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CANADIAN HYMENOPTERA—No. 5.

BY W. HAGUE HARRINGTON, F. R. S. C., OTTAWA.

This paper contains descriptions of some apparently new species of ichneumons from British Columbia. Most of these are contained in a very interesting collection made by the Rev. G. W. Taylor, during his residence at Cedar Hill, near Victoria, V. I. When Mr. Taylor left Ottawa to return to Victoria, about three years ago, he very generously handed over to me his Hymenoptera, only asking that I should publish a list of the species. To enable me to fulfil this request, I have found it necessary to first prepare descriptions of the new species.

Sub-family ICHNEUMONINÆ.

ICHNEUMON TAYLORII, n. sp.

Male—Length, 15–16 mm. Ferruginous varied with yellow. Head ferruginous on vertex, the posterior margin, a spot enclosing the ocelli and another above the antennæ, black; face, cheeks below, mandibles and palpi yellow; antennæ long and slender, black, with scape yellow. Thorax with the sutures more or less black; the mesonotum, upper margin of pleura and base of metathorax ferruginous; remainder yellow, including the scutellum; legs almost yellow, the posterior femora, apical half of tibiæ and the tarsi pale ferruginous; coxæ yellow, the middle and posterior pairs with a black spot within; wings yellowish hyaline, nervures piceous, stigma yellow, costa ferruginous. Abdomen with the basal segments varied with yellow, the terminal ones almost ferruginous; postpetiole and base of following segment aciculated, gastrocœli shallow; one specimen has a narrow black line at base of segments 3–5, the other has only a black spot on petiole beneath.

This handsome species is described from two ♀ specimens from Victoria, V. I., collected by my friend, the Rev. G. W. Taylor, F. R. S. C., after whom I have much pleasure in naming it.

ICHNEUMON OCCIDENTALIS, n. sp.

Female—Length, 11 mm. Rufo-ferruginous. Head rufous, subtuberculate beneath antennæ, face sparsely punctured; antennæ black, thickened towards apex, with a white annulus, scape rufous. Thorax mostly black; the mesonotum, scutellum and spot at base of metathorax rufous, legs entirely rufous, except apical joint of tarsi, which is brownish. Abdomen rufous; postpetiole and two following segments closely opaquely punctured, remaining segments shining; gastrocœli oblique, linear; a strong transverse depression near apex of the same segment.

Described from one ♀ specimen taken at Victoria, Vancouver Island, in Nov., 1890, by Mr. Taylor.

PLATYLABUS PACIFICUS, n. sp.

Female—Length, 9 mm. Black, with rufous abdomen and legs. Head small, closely punctured; palpi reddish, antennæ entirely black, slightly stouter beyond the middle. Thorax closely punctured, the pleuræ more coarsely; metathorax rugose, excavated behind; carinæ indistinct, angles subspinose; legs rufous, coxæ and trochanters black; wings subhyaline, stigma and nervures reddish, areolet pentagonal. Abdomen rufous, polished, except postpetiole, which is aciculated, with two dorsal carinæ not reaching the apex; ovipositor slightly exerted.

Described from one ♀ specimen from Vancouver Island (Taylor).

CENTETERUS CANADENSIS, n. sp.

Female—Length, 5 mm. Black; legs and band on abdomen rufous. Head large, vertex and cheeks polished, face punctulate; mandibles rufous, palpi pale; antennæ black, scape oval, red beneath, joints 3-5 subequal, about twice the length of the remaining joints, which are about as broad as long. Thorax black, shining, the mesonotum and pleuræ with sparse faint punctures, the metathorax distinctly areolated, the angles spiniform; legs rufous, the posterior coxæ, tibiæ at apex and tarsi piceous. Abdomen polished, first and apical segments black; two, three and base of four rufous.

Described from 3 ♀ specimens from Victoria, V. I. (Taylor.)

HERPESTOMUS FLAVICOXÆ, n. sp.

Male—Length, 6 mm.—Black, with rufous legs. Head black, front rounded, sparsely punctate; clypeus, mandibles and palpi yellow; antennæ stout, black above, piceous beneath, scape yellow. Thorax black,

mesonotum sparsely punctulate ; scutellum with fine central carina ; metathorax distinctly areolated, the posterior face striated ; legs red, four anterior coxæ and trochanters yellow, posterior coxæ black, tipped with yellow, trochanters yellow, spotted above with black, tips of posterior tibiæ and their tarsi brownish ; wings hyaline, a little dusky, stigma and nervures dark, areolet rather large, pentagonal. Abdomen black, with the incisures and lateral margins rufo-testaceous.

Described from one ♂ specimen from Victoria, V. I. (Taylor.)

Sub-family CRYPTINÆ.

CRYPTUS VANCOUVERENSIS, n. sp.

Female—Length, 11-15 mm. Black, with rufous abdomen and legs. Head transverse, not much swollen behind the eyes, closely punctured, inner orbits narrowly whitish ; a rounded shining tubercle below the antennæ ; clypeus swollen, shining, touched with white in one specimen ; palpi blackish ; antennæ long and slender, black, the scape rufous beneath. Thorax entirely black ; the pleuræ and metathorax closely, almost rugosely, punctured ; metathorax not distinctly areolated ; mesonotum and scutellum shining, finely and sparsely punctulate ; wings fuliginous with violaceous reflections ; tegulæ piceous ; legs, including coxæ and trochanters, bright red ; terminal joint of tarsi piceous ; posterior tibiæ darker toward apex, the tarsi yellowish. Abdomen entirely red, highly polished ; the ovipositor as long as abdomen without petiole, red, the sheaths black.

This handsome species is described from three ♀ specimens from Victoria, V. I. (Taylor.)

CRYPTUS VICTORIENSIS, n. sp.

Female—Length, 7-9 mm. Black ; abdomen and legs mostly rufous. Head subrugosely punctured beneath antennæ, closely but more finely above ; inner orbits and edge of clypeus narrowly white ; antennæ long, slender, black, with a short white line above on joints 9-11. Thorax coarsely punctured, but somewhat shining, scutellum polished, with few punctures ; metathorax rounded, with transverse carina, but not areolated ; collar, tegulæ, scutellum and posterior angles of metathorax with minute white dots ; legs rufous, including coxæ, posterior tibiæ and tarsi black, the former with a pale annulus near the base, the latter with joints 2-4 white in one specimen, but partly black in the other ; wings almost hyaline, areolet small, nearly quadrangular. Abdomen polished rufous ;

postpetiole with scattered punctures, second segment strongly and densely punctured, third more finely, remainder polished, scarcely punctate; petiole partly and the three or four terminal segments black, the latter narrowly margined with white; ovipositor one-half as long as abdomen, sheaths black.

Described from two ♀ specimens from Victoria, V. I. (Taylor). A pretty little species resembling somewhat in coloration *C. extrematis*, Cress., but easily separated by the smaller size and the much coarser punctuation.

CRYPTUS FLAVIPES, n. sp.

Female—Length, 4 mm. Black, with yellowish legs. Head small, finely punctulate, vertex shining; spot on mandibles and palpi pale; antennæ wanting. Mesonotum polished; metathorax rounded, closely punctured, without distinct carinæ; legs, including coxæ, pale rufo-testaceous, tips of posterior tibiæ and tarsi darker; tegulæ pale, nervures brownish, stigma paler. Abdomen with first and second segments closely, finely punctulate; terminal segments with apical margins indistinctly whitish; ovipositor as long as abdomen, red, with piceous sheaths.

Described from one ♀ specimen from Victoria, V. I. (Taylor).

CHÆRETYMMA ASHMEADII, n. sp.

Female—Length, 8 mm. Black, with red legs. Head transverse, as wide as thorax, polished, eyes prominent, front with sparse punctuation, slightly concave, with a small shallow basin above each antenna; cheeks polished, impunctate; face below antennæ finely opaquely punctured; palpi pale; antennæ wanting. Thorax entirely black, very slightly pubescent; sides of prothorax striated; mesonotum prominent, the middle lobe slightly advanced, polished with sparse fine punctures, pleuræ closely, not coarsely, punctate; scutellum polished; metathorax closely punctured, opaque; posterior transverse carina distinct, but metanotum not areolated; legs, including coxæ and trochanters, entirely red; wings rather small, slightly infumated, nervures and stigma piceous, areolet medium in size, subpentagonal, considerably higher than wide. Abdomen as long as head and thorax, black; first segment gradually expanded to tip, finely opaquely punctulate and with fine lateral carinæ; second segment as wide as long, also finely opaquely punctulate, except at apex; remaining segments polished; the ovipositor longer than abdomen, red, with black, polished sheaths.

Described from one ♀ specimen from Victoria, V. I. (Taylor), and named after Mr. W. H. Ashmead, as a slight recognition of the invaluable assistance which I have received from him in my studies of the Canadian hymenoptera. He kindly examined this species, and states that it "comes nearest to *Cryptus velox*, Cr., judging from description. I have another specimen in my collection from Colorado, but with the ovipositor a little shorter than in your specimen." It differs, however, from *C. velox* (to which I refer a species taken at Ottawa) in the entirely red legs, the darker wings with narrower areolet, the finer sculpture of metathorax, the shorter ovipositor with non-pubescent valves, etc., although the general appearance of the two species is much the same.

HEMITELES OCCIDENTALIS, n. sp.

Female—Length, 5 mm. Black, with rufous abdomen and legs. Face subtuberculate; edge of clypeus and mandibles rufous, palpi pale; antennæ piceous, the scape and basal joints of flagellum partly rufous. Metathorax areolated; legs, including coxæ, rufous, also the tegulæ. Abdomen polished; the petiole black, and terminal segments dusky; ovipositor as long as abdomen, sheaths piceous.

Described from one ♀ specimen from Victoria, V. I. (Taylor.)

HEMITELES PICEIVENTRIS, n. sp.

Female—Length, 3.5 mm. Black, with piceous abdomen and pale legs. Head finely punctulate above; palpi pale, antennæ piceous, 23-jointed. Thorax shining, the mesonotum finely punctulate, metathorax not spined, carinæ feeble; legs yellowish, the coxæ and posterior tarsi almost piceous; tegulæ pale, nervures and stigma brownish. Abdomen piceous, shining, the first and second segments finely punctulate, ovipositor scarcely as long as abdomen.

Described from one ♀ specimen from Victoria, V. I. (Taylor.)

CREMNODES CANADENSIS, n. sp.

Female—Length, 4.5 mm. Rufo-testaceous. Head viewed from above sub-quadrate, the face swollen as in *Exochus*, punctulate beneath antennæ; eyes small; antennæ 18-jointed, almost as long as body and moderately robust. Thorax more strongly constricted than in *Pezomachus*; metathorax sharply truncate and the angles strongly spined. Abdomen with the first segment slender, not expanded posteriorly, remaining segments compressed laterally, truncate at apex and strongly polished, the second more than twice as long as all the others; ovipositor very short.

Described from one ♀ specimen from Queen Charlotte Islands, sent by the Rev. J. H. Keen to Mr. Fletcher. A very interesting wingless species, with rufous head and abdomen, and testaceous thorax and legs. The compressed abdomen is more like that of an ophionid than of a cryptid.

PEZOMACHUS KEENII, n. sp.

Female—Length, 3–4 mm. Fulvo-ferruginous. Head slightly darker than rest of body; antennæ 19–20 jointed, more or less obscured toward apex; cheeks polished. Thoracic nodes subequal, not very prominent, faintly sulcate; legs concolorous with thorax. Abdomen ovate beyond the first segment, which is rather suddenly expanded posteriorly; terminal segments slightly yellow in one specimen; ovipositor very short, sheaths black.

Described from four ♀ specimens from Queen Charlotte Islands, collected by the Rev. J. H. Keen, after whom I have much pleasure in naming the species, as a recognition of his efforts to advance our knowledge of the insect fauna of this distant portion of the Dominion.

SUBDIVISION OF THE PIERINÆ BASED ON PUPÆ.

BY J. W. TUTT, F. E. S., LONDON, ENGLAND.

An oversight (*ante*, p. 167, line 27) leads me to state that it is in the Aporid section of the *Pierinæ* that the pupa has the abdominal segments 5 and 6 moveable, whilst in the Pierids proper only 5 is moveable. The *Pieridi* have until now always included the Aporid section; as a matter of fact, many European systematists have placed our *Aporia crataegi* in the genus *Pieris*.

There can be no doubt that *Aporia* represents a very ancestral form of the *Pierinæ*, and, as such, is structurally different in all its stages from its Pierid allies; at the same time I am firmly convinced that the *Aporidi* is as distinct from the *Pieridi* as is the *Anthocharidi*.

I am looking forward, with some degree of interest, to the records of observers which will tell us the American species of *Pierinæ* that have the pupæ with two (5 and 6) moveable abdominal segments (*Aporidi*); which species have but one (5) moveable segment (*Pieridi*), and which are solid (*Anthocharidi*), and how far the structure of the pupa agrees with the neuration of these types.

AN OMITTED PHYCITID.

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

I have not been able to find in the Philadelphia List of Lepidoptera the following species:—

DIORYCTRIA, Zell.

Reniculella, Grt. (*Pinipestis*), N. Am. Ent., 67; Pack., Bull. Dep. Agr. Ent., xiii, p. 21, 23; Fifth Rep. on Insects Inj. to Forest and Shade Trees, 854; Romanoff, Mem. Sur les Lep. Tome vii., Ragonot id. 200, Planche xxii., fig. 12.

My type is in the British Museum, where it has been examined by M. Ragonot, who compares it in his description with the European *D. abietrella*, from which this authority finds it to differ structurally. The figure in M. Ragonot's magnificent work seems to me excellent. I take this occasion to express my dissent from the classification adopted in the Philadelphia List. In 1878 I separated the *Epipaschiinae* (*Epipaschiæ*) from the *Phycitinae* (*Phycidæ*). The two groups I regard as divisions of the Pyralidæ, equal in value to the *Crambinae* and *Galleriinae*. So far as I can discover, I first drew attention to the peculiar structure of the female frenulum in the *Phycitinae*. At the time I did not know that the old term *Phycis* (used also by Walsh for our American species) had been superseded by *Phycita*. Messrs. Scudder and Burgess first gave us genitalic species; Lederer had used the genitalia for subgeneric and generic divisions, and latterly is followed by Smith. Now comes Mr. Hulst, whose mission seems to be to carry out the methods of other entomologists to extremes, and gives us genitalic subfamilies.

Besides the above-mentioned species of *Dioryctria*, Mr. Ragonot figures the following North American *Phycitinae* originally described by me: *Salebria contatella* and var. *quinque punctella*, *Meroptera pravella*, *Dioryctria aurantiacella*, *Pyla scintillans*, *Nephoptyx scobiella*, *Ambesa lactella*, *Dioryctria* (*Pinipestis*) *Zimmermanni*, *Acrobasis tricolorella*, *A. demotella*.

In my paper alluded to above, Bull. U. S. Geol. Survey, I gave, for the first time in American scientific publications, figures of the neuriation and descriptions of the structure of the *Phycitinae*. At the time only the first part of my intended work was prepared for the printer. I had purposed the working out of all the American genera in my collection. We have now a most carefully written and beautifully illustrated work by M. Ragonot, which can be studied with pleasure and profit by all American students occupying themselves with the collection of these little but very interesting moths.

DESCRIPTION OF A NEW SPECIES OF DORYCEPHALUS.

BY HERBERT OSBORN, AMES, IOWA.

Dorycephalus platyrhynchus, n. sp.

♂—Head produced and very flat, rounded in front, wings reaching tip of abdomen; colour gray-brown. Length, 9 mm. Length of head, 2.3 mm.

Head thin foliaceous, margins very thin, a median, thicker space, which beneath widens to base of head, forming a convex keel. Eyes touching prothorax. Ocelli on margin of head, just in front of eyes, a rather obscure mottling of brown along the disk of the head and forming a rather distinct median stripe, a dark stripe under the tip of the head, dividing and passing along the margins of the keel, a distinct blackish line under the eye, and extended as a brownish stripe on thorax. Prothorax transverse, with five slightly elevated convex ridges, the anterior margin nearly straight, with slight sinuosities, the posterior margin concave in front of the scutellum. Scutellum wider than long, convex in front, with an acute point at the apex between bases of elytra, with a transverse furrow behind the middle, deflected laterally. Elytra strongly veined, costal margin arcuated, with a humeral furrow, very minutely punctate. Legs rather slender, anterior femora fuscous beneath. Middle and posterior femora with rows of fuscous dots forming a stripe beneath. Tibiæ fuscous beneath.

Described from two male specimens, one collected at Ames, Iowa, by Prof. C. P. Gillette, the other collected at West Point, Nebraska, by Prof. Lawrence Bruner.

Female larger than male; pale yellow, with dark median line on head and prothorax. Length, 14.5 mm. Head longer than in male, central carina above darker. Elytra short, reaching one-half way on to the 4th segment of the abdomen. Wings shorter, reaching nearly to posterior margin of the 2nd segment of the abdomen. Abdomen elongate and acuminate. First 6 segments about equal in length; 7th narrow, elongate and combining with remaining segments to form the sheath of ovipositor. Ovipositor long, the sheath simple beginning at the 5th ventral segment.

Since forwarding the description of the male a special student in entomology, Mr. E. D. Ball, has brought in another male and the female here described.

The larger size and elongate, slender abdomen gives this quite a different appearance from the male, but I think there can be no question as to the identity of the two forms. The specimen in hand has somewhat the appearance of being fresh from the pupa stage, on account of the lighter colour and soft appearance of the body, but the wings appear fully developed, and in other respects it indicates maturity.

SOME INDIANA ACRIDIDÆ.—III.

BY W. S. BLATCHLEY, TERRE HAUTE, INDIANA.

In the two preceding papers of this series 36 species and 3 varieties of Acrididæ have been recorded as occurring in Indiana. Since the last paper, published in the ENTOMOLOGIST for February, 1892, appeared, five additional species have been taken within the State, and many facts have been gathered concerning the life history, habits and range of the species previously recorded. Moreover, my private collection has been largely increased by exchange for specimens from other parts of the United States, and I have possessed myself of almost all the literature extant upon the group, so that I am enabled to clear up a few mistakes in synonymy which crept into my first papers.

ACRIDIDÆ.

ACRIDINÆ.

OEDIPODINI.

1. AULOCARA SCUDDERI, Bruner.

Aulocara Scudderi, Bruner, Proc. U.S. Nat. Mus., XII., 1890, 63.

This small locust was first taken in Indiana on July 6th, 1892, from the sandy bed of the old Wabash and Erie Canal, five miles north of Terre Haute, Vigo Co. Other specimens were secured at the same locality in September of that year, and in September and October of 1893.

On one side of the canal, at the point mentioned, is a large pond, occupying perhaps 50 acres of the Wabash River bottoms, and on the other side is a sandy hill or bluff of the river, which is covered with typical prairie grasses and plants. The locust has been found only in an area of about five acres, on the side of the hill, and in the bed of the canal. When disturbed it leaps vigorously, and without noise, for several times in succession; then, settling down on a sandy spot, it will allow a close approach, evidently relying upon the similarity of colour between its body and the sand to shield it from observation. According to Bruner, *loc. cit.*, it is a very common species west of the Mississippi; but this I believe, is its first record east of that stream, unless the species mentioned by McNeill, in his "Illinois Orthoptera,"* as *Philobostroma parva* (?), be the same.

*Psyche, VI., 64.

2. SPHARAGEMON OCULATUM, Morse.

Spharagemon oculatum, Morse, Proc. Bost. Soc. Nat. Hist.,
XXVI., 1894, 232.

On August 1, 1892, I visited Lake Maxinkuckee, Marshall Co., Indiana, and in a sandy, fallow field, near the south-western border of the lake, I found this locust to be quite abundant in company with *Spharagemon bolli*, Scudder. They never leaped when disturbed, but used the wings to propel them in a flight of about 30 yards; the males making a faint crackling noise as they cleared themselves from the earth, while the females were noiseless. A number of pairs were taken in copulation on this date.

On August 17, 1893, I again visited the locality, and found the field to be in corn, but the *Spharagemon* was very common over about two acres of the most sandy portion. Resting on the soil between the rows, they were very difficult of detection, and eight times out of ten were not seen until flushed, unless they had previously been "marked down" as they alighted. A few were also taken from the sandy margin of the lake, but careful search over a wide extent of territory failed to reveal them elsewhere.

Without specimens for comparison, and from the literature at hand, I determined them doubtfully as *Spharagemon collare*, Scudder, and sent specimens so named to Prof. A. P. Morse, who was making a detailed study of the genus. He found that they differed from the type specimens of *collare* in Mr. Scudder's collection, and so described them as new, under the name cited above.

3. TRIMEROTROPIS MARITIMA (Harris). The Maritime Locust.

Locusta maritima, Harris, Ins. Inj. to Veg., 1862, 178.

Oedipoda maritima, Uhler, in Harris Rep., *loc. cit.*

Scudder, Bost. Journ. Nat. Hist.
VII., 1862, 472.

Thomas, Syn. Acrid, N.A., 1873, 124.

Trimerotropis maritima, Stal, Recens. Orth., I., 1873, 135.

Scudder, Dist. Ins. N. Hamp., 1874, 378.

Thomas, Ninth Rep. St. Ent., Ill., 1880, 113.

Fernald, Orth., N. Eng., 1888, 45.

Among a number of Orthoptera which were collected by Prof. E. E. Slick at Michigan City, Indiana, on September 18, 1892, and forwarded to me, was a single ♀ of this species. I immediately returned it to him with the request that, if possible, he secure a number of others. On October 15, there having been several severe frosts in the meantime, he sent 18 additional specimens, 6 of which were ♂'s. At the same time he wrote concerning them as follows: "Some were found dead and others could but jump one or two feet. I did not realize when the first lot was sent how nearly these were like the sand, because they were so wild. They were never more than 100 feet from the edge of the water (Lake Michigan), and never along even the hillsides."

The only record which has come under my notice of the occurrence of *maritima* west of the Atlantic coast is the brief one given by Thomas in his Ninth Illinois Report, *loc. cit.*, where he says: "This has been discovered only in the extreme northern part of the State;" but he does not state when nor by whom it was taken. McNeill includes it in his list of the Illinois Orthoptera (PSYCHE VI., 64), on the strength of the above statement by Thomas.

Mr. Scudder, in his Distribution of Insects in N. Hamp., *loc. cit.*, writes of it as follows: "This curious grasshopper is a good example of mimicry, for it so closely resembles the colour of the sand on a sea beach that it is difficult to see it when alighted. It is found only in such localities, and reaches its northern limit about the narrow part of the State washed by the sea. South-west it extends at least as far as New Jersey."

TETTIGINÆ.

4. TETTIX ARENOSUS, Burmeister,

Tettix arenosa, Burmeister, Handbuch II., 1838, 659.

Tettix arenosus, Scudder, Proc. Bost. Soc. Nat. Hist., XIX., 1877, 90.

Bolivar, Essai Sur. les. Tettig., 1887, 95.

Tettix ornatus, Scudder, Bost. Jour. Nat. Hist., VII., 1862, 474 (In part.)

Thomas, Syn. Acrid., 1873, 184 (In part.)

(Not *Tettix ornatus*, Say.)

In Indiana this grouse locust is much less common than *T. ornatus*, Say, with which species it has been confounded by many writers. Burmeister's description was so short and unsatisfactory that unless one could examine his types it is impossible to determine what species he had at hand.

Bolívar, in his "Essai," separates the group containing *ornatus* from that containing *arenosus* by the difference in the relative length of the pronotum, but collectors of these insects know that this character is of little value on account of its great variation in the same species. Moreover, he gives the length of pronotum of *ornatus* as 7.5-9 mm., and states that it does not exceed the tip of the posterior femora. A glance at Say's description and figure will show that he was wrong concerning both of these points, as the length of pronotum there, and the average length in many specimens at hand, is about 11.5 mm.

Arenosus, as I have it separated in my collection, is a somewhat shorter and broader species than *ornatus*, and with the median carina of the pronotum and vertex much more distinct. The granulations on the pronotum are longer and more irregularly distributed, and, especially on the posterior half, have a tendency to arrangement in short, oblique waves or ridges, while the median sulcus of the face is wider in its lower half than in *ornatus*.

The general colour of *arenosus* is darker and the annulations of the antennæ and legs are much more distinct than in *ornatus*, which in colour is an exceedingly variable insect. But little practice is necessary to quickly distinguish the two species in the field.

Arenosus in this vicinity is found in small numbers about gravelly hillsides, and occasionally in company with *T. cucullatus* about the borders of streams, while *ornatus* is a very common species in dry upland woods.

5. *TETTIX GRANULATUS* (Kirby).

Acridium granulatum, Kirby, "Fauna Bor. Am., IV., 1837, 251."

Tettix granulatus, Scudder, Bost. Journ. Nat. Hist., VII., 1862, 474.

Thomas, Syn. Acrid. N. A., 1873, 182.

Bethune, Can. Ent. VII., 1875, 130. (Copy of Orig. Desc.)

Riley, Rep. U. S. Ent. Comm., I., 1877, 256, fig. 11.

Bolívar, Essai Sur. les Tettig, 1887, 91.

McNeill, Psyche, VI., 1891, 77.

Tettix ornata, Harris, Ins. Inj. to Veg., 1862, 186. (Not
Tettix ornatus, Say)

I have found this species in both Vigo and Fulton counties, and McNeill, *loc. cit.*, has recorded it from Franklin Co., Ind.

In Vigo Co. it is evidently scarce, as I have taken it only in winter from beneath logs, in the vicinity of the large pond mentioned above, under *Aulocara Scudderi*. In Fulton Co., 150 miles north, I found it very common in the depths of a tamarack swamp, in company with *Tettigidea polymorpha*, Burm.

In life, the inner wings of *grauulatus* are bluish or bottle green, a character I do not remember to have seen noted by any previous writer.

It is an insect of wide distribution, extending from ocean to ocean, and northward through British America. Vigo county is probably near the southern limit of its range.

* *

NOTES ON SOME OF THE SPECIES MENTIONED IN THE PREVIOUS PAPERS.

LEPTY SMA MARGINICOLLIS, Serville. (C. E., XXIV., 28.*)

The only habitat of this species in Indiana, known to date, is the margin of the large river bottom pond mentioned in my previous paper. This has been partially drained, and, as a result, the locust was quite scarce in the autumn of 1893. I was much surprised, however, to find there, on May 21st, a fully developed male, with soft, flabby wings, as though just moulted, though no others of any age were seen on that date.

TRUXALIS BREVICORNIS, Linn. (C. E., XXIII., 75.)

This has proven to be a rather common species about the margins of marshes, ponds and lakes. In Vigo county it reaches maturity about August 10th. It has been taken in Fulton and Marshall counties, thus extending its known range 150 miles northward.

CHRYSOCHRAON VIRIDIS, Scudder. (C. E., XXIII., 75.)

The brown form of this species far outnumbers the green one in this locality. It has been taken in copulation as early as July 15. The spring and early summer of 1892 were very damp, it raining almost every day in the month of May. In the latter part of July hundreds of dead and dying specimens of this species and of *Melanoplus bivittatus*, Say, were

*The references refer to the volume of Can. Ent. in which the species was previously mentioned by myself.

to be seen in the tops of iron weeds. They were principally ♀'s, and their death was probably due to the insect fungus, *Entomophthora calopteni*, Bessey, an interesting account of which appeared in Bull. 22, U. S. Dept. Agr., 1890, 104. The disease was, perhaps, more abundant on account of the young being exposed to so much dampness in May and June. In two instances females of *Melanoplus differentialis*, Thomas, were discovered feeding upon the dead bodies of *C. viridis*, the abdomens and soft portions of the thorax having been wholly devoured.

CHLOEALTI^S CONSPERSA, Harris. (C. E., XXIII., 75.)

The ♂'s of this species are among the rarest locusts found in Indiana. Six years collecting have yielded me not more than as many perfect specimens. The ♀'s are by no means common, seldom more than four or five being seen in a day's collecting.

Mr. S. I. Smith* and Mr. S. H. Scudder† have each given an interesting account of the egg laying habits of the ♀ *conspersa*. On August 11th, 1893, I discovered a ♀ in the act of boring a hole in the upper edge of the topmost board of a six-plank fence. The abdomen was curved downward, and the forcipate valves of the ovipositor used as pinchers with which small pieces of the wood were broken off. When discovered, the abdomen was inserted nearly one-half an inch in the pine board, and the upper edge of the opening about the sides of abdomen was covered with small pieces of wood, just as the dust or borings will accumulate about the edge of a hole which a carpenter is boring.

I stood by and watched her work for ten or more minutes, when she suddenly stopped, withdrew her ovipositor and hopped away. Along the fence, within a distance of 30 feet, I found 15 other holes, 11 of which were fresh, while the others had evidently been bored the previous year. Most of these were on the upper edge of the top board, which was in all cases of pine and perfectly sound. None of the holes contained eggs, most of them being less than half-an-inch in depth.

On September 21st I found two ♀'s ovipositing in the sides of a rotten stump. Their abdomens were inserted their full length, and when removed eggs were found in the lower horizontal portion of each cavity.

CHLOEALTI^S CURTIPENNIS, Harris. (C. E., XXIII., 76.)

This has proved to be a very abundant species among the tall grasses of the low, damp prairies of Northern Indiana.

*Rep. Conn. Board of Agric., 1872, 375.

†"Distribution of Insects in New Hampshire," 371.

PEZOTETTIX GRACILIS, Bruner. (C. E., XXIII., 81.)

Mature specimens have been taken as early as June 25th. By July 4th it is common, especially upon the iron weeds (*Vernonia fasciculata*, Mich.) which grow abundantly in low, open woods. It has been found in copulation at this date and as late as November 10th, though whether there is more than one brood each season, I have not been able to ascertain.

(To be continued.)

A LEAF-TISSUE GALL ON MOUNTAIN COTTONWOOD.

BY C. H. TYLER TOWNSEND, KINGSTON, JAMAICA.

A fleshy leaf-tissue gall was found on terminal twigs of *Populus Monilifera* (?) June 18, 1892, a few miles to the north of Ojo Caliente, in Southern Socorro county, New Mexico. This gall is somewhat similar in method of formation to one that has been found on *Rhus microphylla*, which possesses a cock's-comb-like appearance.

Gall.—Diameter (after being thoroughly dried and much shrunken) of four galls: 15 by 12 mm.; 17 by 19 by 14 mm.; 20 by 14 mm.; 22 by 20 by 18 mm.; the length (extent on stem) being less than width. Gall rather irregular in outline, fleshy, growing more or less in irregular sections, clustered together around the twig, but springing from side stems, consisting of a mass of fleshy, abnormally developed and degraded leaf-tissue massed together. Colour, red on all surface exposed to the sun; the lower or inner surface next the centre of the tree, when not so exposed, but sheltered by the foliage, greenish. The irregularity of the external surface of the gall is due to the various groups of massed leaf-tissue being independently and unequally developed, with spaces between.

Four galls. Two cast skins were found on the surface of these. The skins appear to be hemipterous, possibly homopterous. The fleshy sections of tissue contain cavities within, but there is no trace of the gall maker.

ON SOME NORTH AMERICAN SPECIES OF CHIONOBAS.

BY DR. HERMAN STRECKER, READING, PA.

Last December Mr. H. J. Elwes gave a revision of the genus *Chionobas* in *Trans. Ent. Soc.*, London, to which Mr. W. H. Edwards, in the March number of the *CAN. ENT.*, gives "notes," or rather exceptions, in which he still contends that *Gigas*, *Californica* and *Iduna* are three distinct species, but now allows *Nevadensis*, which he formerly considered also to be distinct, to be a synonym of one of these, but does not know of which. Elwes has placed these four as one species, just as they are in the "Synonymical Catalogue" issued by me in 1878, nor can I understand how anyone can imagine there is more than one species under the four names; there is absolutely no point by which any of the examples can be separated, whether they come from California, Washington, Oregon or elsewhere; were they to be mixed indiscriminately, without locality labels, no one could say from whence came this or that example, or which was this or that so-called species.

With *Subhyalina* Elwes has followed our *Syn. Cat.* in the same way, with the single exception, an important one, that he has given the name *Subhyalina* priority over *Crambis*, which it really has by right of publication, if the two names belong to the same insect, but the doubt surrounding the former name, which I believe belongs to an *Erebia*, influenced me in placing Freyer's name first. The description of *Hipparchia Subhyalina* in appendix to Ross's 2nd Voyage, evidently fits *Erebia Fasciata*, or a variety of it, and, as Edwards suggests, the example in Oberthür's collection submitted to Elwes may not be the type, as certainly, if it is the same species as Bean took in N. W. Territory, it in no wise agrees with Curtis's description.

Ch. Alberta, which Edwards insists is *Varuna*, is a smaller form of *Chryxus*, of which I have good examples, ♂ ♀, received from Morrison a number of years since, who took them in Idaho; Elwes's types came from Calgary; he says in the collection of a Mr. Wolley-Dod, from whom he obtained them, were also examples of *Varuna*. At the same time I received from Morrison *Alberta* ♂ ♀; he also sent *Varuna*, ♂ ♀, taken at same locality. There is no difficulty in distinguishing these two, as *Varuna* is a variety or form of *Uhleri*, whilst *Alberta* occupies the same position towards *Chryxus*. *Varuna* I also have from Bean, in N. W. Ty., and from Morrison, from Arizona. I have *Uhleri*, from Colorado, not to be distinguished from *Varuna*, from Idaho and Arizona. The female of

Alberta, which was unknown to Elwes, differs, as is usual in the genus, from the male, in the wings, being broader and more rounded; the colour is same as ♂; the outer edge of mesial band on under side of secondaries is markedly defined, but the whole space from that edge to the base of the wing is heavily striated. Of *Chryxus* I have examples from Utah of the pale yellowish colour of *Nevadensis*, which, on the upper surface, they so wonderfully resemble as to be almost mistaken for medium-sized examples of that species. There are yet fairly strong grounds for Elwes's first impression that *Ivallda* was a variety of *Chryxus*, as the only apparent difference worth noting is that of colour, but there is too little of *Ivallda* known to form any certain conclusion.

From Morrison I also received a ♀ *Chionobas*, taken by him at Mt. Graham, Arizona. The easiest way to describe this would be to say it is the counterpart of *Ch. Fulla*, Ev., from the Tarbagatai, a species but little known in American collections; this closely-allied American species, which we might designate as *Ch. Daura*, expands nearly $1\frac{3}{4}$ inches, is whitish ochraceous, almost the colour of *Ivallda*, the primaries finely striated on costa, a broad, submarginal band scarcely a shade paler than the part interior to it, from which it is separated by a brown line produced in an angle at 2nd discoidal nervure, from whence it recedes inwardly at the costa; in this band are three small black spots, in cells 2, 3 and 5 the uppermost one largest and minutely pupilled with white. A gray marginal band. Fringe from anal angle half way brown, rest brown and whitish alternately. Inferiors have a broad, pale, submarginal band, on which, in cell 2, is a minute black dot or point. The mesial band defined by a dark shade at edges. A gray marginal band. Fringe whitish, with brown at termination of veins. Reverse surface paler than above. Secondaries almost white, markings of upper surface reproduced. Primaries towards exterior margin delicately striated, the spot in cell 3 wanting. Inferiors most daintily mottled, much finer than in its Asiatic analogue or in any other American species. A broad mesial band very distinctly defined and shaded with dark brown at its edges. Towards the margin of the wing a tendency in the mottling to segregation. Fringes on all wings as above. I have only seen this one ♀ example, and on one example it is not to be known whether this be identical with the Central Asiatic species compared with it (to my examples of which its resemblance is amazing), which is possible, but scarcely probable, or whether it be distinct, which, as far as the American species are concerned, it certainly is, is one of those problems the future must solve.

Ch. Brucei, W. H. Edw., I cannot separate from *Bore*, at least not from the examples of the latter I have from Dr. Staudinger, who, as an authority on the Palæarctic fauna, has no peer.

Ch. Beanii, Elwes, will easily be known always by its almost uniform dark smoky hue, and will hold its own; *Assimilis*, with which Edwards confounds it, being only a synonym of *Crambis*, Frey.

The true *Ch. Semidea* I have in numbers from Okkak, Labrador, and they differ in nothing from the Mt. Washington ones, as neither do several in my possession from Hudson Strait. Those from Colorado (which Edwards claims are *Oeno*) in some instances, especially in the females, have a slightly more ochrey shade, and the secondaries beneath are not so darkly coloured in the moss-like mottling, but these are entirely too slight grounds to sustain any claims to specific distinctness. I possess three distinct species from Labrador, viz., *Semidea*, *Crambis* and *Taygete*, and the two first are as easily separable from each other as from the last.

As to the value of the clasper depended upon by Mr. Elwes in associating species, I certainly have no "practical experience in the matter," having never given it much attention, hence can offer no opinion, though from what I have noted of other instances of sexual peculiarities they sometimes would unite species otherwise by no means close.

NOTES ON SOME OF THE NOCTUÆ IN THE BRITISH MUSEUM COLLECTION.

BY J. W. TUTT, F. E. S. (EDITOR OF "THE ENTOMOLOGIST'S RECORD"),
LONDON, ENGLAND.

Some remarks made by Mr. Grote in his "Note on *Acronycta cristifera*" lead me to support his contention that in the British Museum "types may have become misplaced." I am, of course, simply a specialist at European NOCTUÆ, and only such material from outside countries as helps my work (more especially with the British species) has any great interest for me, and only so far as this can any remarks that I make be considered of value.

In writing my *British Noctua and their Varieties*, I was obliged to refer continually to the British Museum material. The NOCTUÆ had then just been re-arranged by Mr. Butler, and it had been re-arranged in the very tip-top of museum methods. The great Zeller collection had been incorporated, Mr. Grote's collection ditto, and the result no one can imagine. I maintain that collections of this kind have an inherent value

in themselves, and that as soon as they are broken up no man can judge for a moment what the original possessor intended, whereas if we can only see the collection as a master left it, we can understand at a glance what he intended.

To illustrate my point. In lumping the various collections together the most ridiculous errors have been made, even with the commonest British species. We have a common British species, very common indeed within two or three miles of the British Museum, *Hadena thalassina*. This species every youngster here gets his first season. In the Museum collection, as arranged by Mr. Butler, it consists of eight *Hadena* (*Mamestra*) *thalassina*, two of *H. adusta* and four of *H. genistæ*; the last specimen of *N. margaritacea* is a typical *N. glareosa*; the two last specimens under the name of *N. punicea* are specimens of *N. umbrosa*. Four specimens of *Agrotis nigricans*, var. *carbonea*, are placed in the series of *A. tritici*. A very fine series of the grey type of *Agrotis* (*Pachnobia*) *hyperborea* is in the Museum under its true name, but the "types" of its red British variety, *carnica*, are placed right away in another drawer, mixed up with another species, *P. carnea*. Struck, apparently, by the similarity of the names—*carnea* and *carnica*—the two red specimens of a distinct species have been put into the series of another species which has no affinities with the first. So much for some of the errors of lumping, which I can vouch for.

Now, there is another little matter which should interest American entomologists, and which, I am sorry to say, puts Mr. Butler's inability to see even the most striking specific characters in a strange light. It refers to *Leucania* (*Heliophila*) *pallens* and *L. straminea*. Mr. Butler writes: "*L. pallens*, of the United States, agrees absolutely with the European *L. straminea*. The two forms have practically the same characters, and, if received from any extra European locality, would never have been considered distinct; indeed, it is possible to find examples which cannot with certainty be referred to one form rather than the other. *L. straminea* differs chiefly in the generally more prominent pale longitudinal streak above the median vein of the primaries, and the better-defined black or dark markings. Not having bred both from the egg, I have kept them separate in the collection." (Trans. Ent. Soc., London, 1890, pp. 660-661). A reference to the British Museum material, on which the remark was based, shows that they have *not* been kept separate, and of a whole row thus named by Butler, only seven specimens are *straminea*, and not one

of these came from America. The two species are much more distinct than *Vanessa cardui* and *V. Atalanta*, and I cannot imagine even the veriest tyro, if a field naturalist, considering them identical, and still less do I follow that the only reason for making them separate is that they do not "come from extra European localities" (what a condition the extra-European species in the British Museum cabinets, as recently re-arranged, must be in, if named on these lines, I must leave the "extra-European" naturalists to imagine!) whilst it is to be noted that the only differences which Mr. Butler sees are "the generally more prominent pale longitudinal streak above the median vein of the primaries" and "the better-defined black markings," when, as a matter of fact, it is difficult to find a point of similarity,—the thoracic crest in *straminea*, the differently shaped wings, the sexual variation in the hind wings, development of the pale nervures, etc., all pointing to complete distinctness, and all this muddle about two species which swarm on the Thames' marshes in the south-east district of London, only a few miles, as the crow flies, from the British Museum, and which have different larvæ feeding at different times in different ways on different food-plants.

I cannot say how extremely sorry I was to find this condition of affairs in our National Museum, but it is a most serious matter, and the condition of the collections in the British Museum is a matter for the consideration of scientific men all over the world.

Two things I would ask American entomologists to do. (1) To take nothing published on the NOCTUÆ in the British Museum for granted, and to be sure to verify each individual statement. (2) To insist, in season and out of season, that collections left by eminent men shall be left intact, so that specialists may form their own conclusions. The lumping process, which results in the production of such a condition of affairs as I have pointed out at length in the Introduction to Vol. IV. of my *British Noctuae and their Varieties*, is a matter for the consideration of every scientific man.

THE COLEOPTERA OF CANADA.

BY H. F. WICKHAM, IOWA CITY, IOWA.

III. THE MELOLONTHINE SCARABÆIDÆ OF ONTARIO AND QUEBEC.

The members of this group are distinguished, as already stated, by the position of the abdominal spiracles, which are placed in part on the superior portion of the ventral segments, the rows feebly diverging; the last spiracle usually visible behind the elytra. Secondary sexual characters are displayed often in the antennæ, the club being longer in the males; the legs and ventral segments also often give us a clue to the sex of the specimen, as will be shown in the proper place. The following partially artificial key will enable the genera to be properly identified so far as the recorded species are concerned.

- A. Middle and hind tibiæ with only one spur, which is sometimes obsolete.
 No onychium, body scaly..... *Hoplia*.
- AA. Middle and hind tibiæ with two spurs, onychium well developed.
- b. Form elongate, slender; colours metallic green or bronze (at least in part) or yellow.
 Elytra not densely scaly; claws chelate..... *Dichelonycha*.
 Elytra densely covered with ochreous scales; claws not chelate
 *Macroductylus*.
- bb. Form robust, heavy; colour brownish, sometimes iridescent, pubescent, or somewhat irrorated.
- c. Ventral segments five. Elytra either uniformly rather finely punctured or with punctured striæ..... *Diplotaxis*.
- cc. Ventral segments six.
- d. Elytra with rather indistinct but regular sulci or grooves on the disk. Size small..... *Serica*.
- dd. Elytra without striæ or sulcations over the greater portion of the disk. Size larger.
 Antennæ with the third joint not elongate, the club three-jointed..... *Lachnosterna*.
 Antennæ with the third joint greatly elongate, the club three-jointed..... *Polyphylla*.

In using the above table care must be taken to count *all* of the ventral segments—the first or last is in danger sometimes of being overlooked. A reference to the specific characters, as given in the following synopsis, however, will aid inexperienced workers in clearing up possible doubts.

It is perhaps unnecessary to mention that a fairly good lens should always be at hand to aid the eye in discriminating the more difficult species.

HOPLIA, Ill.

These are oblong insects, more or less flattened above, and covered either entirely or in part with scales, ordinarily yellowish, brownish, greenish or of metallic lustre. The claws are chelate. The two sexes often differ in size and colour, and the males have thicker hind tibiae and tarsi. They are found on flowers during the day. Following the scheme of Dr. Leconte, the Canadian species may be thus distinguished:

A. Claws of hind tarsi not cleft.

Prothorax wide, narrowed in front, sides subangulate and rounded.

Sexes dissimilar in colour; the ♂ black, hairy, with cinereous pubescence, sprinkled beneath with silvery scales; ♀ brown, very densely clothed with pale brown and yellowish silvery scales.....*trifasciata*, Say.

Prothorax wider in front of the base, sides strongly angulated.

Sexes similar, clothed with oval ochreous scales...*mucorea*, Germ.

AA. Claws of hind tarsi cleft near the tip; sides of prothorax broadly rounded, front and middle tarsi with two claws.*modesta*, Hald.

The *Hoplia tristis* of the Society list is the male of *trifasciata* according to Dr. Leconte.

DICHELONYCHA, Kirby.

Elongate beetles, usually piceous or testaceous in colour, often with a distinct green or bronze lustre, found on young shoots or the leaves of trees. The claws are chelate (*i.e.*, capable of being folded along the tarsi). The male has the club of the antenna nearly as long as the funiculus, and the outline of the middle line of the abdomen is concave when viewed in profile. The table as given below will assist in identification:

A. Thorax without median groove, but sometimes with a line.

b. Legs almost entirely black.....*Backii*, Kirby.

bb. Front and middle legs testaceous, tip of hind tibiae and the hind tarsi piceous.....*elongata*, Fab.

bbb. Legs entirely testaceous.

c. Anterior tibiae with the upper tooth obsolete, *Canadensis*, Horn.

cc. Anterior tibiae tridentate.

Median line of thorax faint, punctures

coarser*subvittata*, Lec.

Median line of thorax wanting, punctures

finer.....*testacea*, Kirby.

AA. Thorax with deep median groove, disk punctured in an even space
each side.....*albicollis*, Burm.

MACRODACTYLUS, Latr.

The "Rose-bug," *M. subspinosus* (Fig. 25), is the only recorded Canadian species of this genus, and is probably too well known to need an extended description. It is an elongate insect (about .35 inch) with very long and slender legs, the body covered with ochreous scales to the extent of obscuring the real colour. The thorax is very long and angulate on the sides.



Fig. 25.

SERICA, MacLeay.

Two species are recorded from East Canada. They are robust convex insects of rather small size (.35 to .42 inch), broader behind, giving them a very characteristic appearance. The species fly chiefly in the evening, and during the day may be found under leaves in the woods. They are easily separated thus:

Body not iridescent, clypeus with a small acute incisure each
side.....*vespertina*, Gyll.

Body iridescent, clypeus without incisure.....*sericea*, Ill.

DIPLOTAXIS, Kirby.

These beetles are easily known from *Serica*, to which they bear some resemblance, by the elytra not being sulcate, but either simply punctate or with the punctures arranged in rows, the rows in pairs. The wider interspaces are irregularly punctured; the body is less convex and less dilated posteriorly than in *Serica*. The species of the region under consideration may thus be known:

A. Body pubescent, elytra without distinct rows of punctures..*sordida*, Say.

AA. Body not pubescent above, elytra distinctly punctate-striate.

Thorax with scattered punctures, leaving smooth spaces near the
middle.....*liberta*, Germ.

Thorax densely and more finely punctured.....*tristis*, Kirby.

LACHNOSTERNA, Hope.

This genus, formerly in confusion in all cabinets, has lately had the attention of Dr. Horn, who has developed characters that may be

used with profit in synoptic tables, and thus rendered the task of identification much less difficult, though from the extent of the group there is necessarily still trouble in certain portions of the series. In the following table I have used chiefly the points first recognized as important either by him or by Dr. Leconte, but by a somewhat different, if more artificial, sequence, am able to do away with the necessity of using the fixity or freedom of tibial spurs of the male as a prime character, this being somewhat difficult for a beginner to demonstrate without softening the specimen. The ventral ridge referred to as separating the forms of the *fusca* group is to be found near the hind margin of the ventral segment immediately preceding the last.

Though the species of *Lachnosterna* are ordinarily easily separated from those of any other Eastern American genera by their facies (Fig. 20, page 197, *Lachnosterna fusca*) their extreme similarity amongst themselves is such as to practically debar the formation of a table based on easily seen characters, and the females must usually be associated with their appropriate males by comparison. They have been almost entirely left out of account in the second division (AA) of the accompanying table :

- A. Body above conspicuously hairy or pubescent.
- b. Antennæ 9-jointed; body above sparsely clothed with erect hairs..... *hirsuta*, Knoch.
- bb. Antennæ 10-jointed.
- Elytra with series of erect hairs arranged in vitta..... *hirticula*, Knoch.
- Elytra with sparse short pubescence, longer at base..... *tristis*, Fabr.
- Elytra pruinose; pubescence uniform, recumbent. *ilicis*, Knoch.
- AA. Body without conspicuous hairs or pubescence above.
- c. Inner spur of hind tibiæ ♂ very short, the outer long and slender..... *ephilida*, Say.
- cc. Inner spur of hind tibiæ ♂ at least moderately long (usually half as long as the other or more).
- d. Yellowish-testaceous, form slender, subcylindrical, size small (.41 to .52 inch.)..... *gracilis*, Burm.
- dd. Colour darker, form more robust, never notably slender, size larger.



Fig. 26.

- e. Inner spur of ♂ hind tibiæ arcuate and angularly bent at tip, somewhat sigmoid in form (see fig. 26).....*gibbosa*, Burm.
 ee. Inner spur of ♂ hind tibiæ at most slightly curved.
 f. Antennæ 9-jointed.

g. Sutural stria well impressed, the costa of normal convexity.

Form oblong-oval, last ventral of ♂ convex, sometimes with a median channel.....*implicita*, Horn.

Form elongate, last ventral c broadly concave with longitudinal median impression.....*villifrons*, Lec.

gg. Sutural stria indistinct, costa scarcely elevated.....*limula*, Horn.

ff. Antennæ 10-jointed.

h. Clypeus moderately closely punctate only, the sides of the thorax entire, disk never very coarsely punctate.

Ventral ridge of ♂ long, arcuate, overhanging for its full length behind.....*dubia*, Smith.

Ventral ridge of ♂ longer, slightly curved, the ends only overhanging behind... ..*fusca*, Fröh.

Ventral ridge of ♂ nearly straight, not overhanging behind.....
*grandis*, Smith.

hh. Clypeus densely punctate.

- i. Thorax broadest at base, margin entire or slightly crenate, disk variably punctured.

Last ventral of ♂ vaguely longitudinally impressed
*marginalis*, Lec.

Last ventral of ♂ with cupuliform fovea. *fraterna*, Harr.

- ii. Thorax widest at middle, margin distinctly crenate, disk coarsely punctate.

Punctures of thorax regularly placed. . . *profunda*, Blanch.

Punctures of thorax irregularly placed, the median line and often lateral spaces smooth
..... *rugosa*, Mels.

Of the species above given, *grandis* is reported (in Canada) only from Nova Scotia, and *limula* from "south of Hudson's Bay." A few of the others are simply recorded from "Canada" without more definite locality; but as they occur in the adjacent United States, they are in all probability to be met with in the provinces under consideration. The *cognata* of the Society's list is simply a variety of *fraterna*, in which the thoracic punctures are equal in size and the margin irregular; *subtonsa* is a synonymy of *ilicis*, according to Dr. Horn.

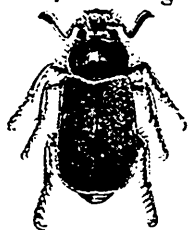


Fig. 27.

POLYPHYLLA, HARR.

The only form found in East Canada is *P. variolosa*, Hentz (Fig. 27), a very fine, large insect, nearly or quite an inch in length. The form is something like that of *Lachnosterna*, but the upper surface is marked with three white vittae on the thorax and indistinct lines and spots on the elytra, of whitish scales. The antenna of the ♂ is furnished with a very long club.

OBITUARY.

Died, in New York City, 21st April, 1894, Mrs. Julia Perkins Ballard, wife of Prof. Addison Ballard, now of New York University, but for many years of Lehigh University. It was at Easton, Pa., that Mrs. Ballard became interested in entomology, and her personal experiences were published in the little volume, "Insect Lives, or Born in Prison," later revised and much enlarged, under the name of "Among the Moths and Butterflies," Putnams, 1890. Mrs. Ballard was enthusiastic in her studies, and her charming books have done much to foster a love of natural history among the young people.

W. H. E.

NEW CYNIPIDÆ.

BY C. P. GILLETTE, FORT COLLINS, COLORADO.

(Continued from page 159.)

CYNIPS, Linn.

C. washingtonensis, n. sp.

Galls of this species were sent me by Mr. Trevor Kincaid, of Olympia, Washington, who writes that they were collected from the twigs of *Quercus garryana*. The galls are ellipsoids, from 5 to 7 mm. in greatest diameter; they are smooth, monothalamous and snuff coloured, both externally and internally, and are attached by a small projection to the side of small twigs. A few specimens that appear not to be mature are greenish in colour, and have shrivelled somewhat on drying, so that the surface is covered with small, shrunken areas. The substance of the gall is uniformly and densely cellular. Described from 13 galls.

Gall-fly.—General colour a dark brown, inclined to black. *Head* small, blackish in colour, tinged with rufous; antennæ of the same colour as the head, 14-jointed, 3rd joint once and a-half as long as the 4th. *Thorax* finely rugose and rather coarsely punctured, parapsidal and median grooves distinct near the scutellum, the former extending half way to the collar, the latter less than half way. The two parallel lines extending back from the collar and the lines over the bases of the wings are the blackest parts of the mesothorax. Scutellum rugose, foveæ scarcely discernable; pleuræ finely punctured, the punctures giving rise to hairs; colour of pleuræ rufous. *Abdomen*, except a large patch on the dorsum of the 2nd segment and a narrow line over the succeeding segments, densely set with silky pubescence, the hairs rising from minute punctures. *Wings* hyaline, 5 mm. long, nervures slender, radial area long and narrow. *Feet* of a light chestnut colour, the tarsi being darkest, densely set with a fine pubescence. Length, 4 mm.

Described from one bred female.

ANDRICUS, Hartig.

A. spongiola, n. sp.

Galls of this species were also sent me by Mr. Kincaid, who writes that he took them from limbs of *Q. garryana*. They are polythalamous, globular, buff-coloured galls measuring from 3 to 5½ cm. in diameter; some of the galls are tinged with salmon. The galls grow in clusters on the limbs, and are in some cases much pressed out of shape. Perfectly

shaped galls resemble the galls of *Amphibolips spongifica*. Internally the galls are composed of an exceedingly brittle, structureless material, of a whitish or buffy-white colour that, to all appearances, shrinks away as the gall dries, so that there are large open spaces internally. Near the point of attachment on the inside of the gall is more or less of a resinous substance. The portion containing the larval cells, which are few in number, sometimes only one, is more dense, almost woody, in structure. The substance of these galls cuts about like a perfectly dry cracker.

This gall is separated readily from Mr. Bassett's *A. californicus* by the much less dense internal structure, in which are large open spaces.

Gall-flies.—The flies are of a very uniform walnut-brown colour throughout. So far as I can see, this colour alone separates the species from Bassett's *californicus*, which is very much lighter, a good cinnamon-brown. (These colours are given in accordance with Ridgway's Nomenclature of colours.) *Head*: Face finely rugose, more coarsely so near the mouth; vertex, genæ and occiput very finely rugose or granular in appearance, face rather closely set with very fine pubescence, occiput black, antennæ 15-jointed, 3rd joint $1\frac{1}{2}$ times as long as the 4th, joints beyond the 4th gradually shorter, last 7 or 8 joints quite short and thicker than the preceding. *Thorax* very finely rugose and covered with pilose punctures, parapsidal grooves narrow and extending about half-way to the collar, median groove wanting; a slight groove on either side runs forward over the base of the wings; the two parallel lines from the collar are very distinct and extend fully half-way to the scutellum. Scutellum with two small foveæ fluted at the bottom, finely rugose, covered with a fine pubescence; pleuræ finely punctured and hairy. *Abdomen* polished, sides of 2nd segment near its base hairy, all the segments very minutely punctured. *Wings* slightly smoky, venation normal. *Feet* unicolorous with other parts, tarsal claws bidentate.

Length, 5 mm. Wings, 6 mm.

Described from 15 bred females. Galls were received August 26th, and the flies emerged between the 3rd and 22nd of November.

HOLCASPIS, Mayr.

H. maculipennis, n. sp.

The fragments of a globular leaf gall, about $1\frac{1}{2}$ cm. in diameter, composed of a thin outer shell and a single larval cell held in place by radiating fibres, was sent me some time since by Prof. T. D. A. Cockerell,

who writes me that the gall was taken on the west slope of the Organ Mountains, in N. M., from a leaf of *Q. wrightii*.

Gall-fly.—A single female fly, in perfect condition, accompanied the gall, and may be described as follows :

Colour, rufous and black. *Head*, genæ, orbits, vertex and bases of mandibles rufous ; middle of face, occiput and tips of mandibles black ; face finely rugose, punctured and sparsely haired, the hairs rising from the punctures ; vertex and genæ more finely rugose or granular in appearance, palpi yellowish, antennæ rufous, 14-jointed, 3rd joint and last three joints blackish, 3rd joint distinctly longer than the 4th. *Thorax*: Prothorax rufous and finely rugose, mesothorax above blackish, streaked with rufous along the parapsidal grooves and along the lateral margins over the bases of the wings, otherwise black. The surface is finely rugose and set with punctures, moderately hairy, parapsidal grooves entire and very distinct, but not broad, median groove absent, the polished parallel lines extending back from the collar, and those outside the parapsidal grooves over the bases of the wings conspicuous ; scutellum rugose, rufous, except at base, where it is black, with shining basal groove crossed by numerous raised lines ; mesopleuræ rufous above and below, but black on median portion, punctured and moderately hairy. *Abdomen* black and shining, venter somewhat rufous, posterior margin of segments very oblique, sides of 2nd segment near base hairy. *Wings* long, nervures black, cells containing numerous black spots. This beautiful maculation of the wings, unlike any other species with which I am familiar, suggested the specific name for the species. *Feet* dark rufous, femora blackish, rather hairy.

Length, 3 mm. Wings, 4 mm.

DRYOPHANTA, Först.

D. glabra, n. sp.

Galls of this species were found abundant by the writer on leaves of *Quercus undulata* at Manitou, Colo., Sep. 30th, 1892. The fresh galls are straw-coloured, becoming brown with exposure. They are semi-globular, flattened on the side next the leaf, from 4 to 6 mm. in diameter, and situated along the midrib of a leaf, on either surface, but mostly below. A single larval cell in each lies next the leaf, and from it a mass of delicate fibres radiate to the outer shell, which is rather firm. The inner surface of this shell, in galls that have been protected from the weather, is of a deep pink colour. A number of the galls usually occur on the same leaf, and sometimes crowd one another, so they are far from globular.

Gall-fly.—With the exception of a little rufous on the joints of the feet and on the base of the mandibles, the colour is deep black. *Head* finely rugose, face with two parallel grooves and median ridge, antennæ 14-jointed, 3rd joint as long as 1st and 2nd or 4th and 5th united; ocelli well separated and inconspicuous. *Thorax* glabrous above, parapsidal grooves very distinct and extending to the collar, scutellum rugose, with basal groove, mesopleuræ smooth and glabrous beneath the wings. *Abdomen* shining, black, without sculpturing, the posterior margin of the 2nd segment quite oblique. *Wings* long, hyaline, beautifully iridescent, nervures slender. *Feet* black, tibiæ set with a very fine gray pile. Length, $2\frac{1}{2}$ mm. Wings, 4 mm.

Described from one bred female.

(To be continued.)

CORRESPONDENCE.

LITHOPHANE ORIUNDA.

Sir,—Two localities may be mentioned additional to those given by Mr. Moffat in July (1893) number.

Mr. Grote has recorded Wisconsin as a habitat of *Oriunda*, and I can say that a single specimen was collected at Galena, Illinois, Sept. 26, 1875, from a sugared tree. THOMAS E. BEAN, Laggan, Alberta.

Sir,—I wish, on behalf of the Entomological Society of Ontario, to acknowledge the receipt of a contribution to the Society's collection of native Coleoptera, from Mr. A. H. Kilman, of Ridgeway. It consists of over a hundred and fifty species that were wanting in the Society's cabinets, all nicely mounted and in fine condition.

London, May 16th, 1894.

J. ALSTON MOFFAT, Curator.

IS CÆNONYMPHA TYPHON SYNONYMOUS WITH C. INORNATA?

Sir,—Will American entomologists who are acquainted with the European forms of *Cænonympha typhon*, especially with vars. *laidion*, Bork, and *isis*, Tett (probably identical), inform me whether *Cænonympha inornata*, Edw., is a distinct species or is identical with these varieties? From the descriptions, I incline to the latter view, but an inspection of some specimens of the American insect in the British Museum (Natural History), not very first-rate ones by the way, rather lends countenance to the former.

F. I. BUCKELL, M. B., 32 Canonbury Square,
London N., England.

GLASS TUBES AS INCUBATORS.

Sir,—On June the 24th, 1893, I was obliged to go to my home in the High Sierras and beyond the Yosemite 22½ miles, as I had some moth eggs that I wanted to hatch and rear larvæ from. Before going I placed all the leaves that had eggs on them in a small glass jelly jar; being three days getting there, on account of the deep snow, I kept putting in fresh leaves every day for the young larvæ to feed on, as the eggs had begun to hatch before I started, and when I got home I had more dried and withered leaves than I bargained for, and in consequence lost some of the smaller larvæ that had hidden themselves. To prevent a recurrence of such loss, I thought of some glass tubes that were sent to me by Prof. Riley. I then separated all the leaves that had eggs on them, cut away all the superfluous dry parts of the leaf, and placed them all in one of these tubes, introducing a fresh leaf or part of one until a newly hatched larva made its appearance; I would then draw him out with the leaf and place him in another tube, or on a potted plant, thus ensuring correct data and better chances of observing its natural life-habits. This also ensures safety to both eggs and the young larvæ, as new food can be introduced and the old extracted without annoying the larvæ.

JOHN B. LEMBERT, Yosemite, Cal.

THE ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.

The Association of Economic Entomologists will hold its annual meeting this year in Brooklyn, N. Y., August 14th and 15th, dates immediately preceding the meeting of the American Association for the Advancement of Science.

The fact that the meeting is to be held in Brooklyn is a sufficient guarantee of a large attendance and a meeting of more than usual interest. It is sincerely hoped that every member who can will be present, with papers to read, questions to ask and ideas to impart, that will make the meeting profitable and send all back to their posts of duty inspired to better work.

C. P. GILLETTE, Sec'y., Fort Collins, Colo.

ASSEMBLING OF ATTACUS PROMETHEA.

Sir,—About 3 o'clock p.m., on the 11th of June, whilst hunting along the east side of a high picket fence, running north and south, with woods on the west, and a field on the east, my attention was arrested by the unusual movements of what I thought was a black butterfly. It was fluttering up and down the tall pickets, passing through between them and returning again, in a state of evident excitement. It left off, and flew close by me, when I saw that it was a male *promethea*. Meanwhile another had taken its place, and was going through similar movements. I at once inferred that a female must be in that vicinity. I moved onward, looking between the pickets, and I saw a female suspended to the lower end of a cocoon, out of which she had probably emerged that day. The cocoon was attached to the end of a slender twig, 12 or 14 inches from the fence, and about 4 feet from the ground.

I remained close by and watched the movements. There were at least four males on the wing. They would fly 20 or 30 feet along the fence, either way, and return. They never flew far afield, and I did not see that they ever entered the woods, whilst one or other of them was always fluttering about the spot, regardless of my presence. They seemed to tire themselves out in a main effort to locate the object of their search. I had watched for about fifteen minutes, when one came quietly along, passed between the pickets, fluttered hither and thither for an instant, then I saw its mate was found. During my observation the female was perfectly quiescent; not a movement of wing or foot. There were three males still on the wing when I left.

Are we to consider *A. promethea* a day flyer? or are all the *Suturniidae* ready to pair at any hour of the twenty-four when circumstances are favourable? It seems they do not require to fly at all to feed. The female may oviposit during the night.

I was greatly impressed during the observation by noticing how little, if at all, eye-sight was made use of.

J. ALSTON MOFFAT.

Mailed August 1st.