Geo. Norman, and his specimen may be in the British Museum.

Lithophane Bethunei, G. & R.—It is of little importance now, since the species is so well known, but I believe our type is in Philadelphia. Mr. Robinson gave our collection to the Central Park Museum, and Mr. Beutenmüller can probably testify as to what "types" of *Noctuidæ* it may contain. "Types," from which a figure was made, might lose their labels, and may not have been reclaimed by us.

Lithophane capax, G. & R.—I wish to mention this species because I took my own original material in 1867 with me to Vienna and showed it to Julius Lederer, the well-known European authority on the *Noctuidæ*, and asked his opinion on the generic location of the insect. He said of all the European genera the moth came nearest to *Xylina*. I have been of the opinion for a very long time that its position here was only tentative.

Euharveya carbonaria, Harvey.—When Dr. Harvey described this species, I very much doubted its reference to *Lithophane*. As I have lost the pleasure of naming a genus after him, through Mr. Walker's *Siavana*, I propose the present term for *carbonaria*, which Prof. Smith says affords a remarkable structural character. According to my view, the moth approached my genus *Ufeus*.

AGROTIS MURÆNULA.

I am not prepared to admit, without further study, the validity of the generic disintegration of the species of *Agrotis*. It does not seem to me probable, for instance, that *occulta*, for which I retained *Eurois*, Hübn., should be congeneric with *pellucidalis*. But all such questions, together with the proper names according to the rules which these new groups must bear, may be left to the future monographer. They do not affect the present case, which is this, that two species, properly referred by me at the time to *Agrotis*, were described by Walker under the same specific name *vetusta*. One of these turns out to be, as I had suggested in my essay, *muraenula*, G. & R., and this latter name, I claim, under the custom and as accepted in Staudinger's Catalogue, should be retained for the species it designates, since at the time it was free to be named and no subsequent generic separation can overturn its real and conceded right at the time it was proposed. *Vetusta*, Walk., as applied to *muraenula*, must be relegated to the synonymy.

AGROTIS OPIPARA.

When Mr. Morrison described his *opipara* and *scropulana* from Mt. Washington, I was working out the theory with regard to the influence of the Glacial Epoch, or Epochs, upon the geographical distribution of to-day of our lepidoptera. It was a matter of less interest that Mr. Morrison should have redescribed known species, than that these species from Mt. Washington should have a representation also far away in the higher latitude of Labrador, or that Labrador forms should be demonstrated to occur also on mountain peaks in New Hampshire. Mr. Moeschler sent me specimens of his *islandica* and *carnea* from Labrador, and when Mr. Morrison also sent me his "types" of *opipara* and *scropulana* I compared them and found the two species from Mt. Washington the same as the two from Labrador. I exhibited all these specimens at the meeting of the Entomological Club of the American Association for the Advancement of Science, and there is record of the fact in the CAN. ENTOMOLOGIST. I adopted then Mr. Moeschler's names for these insects, having no opportunity to go behind his determination and suspecting no necessity. Matters rested in this way until I had the opportunity, when I found, and was the first to find, that the real *islandica*, Stdgr., from Iceland was probably different from *islandica*, Moeschl., from Labrador, as well as from *opipara*, Morr., from Mt. Washington; the two latter being, as I had originally claimed, the same species. Accordingly in 1882, in my New Check List, p. 25, I called our North American species *opipara*, Morr., with *islandica*, Moeschler, in error, as a synonym. I added this note:—"This species from Mount Washington is identical with the Labradorian species determined by Moeschler as *islandica*. But I have doubts, since seeing an Icelandic specimen, as to whether Moeschler is right. In restoring *opipara* for this species I do not in the slightest way change my opinion as to the identity of the Mount Washington and Labradorian species." Nothing can be clearer than my words and action. I was bound to accept Moeschler's authority in the first instance since I could not but believe he knew Staudinger's species and Mr. Morrison knew neither that nor *carnea*. Eight years later comes Prof. Smith and (although I never had, at any time or anywhere, described any North American species as *islandica*, and although, whenever I mentioned the name, it was perfectly clear I was speaking of the species identified by Moeschler) cites after *opipara*, "*islandica*, Grote, in error." Prof. Smith goes still further. He

suppresses my reference of the species described by Moeschler as *islandica* to *opipara*, in 1882, as cited above, and has the courage to write "the error is Mr. Grote's for condemning Mr. Morrison's species on insufficient grounds!" By also suppressing Moeschler's original determination, I am brought in for a synonym I never committed! In effect what I really did was this: I identified the two species described by Moeschler from Labrador and Morrison from Mt. Washington as the same, which was a clear scientific gain. I am also the first to show that Moeschler's name for the species was the result of a wrong identification, and that our North American species must be called *opipara*, Morr., with *islandica*, Moeschl., nec. Stdgr., as a synonym! In 1885, three years after my rectification, Mr. Smith writes (Ent. Am., I., 14,) that "Mr. Moeschler's claim that *islandica* is found in Labrador is based on a variety which is certainly the *opipara* of Mr. Morrison." Here was the place to say that I had made the correction and arrived at the conclusion in my note printed in 1882! I think I may say that I have been anxious that every real mistake I have made should be rectified for the sake of science and that I have never shunned a just criticism. But, in view of facts like the preceding, it will appear that an author may allow himself to publish a criticism the reverse of just and without any apology for his conduct.

PACHNOBIA CARNEA.

It is a matter of comparatively little consequence now whether Mr. Morrison redescribed *carnea* or the closely allied *Wockei* from Labrador. If the supposed "type" in Tepper coll. is alone genuine, he will have redescribed the latter; if the two (?) specimens he sent me at the time are genuine "types," he will, I think, have described *carnea*. In order to make out the former the true case, Prof. Smith omits Mt. Washington as locality for *carnea* in his Revision, and gives it only to *Wockei*. I do not feel sure the two are really different and am quite certain Morrison did not distinguish them. He sent me at the time to Buffalo a cigar box half full of specimens, all "types" of his *scropulana*, for my opinion. I wrote him they were very beautiful, but varied so much I could not believe well they were all one species. I was instructed to return them at once and did so without taking them out of their places, retaining only one or perhaps two of the dingiest specimens, which were specially marked for me, and which, on comparison, I identified with *carnea*. Now, long afterwards, and without knowledge of the facts, Prof. Smith appears and writes as if he knew all about Morrison's "types," pronounces a

single one in coll. Tepper as genuine, while conceding elsewhere that Mr. Morrison was very liberal in labelling specimens as "types." To conclude, in the Synonymic Catalogue the locality for *carnea*, Mount Washington, reappears! On whose authority if not on mine based on Morrison's specimens? What has happened between the Revision and the Catalogue? Has Prof. Smith seen my specimens sent by Morrison and found them really *carnea*? In the Synonymic Catalogue several of my *Agrotis* species are reinstated, and perhaps finally my determination of these two Alpine forms may gradually come to be acknowledged. Where an examination of my collection has resulted in establishing my determinations so very largely, it seems hardly worth while to pursue the subject further. There remain but a few cases of specific determination where I am still of a different opinion from the author of the Synonymic Catalogue, and I reserve my views on these until a proper time.

AGROTIS EXSERTISTIGMA.

This species was described by Mr. Morrison on material furnished by me and credited to me, and I figured, in the Buffalo Bulletin, the specimens returned as "types" of *Exsertistigma* by Mr. Morrison. But it appears that one of my specimens was not returned me, that this specimen, also marked as "type" of *exsertistigma*, found its way into Mr. Tepper's possession, and that this specimen belongs to a species afterwards described by me as *observabilis*. It may be truly said that Mr. Morrison's original description was totally inadequate, and that therefore the species should remain as figured and determined by myself. There is nothing to prove the Tepper specimen the genuine one, and mine not genuine. My publication was the only sufficient one. Probably, almost certainly, Mr. Morrison considered them all the same, in which case my determination was decisive. If Mr. Morrison considered my specimens credited to me and Mr. Tepper's one species, I was free to determine one as *exsertistigma* and re-describe the other (of the existence of which in Mr. Tepper's collection I was, however, ignorant). I think, with justice, my original determination should prevail. But my original determinations have been overturned by Prof. Smith; only this author has overlooked the fact that his new name for my *exsertistigma*, viz., *confusa*, must fall before *Morrisonistigma*, proposed by me in Buff. Bulletin.

THYATIRA ANTICOSTIENSIS.

I would draw attention to the fact that this form of *T. pudens*, Guen., taken by Mr. Wm. Couper on Anticosti, is described by me, CAN. ENT.,

XVIII., 215, 1886. My specimen is, I believe, now in the British Museum, and, I think, unlabelled. It is apparently a hoary, boreal form of *prudens*, but may also be restricted to Anticosti. I have not had sufficient material to decide the question.

SPHIDA OBLIQUA, Walk.

Prof. Smith has shown that my identification of our *S. obliquata* with this species of Walker's is correct, and the species must be known as above. I separate *Sphida* from *Arzama*, or, as it must be now known, *Bellura*, on account of the clypeal tubercle, exactly as *Ochria*, Hübn., (= *Gortyna*, Auct.) is separable from *Gortyna*, Hübn., (= *Hydracia*, Auct.) As I use an acknowledged generic character, I do not see why it should here fail of recognition. In some way, now incomprehensible to me, I failed to see Walker's species in 1867, when I was there with a specimen to identify. The drawer may have been overlooked, or the species not then in place—probably the latter, as Mr. Walker was then employed in arranging the material. I saw then the type only of *Arzama densa*, and recognized it at once as allied to our species of *Sphida*. I did not then know *vulnifica*, which I described in 1872 in Philadelphia. I left my type there and there it must yet be. The type of *densa* did not recall to me *vulnifica*, which is more yellow; I have all along thought these were two species; one "reddish," smaller perhaps, *densa*, and another, *vulnifica*, differently coloured. Of this latter I regarded *melanopyga* as a variety with blackish anal tuft. I did not see the type of *Bellura gortynoides*, Walk., C. B. M., 32, 465; the description more resembles *vulnifica* than that of *densa* does. As I have not seen my type of *vulnifica* to compare with my material or with *melanopyga*, it should be found and studied. I have now myself no, or little doubt, we have to do with a single variable reddish on yellow species, and that Prof. Smith's synonymy will be found to be correct, p. 181, where the name is misspelled *gortynides*. (Other cases of miswritten names are: *tranquilla*, for *tranquilla*; *synochites*, for *synochitis*; *appassionata*, for *appassionata*, etc.) From this variable brighter coloured species, *Bellura diffusa*, Grt., is totally distinct. It has been collected by Mr. Moffat, I believe, in Canada. Where my type is now I cannot for the moment recollect. It seems not to be in the British Museum. A type of *Sphida obliquata* is or was in the Central Park Museum. The *Arzaminae*, then, are a group of noctuid genera with aquatic larvæ, having affinities with *Nonagria* and of a peculiar Bombycid appearance, owing to the tufted female abdo-

men, like *Lasiocampa*, *Ocneria*, *Bombyx*, etc., and soft brown colours. They are exclusively American and seem to be the survival of an ancient form of the family. The two genera may thus be catalogued :

BELLURA, Walk.

GORTYNOIDES, Walk.

densa, Walk.

vulnifica, Grt.

var. melanopyga, Grt.

DIFFUSA, Grt.

SPHIDA, Grt.

OBLIQUA, Walk.

Obliquata, G. & R.

A TERATOLOGICAL TRIO.

BY W. HAGUE HARRINGTON, OTTAWA.

For those interested in teratology I wish to record three instances of malformations of the antennæ of Coleoptera. The beetles presenting these have been kindly given to me by Mr. W. Simpson, an energetic and observant young collector of this city. The deformities exhibited are as follows :—

Fig. 6—*a*. Right antenna of a male *Dytiscus Harrisii*, in which the third joint is enlarged and broadened toward the tip and gives off two branches. The inner of these contains eight joints and is quite normal in appearance, but the outer consists of only two articles, of which the second is



FIG. 6.

short and irregular at apex, and does not seem to have had any more attached to it.

b. Right antenna of *Adimonia cavicollis*, in which the second joint is somewhat enlarged and gives off two branches. The inner branch consists of the full nine joints necessary to complete the organ, but these joints are all slightly shortened and broadened, and the branch has a sub-clavate appearance. The outer branch is imperfect; the first four joints are still more shortened, and are succeeded by two irregular articles, the first of which evidently represents at least two.

c. Right antenna of *Desmocerus palliatus*, in which the sixth joint is represented by a small wedge-shaped piece. The seventh is short and thickened, and is set at right angles to the fifth, thus making a sudden bend in the antenna. This malformation is probably due to an injury while the insect was in the pupa state, as indicated by fragments of skin which remained when the beetle moulted.

COCCINELLIDÆ OF DODGE CO., WISCONSIN.

BY WILL EDWIN SNYDER, BEAVER DAM, WIS.

Anisosticta strigata, Thunb. Very abundant, found under stones, bark and other objects in nearly all pasture and meadow lands. I have never taken it while feeding. A colony of over fifty was taken from under one stone the past summer.

Megilla maculata, D. G. Abundant—to be found nearly everywhere. Most abundant in the late fall in corn fields infested with the chinch bug. One of our earliest beetles to appear in the spring. Also to be taken during warm spells in midwinter, seven specimens having been taken on the eighteenth of January of the present year.

Hippodamia glacialis, Fab. I have two of this species taken from under bark of a stump in 1891. It is the only record I have of its occurrence here.

Hippodamia 13-punctata, Linn. Our most abundant species of the Coccinellidæ. Especially abundant in corn fields in company with *M. maculata*, *H. parenthesis* and *C. sanguinea*. Varies much in colour and markings. Doubtless very destructive to the chinch-bug, as it occurs most frequently in fields infested by it.

Hippodamia parenthesis, Say. Common, especially so among the loose bark and rotted wood on old oak stumps.

Coccinella 9-notata, Hbst. Abundant, most so early in the spring, when large quantities can be taken from under stones and other material lying in pastures. Varies in colour and markings.

Coccinella sanguinea, Linn. Not so abundant as *C. 9-notata*. Found in largest numbers in oat fields just before harvest.

Anatis 15-punctata, Oliv. Abundant, found feeding upon the leaves of various shrubs. Noticeable here from the fact it is seldom found in the interior of timber lands, preferring the vegetation along the borders, especially on the north side. Larvæ and pupæ always to be found if an adult can be.

Psyllobora 20-maculata, Say. I have three specimens in my cabinet, all being found under stones in a pasture, two taken in 1892 and one in 1893.

Chilocorus bivulnerus, Muls. The "twice stabbed lady bug" cannot be called common here. During five years I have not taken more than 25 specimens.

Hyperaspys undulata, Say. Occasionally taken, though it can hardly be classed as common.

Scymnus analis. I have three specimens in my cabinet which Dr. Riley identified as *analis*.

In conclusion, I wish to thank Dr. Riley for his valued assistance in naming the above species.

CORRESPONDENCE.

WINTER HABITS OF SOME COLORADO PROCTOTRYPIDÆ.

Sir,—In the review of Mr. Ashmead's work on the Proctotrypidæ in the last number of this paper, a method for obtaining some of the species in winter was mentioned. During a winter's collecting, mostly beneath stones, boards, etc., I have found the following species (determined by Mr. Ashmead) occurring quite frequently:—*Pantoclis montana*, Ashm., *Pantoclis coloradensis*, Ashm., *Tropidopria torquata*, Prov., *Tropidopria simulans*, Ashm., *Tropidopria*, sp., and *Aclista*, sp. In some localities the species first mentioned occurs quite abundantly.

CARL F. BAKER, Fort Collins, Colo.

CONCERNING CALOTARSA ORNATIPES, TOWNSEND.

Sir,—In the February number of the CAN. ENT., Prof. Townsend described and figured a peculiar fly under the above name. The figure of the hind tarsus at once reminded me of a fly I had collected some years ago at Ithaca, N. Y., and on comparing find that it is a specimen of *Calotarsa ornatipes*. But I had not considered the fly as a Syrphid, as its characters are opposed to almost everything of important value in the Syrphidæ. Not only in the absence of a spurious vein and the open first posterior cell, as mentioned by Prof. Townsend, but in the small basal cells, the presence of several prominent macrochætæ on the thorax, and the terminal *arista* to antenna. Some Syrphidæ have a terminal *style*, but an *arista* is different. Moreover, the origin of the anterior veins of the wings is unlike that of the Syrphidæ. Besides there are spurs at the tips of the intermediate tibiæ.

I am not a Dipterologist; but my specimen is labelled "Platypeza," which, I think, is correct. In this position the fly is not so anomalous and remarkable as when placed in the Syrphidæ. NATHAN BANKS.

Mailed March 13th.