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Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

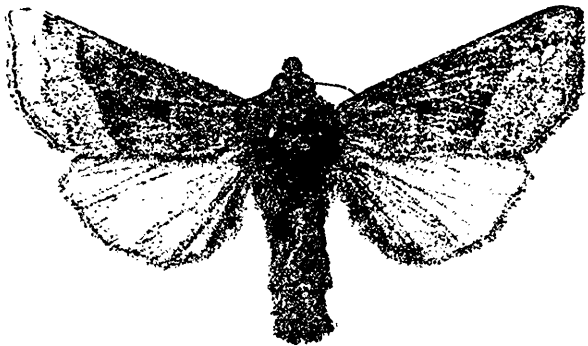


Fig. 5.

The Canadian Entomologist.

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No. 3

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HYDRÆCIA STRAMENTOSA, GUEN.

Plate 2, Fig. 5, nearly twice natural size.—I here copy in full the description of the species, as given by Dr. J. B. Smith in his recent revision of the genus *Hydræcia*, in the Transactions of the American Entomological Society, Vol. 26, May, 1899. Also his remarks on and about this interesting species.

"*Hydræcia Stramentosa*, Gn.—1852—Gn., Spec. Gen. Noct. 1, 129, pl. 6; F. 2. *Hydræcia*.

"Ground colour a rather dull luteous, with a dash of olivaceous. Collar with a narrow brown line above the middle, the tip distinctly smoky, as are also the tips of the thoracic tuftings. Edges of the patagiæ marked with smoky brown, which is particularly well marked at tip. Sometimes the entire thorax is darker, and in such cases the contrasts between the ground colour and the markings just described are not great. The abdominal tuftings at the base are also dark. The primaries have a reddish shade over the costal region extending to the tip. The outer portion of the median space is distinctly darker, olivaceous, and stands out quite evidently from the rest of the wing. The basal line is geminate, fairly well marked on the costa, then broken and only marked as a spot below that point. T. a. line geminate, the inner line scarcely traceable below the cell: as a whole it is nearly upright, but is inwardly curved through the cell and has a very feeble outcurve below that point. T. p. line very even, rather abruptly bent on the costa, a little outcurved over the reniform, and then evenly oblique inwardly to the inner margin. S. t. line irregular, brownish or smoky, marked by a preceding shade in

the costal region, and beyond that by dusky scales arranged quite regularly. There is an even line at the base of the fringes, which are dusky at tip and have a reddish shade toward the base. The median shade line is well marked on the costa and is blackish to the median vein. below that point it is olive-green and hardly darker than the shading of the outer part of the median space. In the costal region, between the outer part of the basal line and inner portion of the t. a. line, there is a blackish shading, and a similar, though much less marked, shading extends from the inception of the t. a. to the median shade line. The ordinary spots are well marked; the claviform is slightly soiled, olivaceous in colour. Orbicular almost upright, irregularly oval, of the ground colour or a little paler, outlined in olivaceous. Reniform upright, oblong, the angles pointed, hardly constricted in the centre. It is of the ground colour, or may have a slightly reddish tinge. Secondaries pale yellowish, without obvious markings. Beneath yellowish, both wings with a smoky outer line, which, in the specimens before me, does not extend across the wing. Expanse 1.68-1.72 in.; 42-43 mm.

"Hab.—Glenwood Springs, Colorado, September 10th, October 1st, foothills near Denver. 'Middle and Central States, New York, Illinois.'

"Three specimens have been under examination, and I have seen others. None of them, however, are from the East. There is a question, perhaps, whether this species is correctly identified. The examples before me agree with Guenée's figure and description, and I cannot remember having seen any species from the east which might be fitted to them. While I saw the type in the British Museum some years ago, my recollection does not serve sufficiently well to enable me to say whether or not this is really his species. I believe it to be so, and that probably in his original description, the locality, 'New York,' was an error. The other localities given in my Catalogue followed Mr. Grote's notes. I have never seen any specimens of *Stramentosa* identified by Mr. Grote. The specimens before me are all very much alike, and they are evidently related to *Immanis*."

The disclosure that *H. Stramentosa*, Gn., has been taken regularly at Montreal for years past by collectors connected with the Branch of the Ent. Soc. of Ont. there, is in great measure a re-discovery of the species in the East, apparently none knowing of its existence there except themselves. It appears in the early printed lists of our Society as an

Apamea, and I, being desirous of obtaining an example for the Society's collection, enquired of correspondents who I thought were likely to know, but none of them had ever seen it, or could give any information about it. There is an insect in the D'Urban collection which was made in Quebec, labeled *Hydræcia Stramentosa*, in Walker's handwriting, but it does not even belong to that genus. And when I read Dr. Smith's remarks, quoted above, I concluded that it had got into our list by mistake, and that it was not to be looked for in Canada. But one is always liable to find cause to change their conclusions.

Having received some material from Montreal for names, there was amongst it a fresh, bright orange-yellow specimen of *Hydræcia* with purple bands, which so closely resembled the *purpurifascia* in our drawers, that, without giving it critical examination, I placed that name opposite its number. When the specimens were returned, Mr. Brainerd objected to that name; not that he claimed to be able to distinguish the species, but he thought there was not enough of the food-plant of *purpurifascia* about Montreal to feed a tithe of the moths that could be taken there, remarking that they had been calling it *rutila*, and suspected that I must be wrong. Being so different in colour from all the *rutilas* I had seen, I hesitated to accept it as such; so obtaining another specimen, I referred it to Dr. Smith, who pronounced it to be "a very typical specimen of that species." When I informed Mr. Brainerd of the decision being in his favour, I requested from him another specimen if he could spare it, which he kindly sent, and said, "With it I put one of what we call *Stramentosa*, which is the only other common species here except *Nictitans*," which proved to be the true *H. Stramentosa*, Guenée, and thus, by a fortunate error on my part, has its presence there been disclosed to the rest of the Entomological world.

When I informed Dr. Smith of the discovery, he replied: "I am delighted to hear of its occurrence there, and it may be now that it will turn up in the northern or mountainous districts of New York or New England. I must say I hesitated long before I dared to identify Guenée's description as I did, with no sort of proof that the species occurred this side of the Rockies."

Mr. Brainerd intends to make a vigorous effort to discover its food plant next season, and so obtain the larva for description.

DESCRIPTION OF PLATE.

The photos for the plate were taken by Mr. Dwight Brainerd, Montreal.

Figs. 1 and 2 are a natural pair of *H. rutila*.

Fig. 3 is a pupa of *H. nitela*.

Fig. 4 is a gall of same, showing the opening made by the larva.

Fig. 5, *H. Stramentosa*.

All enlarged.

CONTRIBUTIONS TO COCCIDIOLOGY.—II.

BY J. D. TINSLEY, A. AND M. COLLEGE, MESILLA PARK, N. M.

During the past summer I have had the opportunity, through the kindness of Dr. Howard, of working over the unnamed material of the genera *Dactylopius*, *Ripersia*, and *Phenacoccus*, belonging to the collection of the Division of Entomology, U. S., D. A. I wish to record here the identity of *D. vastator*, Mask., with *D. filamentosus*, Ckll., and two species which I believe to be new. I hope in a subsequent paper to give further notes on some of the other species found, and also to record the new host plants found for a number of species.

Dactylopius filamentosus, Ckll., syn. *Dactylopius vastator*, Maskell.—I have before me a considerable quantity of material, specimens as follows: Type material of *D. filamentosus*, Ckll.; material from Island of Mauritius on Citrus sent by De Charmoy; and the following from U. S. D. A., Div. Ent.: 7232 on *Hibiscus*, Richmond, Natal; 7706 on Orange, Cape Town, Africa (Coll., Lounsbury); 5820 on Tamarind and Citrus, Honolulu, Sandwich Is. (Coll. Koebele). After carefully examining and comparing individuals from each lot of material, I can find no characteristic differences, and must therefore conclude that they are all one species. Since Cockerell described *filamentosus* in 1893 (The Entomologist, Vol. XXVI., p. 268, Sept., 1893), and Maskell described *vastator* in Trans. N. Z. Inst., 1894, p. 65, *D. vastator*, Mask., will have to stand as a synonym of *D. filamentosus*, Ckll.

The No. 5820 material is of considerable interest, it being topo-type, and is that referred to by Maskell, *loc. cit.* The most prominent characters of this species are: the habit of aggregating into masses; the abundant white or yellowish secretions; and when boiled in potash staining the liquid a dark purple to blue-green and themselves turning blue-green; they are very hard to clear; the antennæ are of 7 segments:

segment 1, 37-45 μ long; segment 2, 37-39 μ long; segment 3, 28-40 μ long; segment 4, 28-34 μ long; segment 5, 22-31 μ long; segment 6, 22-34 μ long; segment 7, 73-84 μ long; legs, femur about 140 μ long; tibia, about 100 μ long; tarsus, about 70 μ long; derm bearing peculiar spear-shaped spines. This species does not resemble *D. Townsendi*, Ckll., as supposed by Maskell. It resembles *albizzia*, Mask., and *hymenoclea*, Ckll., in producing the blue-green pigment in potash, but is distinct from them in the secretion and anatomical characters.

Dactylopius Texensis, n. sp.

Specimens have been in alcohol since Dec., 1895. Adult ♀; length about 3 mm.; nearly as wide as long; shape rather sub-globular; colour light brown. I know nothing at present of the secretion. Epidermis bearing scattered, medium-sized hairs and numerous small glands; margins of body with areas of glands and stout conical spines. Antennæ of eight segments: segment 1 rather large, 53-59 μ long; segment 2 rather wide, tapering slightly toward the proximal end, length 48-51 μ ; segment 3 about three-fourths the width of 2, cylindrical, 52-62 μ long (the length of this segment may be either less than, equal to or greater than that of 1, they are often nearly sub-equal); segment 4 quite short, 20-28 μ long; segment 5, 28-37 μ long; segment 6, 25-31 μ long; segment 7, 31-39 μ long; segment 8 usually about 84 μ long. Among observed formulæ are: S_3I_2 (57) (46), S_3I_27564 , $8I_327$ (56) 4. The segments bear one or more whorls of medium-sized hairs.

Legs rather short and stout; femur about 182 μ long by 82 μ wide, bearing numerous medium-sized hairs; tibia, 132 μ long by 35 μ wide, bearing several rows of small hairs; tarsus 65 μ long; tarsal digitules long, slender, knobbed hairs; claw stout, 31 μ long; digitules of claw long, slender, knobbed. Mentum elongate. Anal lobes not conspicuous, bearing the usual long spine, and areas of cones, hairs and spinnerets. Since the specimens are alcoholic, we know nothing of the ovisac. Eggs unknown. Male unknown.

Hab.—On *Acacia Farnesiana*, Willd.; San Diego, Texas, Dec., 1895. U. S. D. A., Div. Ent., No. 6961.

Remarks.—This species resembles *D. Ryani* in antennal formula, but differs in having the antennæ smaller and the legs shorter and stouter. Resembles *D. dasylirii* in the general form of the antennæ, but differs in having segments 3 and 1 of antennæ usually longer than 2, and differs very much in the shape of the body.

Dactylopius Farnesianæ, Targ., found on *Acacia Farnesiana* at Vicenza, Italy, seems to be quite a different insect. I also have before me a *Dactylopius*, in alcohol, on sugar cane from Mauritius, U. S. D. A., Div. Ent., No. 6596, sent the Dept. by Miss Ormerod; these specimens I take to be the ones mentioned by Maskell in *Trans. N. Z. Inst.*, 1896, p. 321; see also *Insect Life*, Vol. VII., p. 430. This *Dactylopius* differs in no material points from the *Texensis*. The general appearance of the alcoholic specimens is the same, the measurements of the segments of the antennæ come within the limits given for *Texensis*; the femur is same length as in the above; tibia is a little longer, one being 160 μ ; tarsus is also a little longer, 90 μ ; claw is more slender. I do not consider these differences sufficient for separating them, but it may be that when complete specimens of each are obtained there may be differences in colour, ovisac, etc., which may separate them. It seems strange that a species should be found in such widely-separated localities, and especially upon such different host plants.

Ripersia serrata, n. sp.

Adult ♀. Length, including fringe, about 2 mm.; width nearly 2 mm. Shape broadly elliptical. Colour of dried specimens blackish. There are three rows of beaded secretion on the dorsum: two lateral and a median, with the dark body showing up more or less between them, the median is most prominent. On the margin of the body is a fringe of projections; these consist of pairs of rods which become somewhat shortened and dentate toward the anterior extremity, while those of the posterior extremity of the body are longer and more distinctly rodlike; their length is usually less than half the width of the body. The general appearance of this insect, with its secretion, suggests that of *Dactylopius pseudonipæ*, and species of *Orthezia*.

Margin of epidermis bearing areas of several stout conical spines and numerous glands; numerous small glands scattered over the epidermis, and also a few scattered hairs.

Antennæ rather slender, of six segments, the relative lengths rather variable; first segment 20-25 μ long, second 22-28 μ , third 28-34 μ , fourth 17-20 μ , fifth 20-25 μ , sixth 48-56 μ . Some observed formulæ are: 632514, 632154, 63(125)4, 63(25)14, 63(12)54. The segments bear whorls of medium-sized hairs.

Legs rather slender for a *Ripersia*; femur 85-100 μ long by 35 μ wide; tibia about 70 μ long; tarsus about 47 μ long; claw rather stout;

tarsal digitules rather stout, knobbed: digitules of claw longer than the claw and knobbed. Hairs on legs rather small and scanty.

Anal lobes rather prominent, bearing a large seta 75μ long, and a number of quite stout conical spines and spinnerets. Anal ring normal. Female ovisac unknown.

Eggs and larvæ unknown. Male unknown; male sac white, elongate, about 2 mm. long and 75 μ wide.

Habitat.—On a creeping vine. Collected by H. Caracciolo, Port of Spain, Trinidad, W. I.; Jan. 27, 1894.

Rem.—This is No. 6160 of the U. S. D. A. collection. The most marked characteristic of this species is the peculiar arrangement of the secretion described above. It seems to resemble *R. filicicola*, Newst.

A NEW SPECIES OF SINEA.

BY A. N. CAUDELL, DEPT. OF AGRICULTURE, WASHINGTON, D. C.

Sinea complexa, n. sp.—Length, ♂, 8 to 9.5 mm., ♀, 9.5 to 11 mm.; width, ♂, 3 mm., ♀, 3.5 to 4.5 mm. General colour ranging from a very dark brown to pale cinnamon. Head armed with three pairs of antecular spines, the posterior pair the longest, with smaller ones interspersed. Behind the eyes, with several sharp spines, one near each ocellus being almost as long as those of the posterior antecular pair. Neck spinose. Antennæ somewhat pallid, with a slight rufous cast at the distal ends of the segments.

The anterior femora are much swollen and armed with the usual long, sharp, dorsal-spine, and with ten spines beneath arranged in two longitudinal rows. The last two spines of the inner row are much larger and longer than the others, and the terminal one is out of alignment, so that it is rather on the dorso-lateral surface. (*Sanguisuga* and some other species also show this arrangement of spines on the anterior femora, but in these cases there is no striking enlargement of the spines, and hence it is not so noticeable. The nymphs of *diadema*, and probably other species as well, have dorso-lateral spines on the anterior femora.) This spine is almost as long as the dorsal one and, when the femora is viewed from the front, is quite prominent. In this view the second spine also is somewhat prominent. The anterior tibiæ have the usual double row of three strong spines below. They are pale towards the tip, with the apex black. The dorsal and two enlarged ventral spines of the anterior

femora also have the tips black. The hind and middle legs are without distinguishing characters.

Thorax with distinct, sharp spines on both lobes, those of the anterior lobe the longest. Breast spined, usually with blunt spines. Disk of the posterior thoracic lobe convex, hardly impressed longitudinally. Lateral angles quite acute, moderately prominent. Scutellum black, triangular, with raised centre and slightly turned up at the tip. Abdomen of both sexes wider than the hemelytra, considerably so in the females, where the margins are somewhat elevated and the sides rounded. Quite uniformly coloured, sometimes paler on the posterior borders of the segments near the lateral margins.

Described from specimens in the National Museum, from Los Angeles, California; collected by Mr. Coquillett. They were given the manuscript name *complexa* by Prof. Uhler. This name, with the kind consent of the author, I gladly adopt. Type No. 4433, U. S. Nat. Mus.

This species belongs to the *sanguisuga* group, characterized by a short, broad form, as opposed to the longer forms represented by *diadema*, *undulata* and *coronata*. It is quite a well-marked species, the distinctly spined posterior thoracic lobe, together with the peculiar armature of the anterior femora, readily separating it from its allies.

A NEW POPULAR NAME FOR CLISIOCAMPA DISSTRIA.

In the January number, Prof. Slingerland proposes a new common name for the "forest tent-caterpillar," and proposes "forest tentless-caterpillar." The objection would be, that "tent-caterpillar" is an English equivalent for *Clisiocampa*, and need not be altered whether the particular species makes a tent or not. What is needed in names is fixity, not relevancy. Another objection is, that *tentless* is not the antithesis to *tent*, but to *tented*. There is, on a previous page of the same number, a protest against changes in Latin terms in entomology, and also systems of classification. Whatever force lies in this protest is doubled when English names, which have no classificatory significance, are to be considered. I should therefore be in favour of retaining the names, "apple tent-caterpillar" and "forest tent-caterpillar," for the two species of *Clisiocampa*, now known under these common titles. If inapplicability were a valid reason for changing names in entomology, we should be quite lost. And the new name, "forest tentless-caterpillar," besides implying that the insect is not a *Clisiocampa*, ceases to be distinctive, for there are other caterpillars of the forest which are unprovided with tents.

A. RADCLIFFE GROTE, Hildesheim, Germany.

NYMPHS OF NORTHERN ODONATA, STILL UNKNOWN.

BY JAMES G. NEEDHAM, LAKE FOREST, ILL.

This is a word in season to collectors of aquatic insects, who may be afield during the months of spring and early summer.

Among the nymphs of Odonata occurring in the North-eastern States and Canada, there remain a number of good discoveries to be made. In any locality where these nymphs are common their discovery will not be a difficult matter. Nymphs of the following half-dozen species are pre-eminently desirable :

1. *Tachopteryx Thoreyi*, Sel. Atlantic States. No nymphs of its sub-family known.
2. *Gomphaeschna furcillata*, Say. Eastern States.
3. *Nannothemis bella*, Uhl. Atlantic Seaboard.
4. *Neurocordulia obsoleta*, Say. Eastern States.
5. ? *Neurocordulia Uhleri*, Sel. Me. Mass., N. J.
6. *Somatochlora Lintneri*, Hag. N. Y., Saskatchewan.

} No nymphs of these
} genera known.

The last-named genus, which is peculiarly a northern one in our fauna, is large and polymorphic. Even the imagoes are very insufficiently known, and few nymphs of fewer species have been taken, though they must be very common in proper localities. Canadian collectors have every advantage in the study of this genus.

While a large number of nymphs of Odonata have been collected and reared of late, descriptions of them have not, unfortunately, as yet got into print. The species above mentioned are among the most desirable of those which have not, I believe, as yet been found. I have had no difficulty in rearing all the genera and almost all the species occurring in the localities in which I have lived during the last five years : but these six have not come my way. I should be glad to help any one who wishes to undertake to find and rear these nymphs, by sending a printed account of the methods I have used successfully, and by the determination of dragon-fly material in all stages of development.

A STUDY OF HYDROMETRA LINEATA.

BY J. O. MARTIN, CORNELL UNIVERSITY, ITHACA, N. Y.

Among the reeds and rushes that border quiet streams and ponds lives *Hydrometra lineata*, one of the least known of our North American Hemiptera. This insect is comparatively rare in collections, but common enough in nature, though owing to its small size and inconspicuous appearance it escapes all but the sharpest-eyed collectors. Its elongate body is borne on hairlike legs and resembles a bit of twig or grass more than a living insect. After the eye becomes accustomed to the odd shape, they are most easily distinguished, especially when they move about over the surface of the water. During the past summer I took over five hundred specimens of this insect without any special effort, finding them common through New York State, Massachusetts, and Connecticut.

The appearance of this insect is unique and exceedingly grotesque, for the head, thorax and abdomen are so elongate and the legs so thin that it produces the effect of a minute Indian club stalking about on the water. Closer examination reveals a pair of solemn, protruding eyes situated at about the middle and on either side of the handle of this Indian club, while from the end a pair of threadlike antennæ are waved about in a mysteriously cautious manner. Underneath the head is the murderous beak, the common possession of all hemipterous insects. In very rare cases individuals may be found with a pair of wings closely folded upon the back and covered with leathery hemelytra, which are only to be detected by the use of a lens.

The economy of this elongate form becomes at once apparent on studying the habits of *Hydrometra*. In the first place, it reduces the insect's weight to the minimum and lessens the liability of breaking through the treacherous surface film upon which the life of this aquatic pedestrian is passed. In the second place, the long, cylindrical body is so like a bit of twig in appearance that *Hydrometra* is protected from his enemies and concealed from his prey, which do not in the least suspect in this apparent straw the presence of a deadly foe.

The genus *Hydrometra* was first established by Latreille in his "Precis des Caractères Generiques des Insects" (1797) p. 86. I have not had access to this book, but in his "Histoire Naturelle des Crustaces et Insects," T. xi., pp. 267-269 (1804), Latreille says: "I have taken the characters of the insect pointed out by Geoffery, *Cimex stagnorum*

(Linn.). My genus *Hydrometra* is easily distinguishable from *Gerris* in the following characters: Head drawn out into a long, cylindrical snout, recurvant and in a longitudinal groove the beak. These insects have the body very narrow, slender and linear, the head very long and slender, carrying at the extremity of the elongate snout two setaceous four-jointed antennæ. The eyes are large and globular and are situated near the middle of the snout; Linnaeus mistook them for tubercles. The thorax is long and cylindrical, the tegmina are very short and narrow and lie on the back, not occupying more than the interval between the second and third pairs of legs. The abdomen is very long and slightly larger than the anterior portion of the body; it is cylindrical and has two longitudinal keels, one on each side of the border. The legs are very thin and long, the middle pair being nearer the anterior pair than to the posterior. *Hydrometra* loves aquatic places, and runs with some agility on the surface of the water, but not very rapidly. It is this habit that gives them their name *Hydrometra* (water measurer)." When Latreille first established this genus it contained but two species, one from Europe, *H. stagnorum*, and another from the West Indies, the first serving as the type.

Cimex stagnorum (Linn.), Latreille's type, was placed by Linnaeus, who described it, in his heterogeneous genus *Cimex*, which included many widely different Hemiptera. Later naturalists in dividing up this genus placed *H. stagnorum* in various genera, such as *Gerris* and *Emesa*, until it was rescued by Latreille and placed in a genus by itself, which its unique characters well merited. Later, Burmeister,* setting aside Latreille's work, proposed the generic name *Limnobates* for this insect, and this name is frequently to be met with in comparatively recent books.

The United States, like Europe, has up to the present but a single species, and this (*H. lineata*) was first described by Thomas Say.† I quote the following: "*H. lineata*. Fuscous; hemelytra dull whitish with black nervures. Inhabits United States. Body fuscous or brown, more or less deep; hemelytra dull whitish or dusky, with black nervures; tergum pale, quadrilineate with black; two of the lines on the edge and the interval between the two inner lines, dull whitish or bright yellow; the incisures of the segments more or less black; beneath and feet obscure

* "Handbuch der Entomologie" (1839), Vol. II., No. 1, p. 210.

† The complete writings of Thomas Say on the Entomology of North America (Leconte's Edition), Vol. I., p. 361.

yellowish; thorax with a more or less obvious pale line. Length, seven-twentieths of an inch. This is very much like the *stagnorum*, F., but the hemelytra are not testaceous and there is no thoracic impressed line.

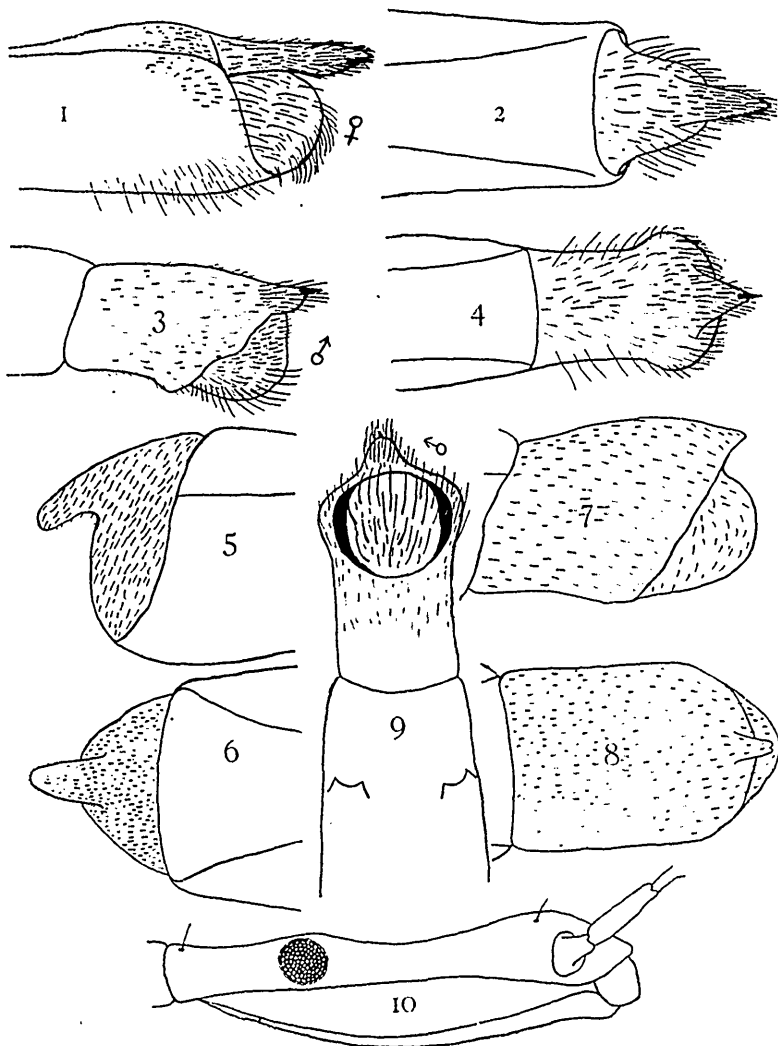
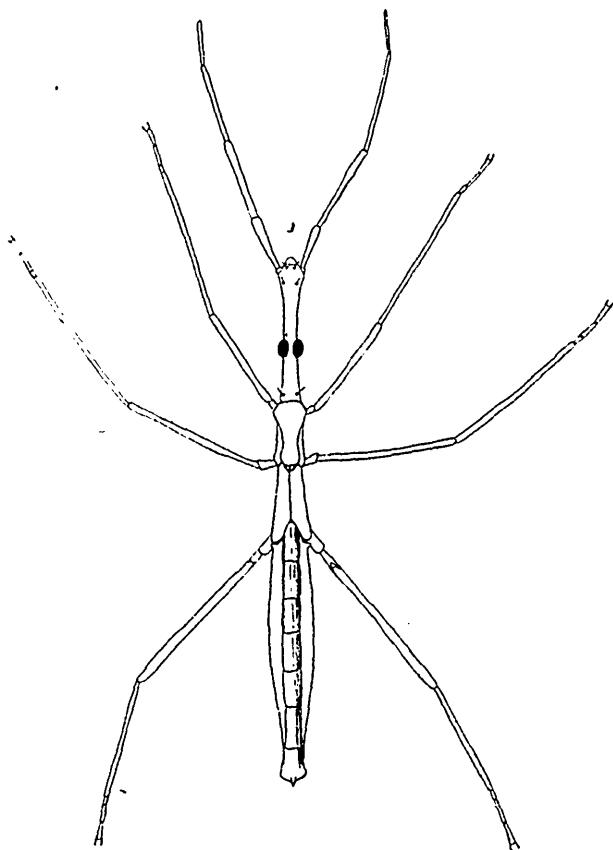


PLATE III.—Structural details of *Hydrumetra lineata*.

FIG. 7.—*Hydrometra lineata*. Male.

EXPLANATION OF PLATE III.

- Fig. 1.—Lateral view of genitalia of *H. lineata*, female.
 " 2.—Dorsal " " " " female.
 " 3.—Lateral " " " " male.
 " 4.—Dorsal " " " " male.
 " 9.—Ventral " " " " male.
 " 5.—Lateral " " *H. stagnorum*, female.
 " 6.—Dorsal " " " " female.
 " 7.—Lateral " " " " male.
 " 8.—Dorsal " " " " male.
 " 10.—Lateral view of head of *H. lineata*.

[Male?] Body blue-black; thorax with a pale line; antennæ and feet dark honey yellow; tergum and venter without lines."

"Var. a. *Australis*. Head beyond the eyes a little longer and a little more dilated at tip; second joint of the antennæ a little more dilated at tip; abdomen with five lateral whitish points. Inhabits New Orleans."

It will be noted in the above description that Say could find no very specific difference between *H. lineata* and *H. stagnorum*; by looking carefully at the genitalia of each, however, it is seen that there is a wide difference between them. It is in these fundamental structures that we find the variations which are best adapted for separating the species referred to in the above. Just what these differences are may best be seen by reference to Plate III., where Figs. 1 and 2 show lateral and dorsal views of the genitalia of the female *H. lineata*, and Figs. 3 and 4 show lateral and dorsal views of the male genitalia of the same species; Figs. 5 and 6 are the genitalia lateral and dorsal of female *H. stagnorum*; Figs. 7 and 8 are the same for the male of this latter species. The male is darker in colour than the female, and much smaller, the average length of twenty males being 8.8 mm., while twenty females averaged 9.7 mm. in length.

The peculiar habitat of *Hydrometra*, combined with its elongate form, has given rise to a secondary sexual character, which occurs in both *H. lineata* and *H. stagnorum*. This consists of two notched projections on the inner side of the sixth abdominal segment, close to the incisure between the sixth and seventh segments. The object of these notched elevations of the abdominal walls is to fit over the lateral keels of the female abdomen, thus steadying the abdomen of the male during copulation. This is rendered necessary not only by the elongate abdomen, but also by the fact that it is necessary for the insects to maintain their balance upon the water or run the risk of breaking through the treacherous surface film, an accident very likely to cause death. The abdomen in both sexes is stiffened and made rigid by a concentration of the segments along the venter, and by two keel-like lateral expansions of the abdominal segments. Along these keels the segments have become so firmly cemented that the joints between the segments do not show, thus giving to the keels the appearance of continuous structure.

The life-history of *H. lineata* is similar to that of other Hemiptera in that there are several broods during the summer. The insect hibernates in the adult stage, and during the first warm days of spring crawls stiffly out from under the rubbish along the banks, where it has passed the winter. When the weather becomes warm enough (the first to tenth of May at Ithaca), egg-laying begins; the female becomes restless and stalks about in search of a place to deposit an egg. The laying of an egg by this stiff-abdomened, clumsy creature is accomplished in a very peculiar manner: Backing up to a grass stem or almost any firm object which

rises above the water, she exudes from the genital opening a drop of a gummy gelatinous substance, which she then presses against the object that has been chosen to support the egg. This sticky mass is the base of the egg-stalk, and hardening very soon, fastens the egg in place before it has left the body. The insect now walks away from the stalk, thus freeing

herself from the egg. This egg, as may be seen from the drawing (Fig. 8), is long and spindle-shaped, with the micropile on the extreme end away from the point of attachment. The length of the egg is about two millimetres, a little more than one-fifth the total length of the insect apart from the antennae, and about one-half the length of the abdomen. I was unable to determine how many eggs each female lays, for *Hydrometra* is not an easy insect to raise in confinement, being easily drowned in aquaria, and then the eggs are very hard to find where there is anything like an approach to natural conditions. The number cannot be very great, however, for the size of the egg is such that the abdomen could hardly contain more than four or five at the most. Each egg is attached to its support at right angles to the surface, but is frequently found hanging down as the result of some accident.

The interior egg sac is protected by a horny exterior coating decorated with longitudinal ribs or flutings, the surfaces of which are granulated and marked by a rather indistinct hexagonal pattern; in the drawing this pattern has been exaggerated in order to call attention to its existence, for it is not at first apparent, and indeed does not appear to be present in some cases. Around the micropile end this protective coating takes the form of a series of plates, while around the stalk it extends in an enclosing sheath of a delicate tracery of network, through which can be seen the darker coloured supporting stalk. Mounted in Canada balsam this covering becomes more or less transparent, showing the oval pod-shape of the egg proper, with its slender stalk on one end and the micropile on the other.



FIG. 8.—Egg of
Hydrometra.

Out of this egg there emerges, seventeen days after laying, the soft-bodied, light green nymph which has, as do all Hemiptera, the general characters of the adult. The nymph in this case

differs, however, from the adult in having the tarsi one-, instead of three-jointed. The body is so soft at birth and during the five moults which follow that the nymphs are frequently drowned, not being able to raise their bodies above the surface film so easily as do the more rigid adults.

During the summer there are varying numbers of broods, depending largely upon the length and temperature of the season, for this simple life-history is repeated as fast as the insects reach maturity.

Hydrometra is a carnivorous insect, its food consisting of the juices of insects that fall into the water, and the number of these is considerable along the grassy aquatic borders. When such a hapless insect falls into the water it is at once pounced upon by one or several voracious Hydrometras, who insert their beaks and proceed to suck the juices from their still struggling victim. I have seen no less than ten thus surround their prey, all with their heads in the direction of common interest and their bodies radiating outward. The body and legs of Hydrometra are covered with minute hairs, which prevent the body from being easily wet. The insect is constantly engaged in lifting its legs into the air to dry them, for if they once become wet they sink through the surface film just as would a floating needle. When Hydrometra does break through the surface film he is often able to free one leg after another, and then by main force raise his body up also.

In Lethierry and Severin's Catalogue of the Hemiptera there are listed eleven species of Hydrometra, but this list is not complete, for it does not contain *H. lineata*. These eleven species are mostly tropical and sub tropical, with the exception of the European species and one from Siberia. One species from the Philippines may eventually become a member of the fauna of the United States, though at present *H. lineata* is our sole representative of this genus. It seems that subsequent study will show more species within the boundaries of the United States, and that Say's variety *australis* will be found to be a distinct species.

ORCHELIMUM, SERV.

BY JEROME M'NEILL, STANFORD UNIVERSITY, CALIFORNIA.

This genus of Orthoptera is confined almost entirely to North America, where it is represented by twenty or more species. Joseph Redtenbocher in his "Monographie der Conocephaliden," published in 1891, united *Orchelimum*, Serv., to *Xiphidium*, Serv. This action seems scarcely justified, as the two groups are quite as distinct as many other Orthopteran genera, and Redtenbocher's authority has not been generally recognized in this country. The species are distinguished with difficulty and the descriptions are widely scattered. These considerations have led me to attempt to make a key for their identification. It is quite possible that some of the species indicated are synonymous, but I am inclined to believe that all I have recognized are good, and I believe there are a considerable number undescribed. Many forms which differ from each other by very few structural differences are distinguished by some peculiarity of song or habit or habitat, and it is certain that a considerable number of them have been overlooked.

KEY TO ORCHELIMUM.

- A. Hind femora not armed with small spines on the under side.
- b¹. Ovipositor straight or very slightly curved; face not striped medianly, pale.
- c¹. Tegmina surpassing the tips of the femora more or less.
Length of the ovipositor 10 mm. or more, little if any less than two-thirds the length of the hind femora.
- d¹. Pronotum short, less than one-fourth the length of the body and not more than 4 mm. long; tegmina only slightly surpassing the tips of the hind femora; a broad reddish-brown band upon the head and pronotum, somewhat paler in the middle. . . . *Delicatum*, Bruner.
- d². Pronotum longer, more than one-fourth the length of the body and more than 4 mm. long; tegmina little if any shorter than the wings and reaching almost to the tip of the ovipositor; two well-defined narrow dark brown diverging lines upon the pronotum *Gladiator*, Bruner.
- c². Tegmina not reaching the tips of the hind femora; ovipositor brown, much less than 10 mm. long. *Minor*, Bruner.

b³. Ovipositor decidedly curved.

c¹. Size small, less than 14 mm.; tegmina without the two black lines usually present on either side of the speculum..... *Gracile*, Harr.

c². Size medium or large, at least 16 mm. long.

d¹. Face pale or unicolorous, never with reddish-brown or fuscous stripe down the middle.

e¹. Hind femora short, less than five-sixths the length of the body and not exceeding 15 mm. in length.

f¹. Tegmina not much exceeding the hind femora; ovipositor less than 9 mm. long; posterior margin of the lateral lobes strongly sinuate; anterior and middle tibiae green or yellowish..... *Vulgare*, Harr.

f². Tegmina far surpassing the tips of the hind femora; ovipositor more than 10 mm. long; posterior margin of the lateral lobes of the pronotum distinctly but not strongly sinuate; anterior and middle tibiae fuscous black..... *Robustum*, Red.

e². Hind femora longer, at least five-sixths as long as the body and not less than 17 mm. in length; ovipositor less than half as long as the hind femora.

f¹. Pronotum longer, more than one-fourth as long as the body; tegmina not far surpassing the tip of the hind femora.

g¹. Tegmina not narrowed in the middle; anal cerci of the male slender, the basal tooth short and weak; tegmina and wings olivaceous brown; size less than medium..... *Campestre*, Blatchley.

g². Tegmina narrowed in the middle; anal cerci of the male swollen, armed within with a strong basal tooth; posterior margin of the lateral lobes of the pronotum strongly sinuate; size greater than medium..... *Glaberrimum*, Burm.

- f². Pronotum short, less than one-fourth as long as the body; tegmina far surpassing the tip of the hind femora and distinctly shorter than the wings. *Longipenne*, Scudd.
- d². Face with a reddish-brown stripe down the middle; pronotum short, less than one-fourth the length of the body; ovipositor less than one-half the length of the hind femora; body slender.
- e¹. Stripe broadly expanded on the lower half of the face, forming a triangular spot; tegmina brownish-green or testaceous. *Concinnum*, Scudd.
- e². Stripe not expanding on the lower part of the face; tegmina and wings transparent whitish tinged with green on the principal veins of the lateral field. *Indianense*, Blatchley
- A². Hind femora armed with one or more small spines on the under side.
- a¹. Tegmina not much longer than the body, generally plainly shorter; ovipositor decidedly curved and never more than 9 mm. long.
- b¹. Face pale, without a narrow median stripe.
- c¹. Tips of the hind femora surpassed by the tegmina.
- d¹. Dorsal stripe present; ovipositor exceeding half the length of the hind femora; pronotum more than one-fourth the length of the body. *Sylvaticum*, McNeill.
- d². Dorsal stripe absent; ovipositor less than half the length of the hind femora; pronotum less than one-fourth the length of the body. *Spinulosum*, Red.
- c². Tips of the hind femora not reached by the tegmina, which are decidedly shorter than the body; pronotum considerably more than one-fourth the length of the body. *Cuticulare*, Serv.
- b². Face with a narrow median stripe *Agile*, DeGeer.
- a². Tegmina considerably longer than the body.
- b¹. Ovipositor not more than 9 mm. long and decidedly curved.
- c¹. All the tibiæ black or infuscated on the upper side; ovipositor plainly more than half the hind femora;

pronotum not less than one-fourth the length of the body; dorsal stripe present, though frequently obsolete posteriorly *Nigrripes*, Scudd.

c². All the tibiæ not black nor infuscated on the upper side; ovipositor distinctly less than half the length of the hind femora; pronotum less than one-fourth the length of the body; dorsal stripe wanting *Nitidum*, Red.

b². Ovipositor at least 10 mm. long.

c¹. Hind femora spined only on the outer carina of the under side; ovipositor nearly straight.

d¹. Tegmina not more than 25 mm. even in the female, much less in the male; general colour brownish-green; dorsal stripe bordered by two narrow lines of darker brown . . . *Bruneri*, Blatchley.

d². Tegmina not less than 25 mm. long even in the male, much more in the female; tegmina strongly reticulate; the anal area forming a distinct angle with the lateral field *Volantum*, McNeill.

c². Hind femora spined on both carinæ of the under side; ovipositor distinctly curved; dorsum of the pronotum with two reddish-purple stripes; pronotum less than one-fourth the length of the body . . . *Laticauda*, Red.

ORCHELIMUM DELICATUM, Bruner.

Orchelimum delicatum, Bruner. Ent. News, III., 264, Dec., 1892.

“ *gracile*, Bruner. CAN. ENT., XXIII., 70.

Not “ “ Harr.

This species was re-named by Bruner when he found it necessary to restore Harris's *O. gracile*, which on the authority of Scudder had been considered a synonym of *Xiphidium fasciatum*, De Geer.

It is very limited in distribution, being known only from Nebraska, where, however, Bruner says it is “quite common in the vicinity of West Point, about the margins of ponds, etc.” He also took it at the electric light in Lincoln.

ORCHELIMUM GLADIATOR, Bruner.

Orchelimum gladiator, Brun., CAN. ENT., XXIII., 71.

" " Blatchley, Proc. Ind. Acad. Sci., 1893.*

Nebraska, "On the flowers of a prairie golden-rod (*Solidago rigida*, L.), at West Point," Bruner; Indiana, "From the borders of a tamarack swamp," Blatchley.

ORCHELIMUM MINOR, Bruner.

Orchelimum minor, Bruner, CAN. ENT., XXIII., 72, Apr., 1891.

Apparently a rare species, known only from the District of Columbia. It is unknown to me and has not been recognized since it was named.

ORCHELIMUM VULGARE, Harr.

Orchelimum vulgare, Harr., Ins. Inj. to Veg., p. 162, fig. 77, 1862.

" " Scudd., Mat. for Mon., 452, 1862.

Xiphidium agile, Red., Mon. der Con., 186, fig. 80, 1891.

It is very probable that many of the references to this insect are mistaken. It seems to range over the northern United States from the Pacific to the Atlantic, and northward for an unknown distance into British America. It is found as far south as Arkansas and Maryland.

ORCHELIMUM GRACILE, Harr.

Orchelimum gracile, Harr., Ins. Inj. to Veg., 1862, p. 163, fig. 78.

" " Brun., Ent. News, III., Dec. 1892, 264.

Not *Xiphidium fasciatum*, Scudd., Mat. for a Mon., 1862, 451.

According to Bruner, Scudder was mistaken in referring *O. gracile* to *X. fasciatum*. Massachusetts, Harris; New Jersey, Bruner.

ORCHELIMUM ROBUSTUM, Red.

Xiphidium robustum, Red., Mon. Con., 185, 1891 New Orleans, Redtenbocher.

ORCHELIMUM CAMPESTRE, Blatchley.

Orchelimum campestre, Blatch., Proc. Ind. Acad. Sci., 133, 1893.

Reported from Vigo and Fulton Counties, "In upland prairie meadows, where it frequents the tall grasses, usually in company with *Xiphidium strictum*, Scudd."

ORCHELIMUM GLABERRIMUM, Burm.

Xiphidium glaberrimum, Burm., Hand., II., 3, 707, 1839.

*The title page of the author's reprint bears the date 1892, but it is evident that this paper was not printed until 1893 or later, as some of the synonymy given bears the date 1893. (See page 135.)

Orchelimum glaberrimum, Scudd., Mater. for a Mon., 453, 1862.

Xiphidium " Red., Mon. der Con., 187, 1891.

The whole United States east of the Rocky Mountains.

ORCHELIMUM LONGIPENNE, Scudd.

Orchelimum longipenne, Scudd., Mat. for a Mon., 453, 1862.

Xiphidium inerme, Red., Mon. der Con., 187, 1891.

Texas, Redtenbocher, Scudder; Kansas, Nebraska, Bruner.

ORCHELIMUM CONCINNUM, Scudd.

Orchelimum concinnum, Scudd., Mat. for a Mon., 452, 1862.

? " *herbaceum*, Serv., Hist. Nat. Orth., 524, 1839.

Xiphidium concinnum, Red., Mon. der Con., 188, 1891.

Blatchley says: "It frequents the weedy and grassy margins of marshes and lowland ponds and reaches maturity about August 15th." Massachusetts, Scudder, Redtenbocher; New York, Beutenmüller; Indiana, Blatchley; Illinois, McNeill; Nebraska, Bruner.

ORCHELIMUM INDIANENSE, Blatch.

Orchelimum Indianense, Blatch., Proc. Ind. Acad. Sci., 137, 1893.

Blatchley says it was "quite common among the rank grasses and sedges about the margins of a tamarack swamp near Kewana, Fulton County, Indiana.

ORCHELIMUM SYLVATICUM, McNeill.

Orchelimum sylvaticum, McNeill, Psyche, 26 Feb., 1891.

" " Blatch., Proc. Ind. Acad. Sci., 136, 1893.

Found on corn and about open places in the woods. Blatchley says: "It frequents the borders of cultivated fields and open woods. Illinois, McNeill; Indiana, Blatchley.

ORCHELIMUM SPINULORUM, Red.

Xiphidium spinulorum, Red., Mon. der Con., 189, 1891. North Carolina, Redtenbocher.

ORCHELIMUM CUTICULARE, Serv.

Orchelimum cuticulare, Serv., Hist. Nat. Orthop., 523, 1839.

Xiphidium cuticulare, Red., Mon. der Con., 189, 1891. Texas, Redtenbocher.

ORCHELIMUM AGILE, De Geer.

Locusta agilis, De Geer., Mem., III., 457. Pl. 40, Fig. 3, 1778.

Orchelimum agile, Scudd., Mat. for a Mon., 453, 1862.

Not *Xiphidium agile*, Red., Mon. der Con., 186, 1891.

There is considerable uncertainty concerning the status of this species. Redtenbocher made *O. vulgare*, Harr., a synonym, but Blatchley points out that Redtenbocher's measurements do not agree with those of *vulgare*. The species as determined by Scudder, as it is represented in my collection, has the under sides of the hind femora spined. Maryland, Illinois, Scudder; Kansas, Nebraska, Bruner; Montreal, Canada, Caulfield; New Jersey, Smith; New York, Beutenmüller.

ORCHELIMUM NIGRIPES, Scudd.

Orchelimum nigripes, Scudd., Ent. Notes, IV., 62, 1875.

Xiphidium nigripes, Red., Mon. der Con., 188, 1891.

The range of this species seems to be from the Rocky Mountains to Indiana, and Texas to Nebraska. It has not been reported east and south of the Mississippi and Ohio.

ORCHELIMUM NITIDUM, Red.

Xiphidium nitidum, Red., Mon. der Con., 189, 1891.

Georgia, Redtenbocher.

ORCHELIMUM BRUNERI, Blatch.

Orchelimum Bruneri, Blatch., Proc. Ind. Acad. Sci., 139, 1893.

This species is apparently closely related to my *O. volantum*, and it may prove identical. Said by Blatchley to be "common on the leaves and stems of a tall, broad-leaved knot-weed (*Polygonum amphibium*), which grows luxuriantly in the shallow waters about the margins of two or three large ponds in the Wabash River bottoms." The same authority reports it from the margin of Lost Lake, Marshall Co., Ind.

ORCHELIMUM VOLANTUM, McNeill.

Orchelimum volantum, McNeill, Psyche, VI., 26, Feb., 1891.

Found only on *Sagittaria variabilis*, in a single locality on the banks of Rock River, Illinois, near Cleveland, Henry County. It makes more use of its remarkably long wings than any other species of the genus known to me.

ORCHELIMUM LATICAUDA, Red.

Xiphidium laticauda, Red., Mon. der Con., 190, 1891.

New Orleans, Redtenbocher.

NOTES ON SOME NORTH AMERICAN YPONOMEUTIDÆ.

BY HARRISON G. DYAR, WASHINGTON, D. C.

(Continued from page 41.)

Genus GLYPHIPTERYX, Hübn.

Hübn., Verz. Bek. Schmett., 421, 1816; Wals., Proc. Zool. Soc. Lond., 1897, 118.

Synopsis of Species.

Hind wings narrowly oblong, the fringe about as long as the width of the wing.

A series of black and silver dots along the margin of wing at anal angle.

Fore wing with a straight white line across the middle.

A purplish space subterminally, with three white dashes on costa *bifasciata*, Wals.No purplish space, but a nearly continuous white line beyond the middle line *unifasciata*, Wals.Fore wing with a white costal bar at middle, preceded and followed by white lines that converge toward inner margin *quinqueferella*, Wals.

Fore wing without such spots on the margin.

A curved white streak on middle of inner

margin *impigritella*, Clem.
(= *exoptatella*, Chamb.)

This white streak not curved.

This white streak a triangle without a costal dot opposite it *circumscripta*, Chamb.This streak with an opposed white costal streak *California*, Wals.

Hind wings broader, the fringe much shorter than the width of the wing.

Fore wing with no costal white streak except at the apex, the other lines being lead colour *regalis*, Wals.

Fore wing with white costal streaks.

No conspicuous white streak on middle of inner

margin *quadragesimipunctata*, Dyar.A white streak on the middle of inner margin *montisella*, Chamb.*G. quadragesimipunctata*, n. sp.

Fore wings dark brown, the apex golden; seven yellowish white dots on the costa, the third from the base continued as a white line across the

wing to the inner margin, the fourth an oblique dash crossing the wing about one-third its width; 5th at the end of a curved opalescent line that runs across the wing to tornus; 7th produced as a short opalescent line; 8th as a longer opalescent line that ends on middle of outer margin; disk broadly blackish, thickly filled in with little yellow dots that appear opalescent in certain lights. Hind wings blackish brown, the fringe paler; abdomen white ringed, especially below; legs black spotted outwardly. One female, expanse 14 mm. Onaga, Kansas (F. F. Crevecoeur). U. S. Nat. Mus. Type No. 4424.

GENUS CHOREUTIS, Hübn.

Hübn., Verz. Bek. Schmett., 373, 1816.

Synopsis of Species.

Fore wing ochreous at tip..... *inflatella*, Clem.
 Fore wing not ochreous at tip.

Fore wing broadly ochreous at base..... *silphiella*, Grote.

Fore wing slightly ochreous at base in streaks or not at all so.

Extreme base of wing dark.

Dark basal space contracted, the middle of the wing filled in by a purplish cloud containing black specks.

This cloud edged by a distinct white

line..... *onustana*, Walk.

Edges of this cloud only a lighter shade of purplish.

Outer edge of cloud irregular, dentate; two ochreous streaks at base. *bjerkandella*, Thunb.

Outer edge of cloud defined by a curved line; no ochreous at base *sororculella*, Dyar.

Dark basal space not contracted, occupying half the wing, the pale cloud occupying the terminal half with the black specks segregated into a patch below vein 5.

Basal space crossed by a white line.

This line curved *occidentella*, Dyar.

This line straight. *extrinsicella*, Dyar.

Basal space without a traversing

line..... *Coloradella*, Fern. MS.

Extreme base of wing whitish gray..... *leucobasis*, Fern. MS.

C. inflatella, Clem., Proc. Ent. Soc. Phil., II., 5, 1863; *virginiella*, Clem., Proc. Ent. Soc. Phil., III., 505, 1864.

I cannot distinguish Clemens's two species, described as *Brenthia*.

C. sororculella, n. sp.

Generally similar to *hjerkindella*, Thunb., but without any traces of the yellow dashes at the base of fore wings. The pale gray space in the middle of the wing is sharply limited without and within by a paler line; in the centre of this space is a large group of black and metallic scales; beyond the pale line are no black scales, but a regular, distinct, subterminal metallic line; a subcostal metallic streak in basal space. Hind wings with a white dash as in *onustana*. Two examples. Placer Co., California. June (A. Koebele); U. S. Nat. Mus., type No. 4426.

C. occidentella, n. sp.

Grayish brown; basal half of wing of this colour, with a curved white line across its centre. Terminal half of wing filled, except somewhat narrowly along outer margin, by a large whitish patch, irrorate with brown scales, containing above a small black patch and below a large quadrate one, cut by a whitish line transversely; silvery scales along costa basally, middle of wing, subterminally and in the black patch. Hind wings brown, immaculate. Below a faint, irregular, whitish, submarginal line on hind wings and two costal dots on fore wings. Expanse 14 mm. One male. California (coll. Beutenmüller). U. S. Nat. Mus., type No. 4428.

C. extrinsicella, n. sp.

Light brown, head and palpi whitish. Fore wing with basal half brown, crossed by a broad, straight, white line with a few silvery scales outwardly on costa. Terminal half of the wing nearly white except narrowly along outer margin, streaked above with longitudinal, somewhat cuneate, lines of black scales, below containing a single elongate, rounded, black patch with two groups of silvery scales; similar scales on outer border of white patch; outer half of fringe white. Hind wings pale brown. Expanse 12 mm. One male. Wisconsin. U. S. Nat. Mus., type No. 4427.

Genus THELETHIA, Dyar.

Dyar, CAN. ENT., XXV., 301, 1893; *Thia*, Hy. Edw. (preoc. Col. 1840); Hy. Edw., Ent. Am., III., 181, 1888; Kirby, Cat. Lep. Het., I., 901, 1892.

T. extranea, Hy. Edw., Ent. Amer., III., 181, 1888; Smith, List. Lep. Bor. Am., No. 956, 1891; Dyar, CAN. ENT., XXV., 301, 1893.

I include this genus here tentatively. I have not seen a specimen in six years, and my old notes give only the venation. It may be a *Tineid* near *Incurvaria*.

FURTHER OBSERVATIONS UPON BOMBYX CUNEA, DRURY, ETC.

BY THE REV. THOMAS W. FYLES, SOUTH QUEBEC.

To make my way clear I beg to state the objects I had in view in writing the article that appeared under my name in the number of the CANADIAN ENTOMOLOGIST for last May. They were these :

I.—To establish the identity of the *Spilosoma Antigone* of Strecker with the *Spilosoma congrua* of Walker.

II.—To show that Dr. Riley's series of wings in Fig. 87, *Packard's Forest Insects*, does not afford a proof conclusive that *cunea*, *textor*, *punctata* and *punctatissima* are one and the same species of insect.

III.—To bring into notice a *Spilosoma* which answers to the figure given by Drury of his *Bombyx cunea*.

I.—It is admitted that *Antigone* and *congrua* are identical. I need not say anything more on that point.

II.—I have always looked upon Riley's series of wing-figures with distrust—much as I should regard a catena brought forward by a controversialist to support an erroneous opinion ; and, in the paper I have mentioned, I endeavoured to show the weakness of his position by stating that a like series of wing-figures could be taken from specimens of moths raised from "black ground-feeding larvæ." It has been said "*there is no doubt at all of the identity of all these forms,*" and if a positive assertion could have settled the matter, it would have been settled ; but a chain is not stronger than its weakest links, and Sir James Smith *was not sure* of the identity of *punctatissima* with Drury's *congrua*, and Dr. Ottolengui gives voice to a doubt, which others beside himself have felt, and says : "Is it possible that the immaculate and the spotted forms of *cunea* may be distinct?" (By these "forms" I understand him to mean *punctatissima* and *textor*.)

Smith and Abbot give us a picture of their *Phalena punctatissima*. There is an irregularly spotted male insect, a spotless female, and a larva feeding upon a sprig of mulberry. Quite a fancy sketch ! And this is the description appended :

"Ph. *Bombyx elinguis*, alis deflexis corporeque niveis nigro punctatis, thorace utrinque lunula nigra."

And under this is a note (the italics are mine) :

"Whether this be the *cunea* of Mr. Drury or not, it deserves a more expressive, or rather a less erroneous, name. The character above given applies to the male only, the female being entirely white."

Now, Dr. Dyar tells us that "Walker knew *cunea*, Drury" (CAN. ENT., v. XXXI., p. 155), very well. What does Walker say about the female of the species? This is what he says: "*Female*—Hind wings with some brown submarginal spots."

There is no warrant whatever for speaking of an *immaculate cunea*, Drury—whether male or female. Drury neither figured nor described such an insect.

I hope it will be understood that when I have spoken of *cunea* I have meant Drury's *cunea*—not the insects that of late have been erroneously called by that name. When I have spoken of moths from fall webworms, I have designated them as such, or I have used the term given by Harris for the northern immaculate insect, and the term given by Smith and Abbot for the southern spotted insect.

Hyphantria textor, Harris, and *Phalena punctatissima*, S. and A., are supposed to be (though Harris had no idea that they were) seasonal varieties of one and the same species of moth—a moth that comes from the fall webworm.

In Canada we have only one brood of this species in the year, but southward there are two generations of it. Thus Dr. Wm. Saunders writes:

"In the northern United States and Canada there is only one brood of this insect in the season, but in the south it is frequently double-brooded, the first brood of the larvæ appearing in June, the second in August."—*Insects Injurious to Fruits*, p. 73.

And Dr. L. O. Howard writes:

"In the District of Columbia and north to New York City there are two generations annually." * * * * *

"The caterpillars of the second generation begin to make their appearance in force in August."—*Farmers' Bulletin No. 99*, p. 20.

It is, I presume, the moths from this *second* generation that Dr. Ottolengui refers to in his "Contribution, etc.," in the December number of the CANADIAN ENTOMOLOGIST, pp. 358-9.

With his remarks, as to the profuse spottedness of these early moths, agreed, in part, the words of Mr. James S. Johnson, who wrote from Frankford, Pennsylvania, in August, 1880, and said:

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

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

* * * * *

"In the first brood every male had the black spots on the primaries, from a single spot on each wing to almost covered, *and in some examples a spot on the secondaries*. In the second brood all were bright, not an example with the least trace of a mark, *the females in both broods entirely white*."—CAN. ENT., vol. XIII., p. 18.

The italics in the above quotation are mine.

Mr. Johnson asked these questions: "Has the first brood, or that which remains over winter only, the black spots? or does *H. textor* alternate?"

As far as my knowledge extends, these questions have not been answered. No one has come forward to say, "From eggs laid by *H. textor* I have raised a brood of *H. punctatissima*," or, *vice versa*, "From eggs laid by *H. punctatissima* I have raised a brood of *H. textor*." If I am mistaken in this I shall be glad if someone will tell me *when* and *where* and *by whom* the statement has been made.

As regards our northern examples of *textor*: I have ten moths (males and females) that I have raised at different times from fall webworms. Not one of them has any appearance of a spot at the base of the second fork of the median nerve, such as is shown in "f" of Riley's "Fig. 86," in *Packard's Forest Insects*, and "a" in "Fig. 87" of the same work.

The dimensions of the moths that come from fall webworms have been given as follows:

In the New England States—One inch and a quarter to one inch and three-eighths—Harris, *Ins. Inj. to Veg.*, p. 358.

In Canada—One inch and a quarter—Saunders, *Ins. Inj. to Fruits*, p. 73.

In the Southern States—One inch and one-tenth—Howard, *Farmers' Bulletin No. 99* (by figures), pp. 24 and 26.

We must accept the dimensions given by these authorities as reliable. From them it appears that the Southern specimens of moths from fall webworms are smaller than the rest. What the very large moths, that have

been mistaken for and associated with *H. textor*, really are must be determined by further careful breeding.

III.—American Entomological literature is rich in synonyms, and Dr. Dyar seems ambitious to add another to the list (see his "*Correction*" in the January number of the CANADIAN ENTOMOLOGIST).

The following is the description of *Spilosoma prima*, Slosson :

"Size of *S. virginica*, but a stouter insect, body heavier and shorter, scarcely reaching anal angle of secondaries. Primaries sordid white, stained with ochreous, especially along costa and inner margin, and with scattered dots of dark brown. These are arranged almost exactly as in some specimens of the form of *H. textor*, Harris, known as *cunea* and *punctata*. The dots are much heavier and more distinct on costa, and there is a submarginal line very plainly indicated and composed of geminate dots on the venules. Secondaries sordid white. Abdomen thickly clothed with white hairs, through which can be seen the yellow of the body, with dorsal row of black spots. Palpi, coxæ and tibiæ very dark smoky brown, almost black."—*Ent. Amer.*, V., 40 (1889).

And these are some of the points in which this insect seems to differ from the *Spilosoma* taken at Quebec and believed to be the *Bombyx cunea* of Drury :

S. PRIMA, SLOSSON.

Size of *S. virginica*.

Stouter than *Virginica*.

A submarginal line of geminate dots on primaries.

Secondaries sordid white (no mention of spots).

Dorsal row of black spots on abdomen.

Tibiæ very dark smoky brown.

THE QUEBEC INSECT.

Smaller than *S. virginica*.

Not so stout as *Virginica*.

A submarginal line of dashes and streaks on primaries.

Secondaries much spotted, as in Drury's figure.

Five rows of black spots on abdomen (Drury's figure shows dorsal and side lines. The under side of the insect is not figured).

Tibiæ white on the outside, dark brown on the inner.

But supposing *S. prima*, Slosson, were shown to be identical with the insect I have described, that would not prove that *Phalena punctatissima*, S. and A., is one with *B. cunea*, Drury : it would rather indicate that we have had one more synonym in our literature than we have been aware of.

I do not know that I can say any more on the subjects that we have had under discussion. I trust that I have written with befitting modesty, and that I have given the reasons for my statements with sufficient clearness. After weighing all that has been written, I am convinced that *Hyphantria textor*, Harris, is not one and the same with *Bombyx cunea*, Drury, and that the insect I have described as *cunea* more closely corresponds to Drury's figure than any other moth, or any figure or description that has come under my notice.

NOTE ON CYANIRIS PSEUDARGIOLUS OF BOISDUVAL AND LE CONTE.

BY ARTHUR G. BUTLER, PH. D., BRITISH MUSEUM, LONDON, ENGLAND.

In 1782, Cramer described and figured a *Cyaniris* (Pl. CCLXX., figs. D, E), and incorrectly gave the Cape of Good Hope as its locality.

In his "Rhopalocera Africæ Australis," Mr. Trimen described the species from a single example labelled "S. Africa" in the British Museum collection, and stated that this was the only example he had seen. In his later work this species is ignored, Mr. Trimen having evidently satisfied himself that it never came from any part of Africa. On looking up the authority for the locality of the specimen mentioned by Trimen in our oldest "Register of Accessions," I find it entered as "*P. Ladon*, Cram., n., S. Africa?" the locality having evidently been entered on Cramer's authority.

As a matter of fact, Cramer's insect is undoubtedly *Cyaniris pseudargiolus*, which it necessarily supersedes, and our reputed African example is a large specimen of the form *marginata*, rather less suffused than usual on the under surface.

It is always inconvenient to alter the names of well-known and abundant species, but under the circumstances I do not see how it can be avoided in the present instance: it will perhaps have one advantage — as *C. pseudargiolus* is not half so nearly related to *C. argiolus* as it is to the Sikhim species, *C. dilectus*, an inappropriate name is suppressed.

A NEW OAK-GALL FROM NEW MEXICO.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

Dryophanta Porterae, n. sp.—♀. Length, $2\frac{1}{3}$ mm.; very dark brown; cheeks, tibiae more or less, and antennæ except tips, clear ferruginous; smooth and shining, parapsidal grooves distinct; head transversely quadrate, broader than long; antennæ 13-jointed, 13 a little longer than 11 and 12, 3 about a third longer than 4 (3 about 200 μ , 4 about 150 μ , 13 about 180 μ); scutellum prominent; ovipositor rather long, ferruginous, its apical portion with six rings, counting the apex as one;

wings delicately hairy, marked with blackish, nervures suffused with black, marginal nervure almost but not quite attaining the costa at its distal end, a suffused black cloud beneath the end of the marginal cell, a double one in the apical field, a small and indistinct one beyond the apex of the marginal cell, and a faint cloud on the lower part of the wing.

Gall.—On under side of leaf of *Quercus undulata* (true *undulata*, not *Gambelii*), on each side of midrib, sometimes as many as eight on a leaf, gall a thin-shelled depressed sphere, light ferruginous, rather shiny, smooth, surface microscopically tessellate, basal portion with a thin inconspicuous pubescence.

Hab.—Las Vegas Hot Springs, N. M., Jan., 1900 (*Miss Wilmatte Porter*). Fly emerged Jan. 30. I had taken the galls to be those of *D. glabra*, Gillette, which I found in Wet Mountain Valley, Colorado, on leaves of *Quercus Gambelii*. The fly, however, proves quite different from that of *glabra*, and more nearly allied to *D. pulchripennis*, Ashm., and *D. bella* (Bassett). From both of these it differs by the 13-jointed antennæ; from *pulchripennis* also by its dark colour, from *bella* by the much smaller galls. The only other western *Dryophanta* which has 13-jointed antennæ in the ♀ is *D. nubila* (Bassett), but this has densely hairy galls.

PYRAMEIS HUNTERA, N. VAR. FULVIA.

BY G. M. DODGE, LOUISIANA, PIKE CO., MISSOURI.

Expanse one and six-eighths inches. It differs from the usual form of *Huntera* by its smaller size, its paler colour, and by being more broadly fulvous. The fuscous of the primaries is reduced to a black crescentic line at end of discal cell, a dark costal border and a small patch at apex enclosing the white spots. This apical patch is pale, and is outwardly invaded by fulvous.

The large, somewhat crescent-shaped spot that extends from the costa is fulvous, scarcely lighter than the surrounding parts, and is margined, inwardly, with a narrow black line.

On the posterior half of the wing the usual black marks are much reduced in area.

On the secondaries the costal shades are small and pale. The border is narrow, merely a line of crescent shaped black spots, sharply defined by an outer fulvous line, beyond which a series of dark spots dot the margin, interrupting the white fringe.

Below much like typical *Huntera*, but paler and showing less blue.

Fulvia appears to be a spring form of *Huntera*, perfectly fresh examples being taken here May 2nd to 12th. It varies slightly in showing more or less of the dusky clouding, but its small size and pale fulvous primaries distinguish it at a glance from typical *Huntera*, in which the apical half of the wing is black.