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No. 12

## NOTES ON THE LOCUSTIDÆ OF ONTARIO.

BY E. M. WALKER, B. A., M. B., TORONTO.

(Continued from page 330.)

Sub-family *CONOCEPHALINÆ*.

7. *CONOCEPHALUS ENSIGER*, Harris. The Sword-bearer.

*Conocephalus ensiger*, Harr. Ins. Inj. Veg., 1862; 163.

Measurements: Length of body, ♂ 26.5 mm., ♀ 29 mm.; of pronotum, ♂ 7.5 mm.; ♀ 6.7 mm.; of hind femora, ♂ 20.5 mm., ♀ 21.5 mm.; of tegmina, ♂ 41 mm., ♀ 46 mm.; of ovipositor, 32 mm.

This is a very common insect in Ontario, ranging northward about as far as Muskoka and the Bruce Peninsula. It frequents fields, vacant lots and roadsides, which resound at night with the incessant monotonous song, during late summer and autumn.

Scudder describes this song as composed of a succession of sounds like "chwi," emitted at the rate of about five per second. He states that it stridulates only at night or during cloudy weather, but I have occasionally heard it in bright sunshine, in the afternoon. It is the most easily approached of all our locustarians while thus engaged, and is in fact difficult to find in any other way; hence the females are but seldom seen.

Although this grasshopper usually perches upon tall weeds, I have occasionally traced its song to a tree or vine, the insect being sometimes stationed at a considerable height.

I have taken but one brown individual, a female captured at Toronto, Oct. 1, 1893.

Localities: Rondeau, Kent Co., Sept. 14, 1899; Leamington, Aug. 7, 1901; Sarnia, Aug. 16, 1901; Goderich, Aug. 19, 1901; Burke Id., Lake Huron, Aug. 27, 1901; Niagara River, Sept. 26, 1898; Toronto, Aug.-Nov.; Lake Simcoe, Aug.-Sept.; Bracebridge, Muskoka (heard), Sept. 11, 1900.

8. *CONOCEPHALUS NEBRASCENSIS*, Bruner. The Nebraska Cone-head.

*Conocephalus nebrascensis*, Bruner, CAN. ENT., XXIII., 1891, 72.

Measurements of ♂: Length of body, 25 mm.; of pronotum, 6.7 mm.; of hind femora, 19 mm.; of tegmina, 34 mm.

I found four males of this species at Sarnia, on the 12th of August, 1901, by tracing the song to its source. The song was a loud, penetrating, continuous whirr, quite suggestive of the dog-day Cicada, but less clear, and very unlike that of *ensiger*. It was heard in the morning during bright sunlight.

The specimens were taken in a large stretch of open grassy marsh land, bordering the St. Clair River. Earlier in the season this area of land had been entirely covered by water, but the ground was dry when I visited the spot.

9. *XIPHIDIUM FASCIATUM*, De Geer. The Slender Meadow Grasshopper.

*Locusta fasciata*, De G., Mem. pour serv. à l'hist. des ins., III., 1778, 458.

*Xiphidium fasciatum*, Burm., Handb. der Ent., II., 1839, 708.

Measurements: Length of body, ♂ ♀ 12.5 mm.; of pronotum, ♂ 2.75 mm.; ♀ 2.8 mm.; of hind femora, ♂ 11 mm., ♀ 11.5 mm.; of tegmina, ♂ 14 mm., ♀ 15 mm.; of ovipositor, 8.4 mm.

This is much the most abundant locustid found in Ontario, and is common in every part where I have made collections of Orthoptera. It is especially numerous in low damp pastures, timothy and clover meadows.

My earliest captures are dated July 25th, but the imagoes usually appear rather before this. They remain until the beginning of October.

The song of the male is somewhat like a faint echo of that of *Orchelimum vulgare*, but the "zip" is emitted only once or twice at a time, and at shorter intervals, "xr..... zip, zip, xr....."

*Fasciatum* is one of the few common locustids in northern Ontario. It is as abundant at North Bay, Lake Nipissing, as at Point Pelee, and south of the boundary line its range extends to Buenos Ayres, S. A.

Localities: Ottawa; Ont., generally to north of Lake Superior (Caulf.); Point Pelee and Leamington, Aug. 8, 1901; Arner, Essex Co., Aug. 9, 1901; Rondeau, Sept. 14, 1899; Chatham, Aug. 10, 1901; Sarnia, Aug. 12, 14, 1901; Walpole Id., River St. Clair, Aug. 13, 1901; Goderich, Aug. 19, 1901; Southampton, Aug. 22, 29, 1901; Bruce Peninsula, Aug. 23, 27, 1901; Toronto, Aug.-Oct.; Lake Simcoe, July 26-Oct.; Severn River, Aug. 17, 1898; near Gravenhurst, Aug. 27, 1899; Agouquin Park, Aug., Sept., 1902, '03; North Bay, Sept. 12, 1900; Whittemouth, north shore of Lake Superior, Aug. 28, 1897.

Outside of Ontario I have taken this species at Quebec and the Isle d'Orleans, P. Q.; Aug., Sept., 1904; Boissevain, Man., Sept. 24, 1897; and at Agassiz, B. C., Sept. 9, 1897.

10. XIPHIDIUM BREVIPENNE, Scudd. The Short-winged Meadow Grasshopper.

*Xiphidium brevipenne*, Scudd., Can. Nat., VII., 1862, 285.

Measurements: Length of body, ♂ 12 mm., ♀ 13 mm.; of pronotum, ♂ 2.75 mm., ♀ 3.25 mm.; of hind femora, ♂ 10.3 mm., ♀ 11.7 mm.; of ovipositor, 9.75 mm.

This is another abundant species in Ontario, and is found in the same places as *X. fasciatum*.

It first reaches maturity about the first week in August, and remains well into October.

Although nearly as common as *X. fasciatum* in southern Ontario, *brevipenne* becomes scarcer to the north of Muskoka. It was not very common in Algonquin Park, where it seems to prefer the vicinity of rank herbs and bushes in more or less shady spots; while at North Bay I did not come across it at all. It was also quite rare on the Bruce Peninsula. On the other hand, I found it very abundant on the Isle of Orleans and surrounding parts of the Province of Quebec, *fasciatum* being comparatively scarce there.

The note of the male is very like that of *fasciatum*. The zips are emitted at intervals of about one second, one or two being produced at a time.

I have a long-winged female of a *Xiphidium* taken at Rondeau, Sept. 15, 1899, which possibly belongs to this species. It is considerably larger than typical *fasciatum*, with a distinctly longer ovipositor. In the length and shape of the ovipositor, it is very like *ensiferum*, but the head and pronotum are narrower than in that species. It measures as follows: Length of body, 15 mm.; of pronotum, 3 mm.; of hind femora, 13 mm.; of tegmina, 8 mm.; of ovipositor, 12.3 mm.

Localities: Arner, Essex Co., Aug. 9, 1901; Rondeau, Sept. 14, 1899; Sarafia, Aug. 12, 1901; Walpole Id., River St. Clair, Aug. 13, 1901; Goderich, Aug. 19, 1901; Southampton, Aug. 22, 1901; Tobermory, Bruce Co., Aug. 26, 1901 (one seen); Burke Id., Lake Huron, Aug. 27, 1901; Owen Sound, Aug. 31, 1901; Toronto, Aug. 4-Oct.; Lake Simcoe, Aug. 5 to Oct.; Severn River, Aug. 17, 1898. Six-mile Lake, Muskoka, Aug. 24, 1898; Dwight, Northern Muskoka, Sept. 2, 1902; Algonquin Park, Aug., '02, '03.

## 11. XIPHIDIUM SALTANS, Scudd.

*Xiphidium saltans*, Scudd., Rep. U. S. Geol. Surv., Nebr., 1871, 249.

*Xiphidium modestum*, Brun., CAN. ENT., XXIII., 1891, 56.

Measurements: Length of body, ♂ 11 mm.; ♀ 12 mm.; of pronotum, ♂ 2.8 mm., ♀ 3 mm.; of hind femora, ♂ ♀ 10 mm.; of tegmina (short-winged form), ♂ 4 mm.; ♀ 2.4 mm.; of ovipositor, 10.6 mm. Long-winged form: Length of tegmina, ♂ 14 mm.; ♀ 14.6 mm.; of wings, ♂ 16.2 mm., ♀ 17 mm.

I have found this western species in but one locality, High Park, Toronto, where it occurs locally in considerable numbers in the open grassy uplands, on sandy soil. These sandy uplands are of a very interesting character, and support a number of unusual plants and insects. Among the latter, *Melanoplus Dawsoni*, another western grasshopper, is found in the same spots as *X. saltans*. Both of these species are characteristic of the Western prairies, the general range of *saltans*, as given in Scudder's "Catalogue of the Orthoptera of the United States and Canada," being from the Rocky Mts. to the Mississippi River. It is found in the western part of Indiana, and has been reported from New Jersey (Smith, Ins N. J., 1900, 162).

*X. saltans* is most plentiful in tufts of rather long grass. New Jersey Tea, Sweet-fern and Lupine are among the characteristic plants of the locality.

My specimens are all peculiar in their coloration, being of a pale, almost bluish green, instead of dull reddish brown, the usual colour according to the descriptions. The dark stripe on the top of the head and pronotum is margined on either side by a very distinct and rather broad yellowish line.

A pair of this species was submitted to Prof. Morse, and another to Prof. Blatchley, both of whom agree in confirming my determination.

On the 9th of August, 1903, I captured a pair of long-winged individuals. These are the first that have been taken. They were found in company with short-winged examples, and are recognizable as *saltans* at a glance from the small size, peculiar coloration and long ovipositor in the female.

My specimens are dated Aug. 9, 10, 1902, and Aug. 9, Sept. 8, 20, 1903.

12. *XIPHIDIUM NIGROPLEURA*, Bruner. The Black-sided Meadow Grasshopper.

*Xiphidium nigropleurum*, Brun., CAN. ENT., XXIII., 1891, 58.

*Xiphidium nigropleura*, Scudd., CAN. ENT., XXX., 1898, 184.

Measurements: Length of body, ♂ 19.3 mm., ♀ 14.6 mm.; of pronotum, ♂ 3.3 mm., ♀ 3.5 mm.; of hind femora, ♂ 13 mm., ♀ 13.8 mm.; of ovipositor, 17.5 mm.

I have come across this handsome species in small numbers in southern Ontario, where it frequents open marshes bordering creeks and ponds, and grown up with tall grasses, sedge, etc. It was generally found in company with the next species. But a single male was taken.

Localities: Rondeau, Sept. 14, 1899; Arner, Aug. 9, 1901; Chatham, Aug. 10, 1901; Walpole Id., River St. Clair, Aug. 13, 1901.

13. *XIPHIDIUM ATTENUATUM*, Scudd. The Lance-tailed Meadow Grasshopper.

*Xiphidium attenuatum*, Scudd., Trans. Amer. Ent. Soc., II., 1869, 305.

*Xiphidium Scudderi*, Bl., CAN. ENT., XXIV., 1892, 26.

Measurements: Length of body, ♂ 12 mm., ♀ 14 mm.; of pronotum, ♂ 2.6 mm., ♀ 2.9 mm.; of hind femora, ♂ 11 mm., ♀ 14.2 mm.; of tegmina, short-winged form, ♂ 9.5 mm., ♀ 8.5 mm.; long-winged form, ♂ 16.5 mm.; ♀ 19 mm.; of ovipositor, 20-30 mm.

This extraordinary insect is plentiful in southern Ontario, but is quite limited in distribution.

The females are easily known by the enormous development of the ovipositor.

It frequents open marshy borders of creeks and ponds, where it leaps about with wonderful agility among the tall grasses and sedge. The short-winged form is much more often seen than the long.

Blatchley says: "The eggs of *attenuatum*, as the length of the ovipositor indicates, are laid between the stems and leaves of tall rank grasses, among which the insects live."

Localities: Rondeau, Sept. 15, 1899; Point Pelee, Aug. 8, 1901; Walpole Id., River St. Clair, Aug. 13, 1901.

(To be continued.)

## A REVIEW OF OUR GEOMETRID CLASSIFICATION—No. 2.

BY RICHARD F. PEARSALL, BROOKLYN, N. Y.

In my former paper a preliminary discussion of certain genera in Geometridæ made plain the need for a general rearrangement of this group. But this cannot be done as regards all of the species without much close study and comparison of types. Therefore, I venture at this time only to outline what seems to me the most rational method of arrangement into sub-families and genera—to include new material and to correct many errors in definition, and in some cases identification of generic types, as given by Dr. Hulst (Trans. Am. Ent. Soc., xxiii, 245, 1896). I claim nothing original in my work, for I consider the general scheme, as devised by Dr. Hulst, the best that can be produced, nor do I need to add to his introduction of it, as given in the article referred to, except to say that I am strongly in accord with him when he states that this family are most nearly related to the Noctuidæ. In my arrangement of genera I place, therefore, *Paleacrita* at the head of the series.

Following largely the characterization as given by Dr. Hulst, they separate thus :

*Geometrina.*

## Synopsis of families and sub-families.

- |  |               |
|--|---------------|
| Hind wings, vein 5 present, strong . . . . .   | Geometridæ.   |
| Hind wings, vein 5 absent, or a fold only . . . . .  | Ennomidæ.     |
|  | Geometridæ.   |
| 1. Antennæ ♂ unipectinate . . . . .  | Monotaxinæ.   |
| Antennæ ♂ not unipectinate . . . . .   | 2.            |
| 2. All wings with vein 5 nearer 6 than 4 . . . . .   | Geometrinæ.   |
| Fore or hind wings with vein 5 at middle of cell or nearer 4 than 6 . . . . .  | 3.            |
| 3. Hind wings, vein 8 coalescing with cell to middle, or if separate, joined with it by a cross-bar, at or beyond middle . . . . . | Hydriominæ.   |
| Hind wings, vein 8 separate from cell, or joined at or near base only . . . . .  | 4.            |
| 4. Hind wings, 8 shortly joined with cell at or near base . . . . .  | 5.            |
| Hind wings, 8 separate from cell . . . . .   | Brephinæ.     |
| 5. Hind wings, 8 joined with cell near base, shortly then rapidly diverging . . . . .  | Sterrhinæ.    |
| Hind wings, 8 joined with cell at base, then subparallel with it . . . . .   | Monocteniinæ. |

## Ennomidæ.

1. Hind wings, 8 coalescing with cell at base ..... Fernaldellinæ.  
Hind wings, 8 separate from cell ..... 2.
2. Frenulum absent ..... Palyadinæ.  
Frenulum present ..... 3.
3. Antennæ nearly joined at base ..... Sphecetodinæ.  
Antennæ normally placed ..... 4.
4. Antennæ three-fourths length of fore wings; legs very long ..... Mecoceratinæ.  
Antennæ never more than two-thirds length of fore wing; legs normal ..... 5.
5. Fore wings, 7 separate from 8 and 9 ..... Melanchroiniæ.  
Fore wings, 7 stemmed with 8 and 9 ..... Ennominiæ.

From this group is excluded the sub-family of Strophidiinæ, now constituting the family Epiplemidæ. They are sufficiently removed from the typical forms of Geometridæ to warrant this perhaps, by the want of humeral angle at the base of vein 9 on the hind wings, and, in the case of *Callizzia*, by the broadening of the inner margin of the hind wings, which, when the insect is at rest, is rolled round the body, in the manner of the Tineoidea, the upper half overlapping it, while the fore wings are extended at right angles, as in most Geometridæ.

Starting with the sub-family of Hydriominae, I have amalgamated with it the Dyspteridinæ, a sub-family established by Dr. Hulst, upon the supposed absence of the frenulum, in certain species. Finding that this appears to be constant in only two of his species, and that in the Ennomidæ the same feature occurs, I have determined to abandon its use, as showing when absent merely a tendency toward degeneration (as in the Sterrhinæ and Geometrinæ, by the partial obsolescence of the hind legs), and not worthy of basic consideration.

The Brephinae find a final resting place at the close of the family of Geometridæ, for by the presence of vein 5 in the hind wings they belong with this series, and the presence of hair pencil on hind tibiæ of ♂ in *Brephos infans* (an observation I have not seen recorded) fixes beyond further question their family relationship.

The Ennominiæ remain an unwieldy mass, but afford no characters which I can detect, that are stable enough to warrant more than generic separation.

## Hydriominae.

Beginning with Paleacrita, the genera can be arranged in a sequence which is natural both as to structure and venation. The wingless female gradually develops into one fitted for flight, while the male degenerates in alar expanse, especially on the hind wings, the series reaching a full development in both sexes as it progresses. A synopsis of the genera will be given at the close of my work on each sub-family.

I have dropped both *Cysteopteryx* and *Agia*, genera founded by Dr. Hulst, the former upon a variety of *Nyctobia limitata*, and the latter on a species previously described by Dr. Packard as *Lobophora viridata*. Dr. Packard's species, however, is not a true *Lobophora*, but belongs under *Nyctobia*.

The genus *Tallegda*, founded by Dr. Hulst, falls because the type *montanata*, Pack., is a true *Lobophora*, Curt. The supposed absence of hair pencil on the male, by which Dr. Hulst separated it, is an error. It is present and very conspicuous, but lies in a cavity between the thorax and abdomen beneath. Probably Dr. Hulst looked for the sheath or groove in hind tibia, where it usually rests, and finding none, supposed the hair pencil was wanting.

The genus *Opheroptera*, Hub., should be dropped, the only species under it, *O. boreata*, having been very doubtfully catalogued by Staudinger, from Greenland, many years ago.

(To be continued.)

## CORRECTION.

In the November number of this Journal, page 333, Dr. Ashmead has described a parasite of the Grape-berry moth, giving the scientific name of the moth as *Eudemis bortana*. The specific name should be *botrana*. This European name has been applied to the American Grape-berry moth by all writers since 1870, but as Mr. W. D. Kearfott and myself have just demonstrated in Bulletin 223 from the Cornell Agricultural Experiment Station, and also in the Transactions of the American Entomological Society for December, 1904, the American insect is specifically distinct and easily separated from the European Grape-berry moth. We find that the American Grape-berry moth should bear the name of *Polychrosis viteana*, Clemens. The European *Eudemis botrana* is not known to occur in this country, and the parasite was bred from the American species, so the title of Dr. Ashmead's description should be corrected to include the American name of the Grape-berry moth and not the European.

M. V. SLINGERLAND.



## PRELIMINARY LIST OF THE MACRO-LEPIDOPTERA OF ALBERTA, N.-W. T.

BY F. H. WOLLEY DOD, MILLARVILLE, ALTA.

(Continued from Vol. XXXIII., p. 172.)

It is now over three years since I published a list of Albertan butterflies under the above title. The list gave promise "to be continued," and it was fully intended at the time to publish the continuation the same year, but for a variety of reasons it had to be postponed. The delay, however, has not been without advantages. Not only have a number of species come to hand that had not been recorded here up to that time, but many that were then standing under names by which I had known them for years, have been found to be wrongly named, and several of them have been described as new species. Closer study, too, of long series, has resulted in a better understanding of nearly allied forms; and it is hoped that some of the notes here appended, though they have no claim to perfection, will enable some obscure species to be more easily separated than they have been hitherto. At the same time, I much regret that I have not been able to make more comparison of local material with that from other districts. Not only has it been hard to spare the time which much exchanging calls for, but it has often proved a very difficult, if not impossible matter, to get by exchange some of the commonest species, their very commonness seeming to render them, so to speak, scarce, at least in collections. I hope, however, to pay more attention to exchange in the future, and when more forms from other localities have come to hand the result of their study, and comparison with their Alberta representatives will probably be published from time to time.

Of the radical changes that have taken place in classification since my list of butterflies was published, enough has been said. Of the two recently published North American lists, I have preferred to follow that of Prof. Smith, as it seems to me to give a better arrangement of the Noctuidæ, or at least of the species in their respective families, and it is the Noctuidæ that have always been my favourite group. Though I am doubtful as to whether the term is any longer recognized, or if so, just where the line is drawn, I have included all the old-time "Macros," meaning thereby those genera which used to be known in European lists fifteen years ago as Sphinges, Bombyces, Geometræ, Cuspidatæ, and Noctuæ. Though I still study them as with the "larger fry," the Hepialidæ at any rate have been eliminated from their former position, as

have also the Cossidæ, and of the impending removal of the latter to the "Micros," it is quite fifteen years since I first heard the suggestion. In the present list I have attempted considerably more in the way of study than I did in the butterflies. I have made more comparisons and exchanged a far greater amount of correspondence. In one instance, that of *Cosmia*, I have taken the liberty of differing from the authors of all our recognized standard works, and believe a revision of the synonymy, by someone who has seen the types of Grote and Walker, to be necessary. This decision is only after a close inquiry into the matter, a study of a considerable quantity of material from the old world as well as from the new, and correspondence with several specialists who were able to give me information on the subject. It may be, however, that in this, as well as in other points concerning identity, I have come rather too hastily to conclusions. I am indebted to Prof. J. B. Smith and Drs. Ottolengui and Dyar for the names of my Sphingæ, Bombycæ, Notodontidæ, and a few other families allied thereto. The list of these is not a long one, but I am rather inclined to think that their apparent scarcity may be due to the fact that, in this district at any rate, they are of quiet and retiring habits, and do not often show up. It is to the Noctuidæ that most attention has always been paid, and Prof. Smith has been unceasing in his assistance to me in this group. I am also most fortunate in being in correspondence with Sir George Hampson, of the British Museum, where, of course, a very large number of types are to be seen, and the sending to him of a number of species, with the names by which I have known them, has resulted in the detection of many errors which would probably have otherwise still been overlooked. The first instalment of the Noctuidæ has quite recently been published in Vol. IV. of his "Catalogue of the Lepidoptera Phalænæ in the British Museum," and as a very large number of North American species are therein figured, many of them for the first time, it proves a valuable aid in the determination of species. Dr. Holland's "Moth Book," too, has supplied a long-felt want. In all works of the above kind, however, the practice of sometimes figuring the male of one species and the female of another very closely allied to it, is rather to be deprecated, as it is apt to give the impression that a merely sexual difference is really specific, there not unfrequently being less difference in facies between two species in the same sex than there is between the two sexes of either. It must be borne in mind that in making comparisons between closely allied species, my opinions are based on superficial characters, and I have almost com-

pletely ignored genitalic differences claimed by Prof. Smith. It is, I think, for superficial characters that most of us naturally look, and though the "genitalia test" is doubtless of the highest value as an aid, I am not aware that its infallibility is an accepted fact. I have not, however, studied the matter, and am quite willing to accept it at its estimated worth. The genus *Euxoa* is perhaps the most difficult in all the Noctuidæ to understand. Species run so very close together, and vary so tremendously *inter se* that it is often almost impossible to tell where one ends and another begins. It is probable that many groups in this genus will never really be made much of without careful breeding from known females. The matter is intricate enough in dealing only with material from one locality, but when geographical variation has to be taken into account, I believe there is hardly a genus in all the Lepidoptera in which species are harder to define. In the Noctuidæ I have given references to all published figures of western species known to me elsewhere than in the works of Dr. Holland and Sir George Hampson.

Unfortunately, not much attention has as yet been paid to the Geometridæ in this district. But though for that reason records have not been very carefully kept, the notes and dates given, as far as they go, have been very carefully prepared, and may be relied upon as being tolerably accurate. The Rev. G. W. Taylor has recently commenced a special study of the whole group, and through his kindness at least half of those here listed are now named, which could not have been named three years ago owing to there then being no one working on them that I knew of. Amongst those that I had at that time named, it turns out that the late Dr. Hulst had made several peculiar errors. The names I now give are all on the authority of Mr. Taylor, and the (??) are his also.

It is often a difficult matter to decide whether to put down a species as "common" or "rare." The majority of species seem to have their special seasons or series of seasons; and favourable or unfavourable conditions for existence seem sometimes to show their effects on an entire genus. Almost every year something or other turns up in some numbers that has always been considered a great rarity, or else never before been met with at all, and *vice versa*. Every moth-collector of experience must know, too, how sometimes a species shows up rather freely for one or two nights only, though to all appearance on the preceding and succeeding nights the conditions are practically the same.

All captures, unless otherwise expressly stated, refer to the district near the head of Pine Creek, about eighteen miles south-west of Calgary.

The "Billings's mill" locality, ten miles further west, in the spruce timber, has been described in my preface to the butterflies. "Blackfalds" is, I believe, intended to refer to the same general locality as "Lacombe" in the butterflies. A type specimen referred to as "at Washington," means that it is in the U. S. National Museum at that place, and "at Rutgers College" signifies Prof. J. B. Smith's collection. It has been a common error in the past amongst describers of species to record a large percentage of material taken on British territory, between Winnipeg and the Pacific, as coming from "B. C." Incidentally, the geographical error is not confined to entomologists, as "B. C." is erroneously engraved upon the door-key tags, menus, etc., at the C. P. R. chalet at Laggan. The eastern boundary of British Columbia is, I believe, the summit of the Rocky Mountains, 5 or 6 miles west of Laggan. In one instance among the many corrections of the error that I have made in this paper, the actual locality mentioned (Roundthwaite) as being in "B. C." is actually about 650 miles distant therefrom as the crow flies. There are several types referred to "B. C." which I rather suspect of coming from Manitoba or the North-west Territories, though I am quite unable to trace them.

## SPHINGIDÆ.

95. *Hemaris diffinis*, Bdv.—Common at flowers of wild gooseberry. End May and June. Larva on snowberry.

96. *Lepisesia flavofasciata*, Walk.—One fine ♀ near Billings's lumber mill, June 5th, 1898.

97. *Deilephila galii*, Rott., var. *chamænerii*, Harr.—Common at flowers of bergamot, wild gooseberry, etc., at dusk. June and July.

98. *D. lineata*, Fabr.—Rather rare at cultivated "pinks" and other flowers at dusk. My specimens are all from near mouth of Fish Creek. I think I have seen it on the hill prairie occasionally. July.

99. *Sphinx Vancouverensis*, Hy. Edw., var. *albescens*, Tepper.—Not rare, flying at dusk, or at rest in daytime. June and July.

100. *Smerinthus Jamaicensis*, Dru., var. *geminatus*, Say.—Rather common flying round willow bushes after dark, and at light. June and July.

101. *S. cerysii*, Kirby.—Not at all common. Same method of capture as preceding species. June.

## SATURNIDÆ.

102. *Samia Columbia*, Smith.—Probably fairly common, but it seems to me to be more of a prairie than a foothill species. I have only 4 ♂

specimens taken at light, one of which has been labelled *Columbia* by Prof. Smith. They agree pretty well with the figure of that species in Dr. Holland's book, but lack the reddish shading of the outer band there shown, which shading, as mentioned in the text, is supposed to be characteristic of *Gloveri*. I cannot, however, detect it in his figure of the latter species. I have a pair sent me from the States, but without data, labelled *Gloveri*, which have certainly a very faint purplish shading in outer band, but the central band has less of a purplish tint, and in this respect they are quite unlike Dr. Holland's figure of *Gloveri*. The specimens are a good deal larger than mine, but otherwise their distinctness does not satisfy me. However, comparison with specimens from an unknown locality is eminently unsatisfactory. I have occasionally found empty cocoons of a *Samia* on *Salix* near the head of Pine Creek (*i. e.*, in the hills), but never with larvæ, and rarely with imagines. It is rather more common about ten miles further east, near the mouth of Fish Creek, but the only time I tried "assembling" with a ♀ there. I met with no success, probably through ignorance of the correct time for flight. It is a fairly regular, though not common, visitor to the Calgary electric lights, and I have occasionally been brought specimens taken in houses in the town.

During a trip made down the north bank of the Bow River in 1899, I noticed larvæ that I took to be *Columbia* common in some spots on osier growing on the river banks. Dr. Fletcher has bred moths from larvæ from the Lacombe district which he tells me are "more like *Gloveri* than my conception of *Columbia*." He reports that the larvæ at Lacombe feed on *Eleagnus argentea*, but I have never observed them on that shrub myself.

## SYNTOMIDÆ.

103. *Scepsis fulvicollis*, Hbn.—A single specimen at head of Pine Creek, flying in sunshine, July 25th, 1898, and another on Red Deer River bottom at snowberry flowers, in sunshine, about July 7th, 1904.

## LITHOSIIDÆ.

104. *Crambidia casta*.—Not rare at light. Middle Aug. to middle Sept.

105. *Hypoprepia miniata*, Kirby.—Two specimens only, a ♀, Blackfalds (near Lacombe), Alta., Aug. 1st, 1902 (Gregson), and a ♂, head of Pine Creek, July 25th, 1903, at light, the latter named by Dr. Dyar. Both are quite fresh specimens.

## NOLIDÆ.

106. *Celama pustulata*, Walk.—Not rare, at light and dusk. July.

## ARCTIIDÆ.

107. *Eubaphe aurantiaca*, Hbn., var. *rubicundaria*, Hbn.—Common flying in sunshine. End of June and July. I have only seen a single ♀.

108. *Dodia Alberta*, Dyar.—Described from Calgary. Probably not rare in the spruce some seasons, though I have only taken two specimens from near Billings's lumber mill in early July. These are the diaphanous gray form referred to in the description. A third, taken at head of Pine Creek on June 11th, 1900, by Mr. Hudson, is the specimen there mentioned as being washed with white, and which I had looked upon as a distinct species. Type 5747, U. S. Nat. Mus., has been divided. The left wings are in the National collection mounted on a slide, and the rest of the specimen is in my own collection. Though I have looked out for it, I have not met with the species since 1900. At rest it resembles *Eubaphe* in form.

109. *Estigmene acraea*, Dru.—Common in the town of Calgary, and probably on the prairies eastward. A few specimens were taken at head of Pine Creek during 1903, but as the species had not been observed there previously, they may have been the progeny of live ♀♀ brought by Mr. Hudson or myself from the town. June.

110. *Neoarctia Beanii*, Neum., Laggan (Bean).—Described from there, I believe. I have a single specimen from Mr. Bean, July 9th, 1900, bred from larva on willow; var. *fuscosa*, Neum., is from the same locality.

111. *N. yarrowi*, Stretch.—A single specimen was taken on Aug. 18th, 1902, on the bare summit of Mt. Niblock., near Lake Agnes, Laggan, at an altitude of about 8,000 feet, by Dr. Wm. Barnes.

112. *Phragmatobia fuliginosa*, Linn.—A single ♀ flying in sunshine, May 27th, 1894.

113. *Arctia caja*, Schrank., var. *Wiskotti*, Staud.—Mr. Sanson records "var. *Utahensis*" from Banff. The name stands in the latest lists as a synonym of *Wiskotti*.

114. *Hyphoraia lapponica*, Thunb.—Occasionally in the hills at light, rest, or flying in sunshine. Fairly common during 1902, and at dusk in 1904. Middle June and July.

115. *Apantesis virgo*, L.—A single ♂ taken at light, July 22nd, 1903, is apparently typical. A pair from Blackfalds, July 1st and 2nd, 1902, have, Mr. Gibson tells me, the markings on secondaries much heavier than in the eastern form. These are the only Albertan specimens I have seen. Mr. Gregson reported the larvæ of this species to be abundant at Blackfalds during 1903. Mr. Arthur Gibson records the species from Edmonton, in Northern Alberta.

116. *A. virguncula*, Kirby.—Two ♂♂ and a ♀ are all the specimens I have ever seen here. They were taken in different years. End of June and July.
117. *A. michabo*, Grt.—A single ♀, at rest, June 9th, 1893.
118. *A. parthenice*, Kirby.—Not common at light in some seasons. The only ♀♀ I have taken have been bred from larvæ picked up haphazard. Middle July to middle August. The secondaries of the ♀ are of a much deeper red than in the ♂, and in one specimen the white markings on primaries have a very decided reddish tinge.
119. *A. oithona*, Strk., var. *rectilinea*, French.—Recorded from Calgary by Mr. Willing, on the authority of Mr. Gibson.
120. *A. Quenseltii*, Payk., var. *turbans*, Christoph.—This species, which formerly passed as a miniature *virguncula*, used to be very common, more especially east of the hills, eight or ten years ago. The larvæ, which fed on Galium, might then be captured in some numbers in holes dug for fence posts, and left open for twelve hours or so. Of late years it has been far less common, but has come occasionally to light. None of my specimens have the orange secondaries mentioned by Mr. Gibson in his paper on this genus (CAN. ENT., XXXV., 144).
121. *A. obliterata*, Stretch.—A single male, at light, head of Pine Creek, Aug. 15th, 1901. This, which I believe is the only specimen of the form known, is referred to in CAN. ENT., XXXV., 144, and figured on Pl. 5 of that vol. It is still in my collection. It differs from any of my *turbans* in having rich orange secondaries instead of yellow, two additional discal spots, and a dark dash near and parallel to the inner margin. I never suspected it of being distinct from *turbans* until Mr. Gibson's paper was published, and fancy it will eventually prove to be but a variety of that species.
122. *A. Bolanderi*, Stretch?—Mr. Gibson referred a ♂ (May 24th, 1897) and three ♀♀ doubtfully to this form, which Dr. Dyar treats as a synonym of *Blakei*. I have a similar ♂ dated June 3rd, 1903, and a third has been taken during June of the present year. Two of my ♀♀ I have always taken to be *determinata*. The other ♀ and the ♂♂ I have been inclined to consider distinct, on account of the much earlier date, lighter build, less hairy vestiture, and greater intensity of black on primaries. I have *Blakei* from Colorado, which at any rate can hardly be the same species as mine, from which it differs in being a stouter insect, broader winged, with more hairy thoracic vestiture, having four transverse bands

on primaries instead of two, longer and rather more heavily pectinated antennæ, and much less black on secondaries. Of my ♂ Mr. Gibson said, "May be *Bolanderi*, but may simply be a variety of *determinata*." I hardly think it is the latter.

123. *A. Nevadensis*, G. & R., var. *incorrupta*, Hy. Edw.—So far I have only taken two ♂♂ and two ♀♀, July 7th to Aug. 6th. The ♂♂, on Aug. 6th, were taken at Calgary town lights. A third ♀, June 28th, 1899, has primaries marked as *incorrupta*, but has pure black secondaries and a black body. I have two ♂♂ *Nevadensis* from Glenwood Springs, Colo., which look quite a different species. In fact, they come very much nearer to *Blakei*, from the same locality, than to Calgary *incorrupta*, specimens of which have been seen by both Dr. Dyar and Mr. Gibson.

124. *A. Williamsii*, Dodge, var. *determinata*, Neum.—Common. End of June and July. In one specimen there is no trace of the 3rd transverse band (= typical *Williamsii* ?), and the 4th and W marks are very faint. I have no ♀♀, unless those mentioned above under *Bolanderi* belong to this species. The ♂ antennæ are sometimes variegated, black and cream.

125. *A. celia*, Saund.—Banff, June 16th (Sanson). On the authority of Mr. Gibson. I have never to my knowledge seen a specimen.

126. *A. sp.*—A series of nine specimens have been a puzzle alike to Mr. Gibson and Dr. Dyar. Seven ♂♂ and one ♀ were taken near Billings's lumber mill on June 19th and 26th, 1898, and a ♀ is from Blackfalds, taken by Mr. Gregson on Aug. 9th, 1902. I believe the series to represent one extremely variable species. Four ♂♂ somewhat resemble *Williamsii* in maculation, but are smaller and much blacker. Two ♂♂ and two ♀♀ are like miniature *virguncula*. I have not taken the species for several seasons.

127. *Parasemia plantaginis*, Linn.—Not common on creek bottoms on the hill-prairie. Common in the spruce and westward to the mountains. End June and July. I have specimens like all the varieties listed in Dyar's and Smith's lists except *Geddesi*. An interesting article on Laggan *petrosa*, by Mr. Bean, will be found in CAN. ENT., XXVII., 87, and Pl. II.

128. *Halisidota maculata*, Harr.—A single ♂ at light, June 25th, 1898, was all I ever saw of this species until last year (1903), when I found the decidedly conspicuous larvæ common on different species of poplars in gardens in Calgary. These pupated in September, and moths emerged in the house at the end of February of the present year.



## PERICOPIDÆ.

129. *Gnophala latipennis*, Bdv., var. *vermiculata*, G. & R.—A single specimen at Lacombe, July 27th, 1900, in sunshine, on a flower head (P. B. Gregson). I have seen the specimen. The name is on the authority of Dr. Fletcher, who says that the species has never before been recorded north of Colorado.

## AGARISTIDÆ.

130. *Androloma MacCullochii*, Kirby.—Rare near Calgary, probably more common in the mountains. June 19th (worn), Billings's lumber mill; Laggan (fresh), July 17th to 25th; and (worn) Aug. 8th. Taken flying in sunshine.

131. *Alypia Langtonii*, Couper.—Common in the spruce, less so in the poplar woods on Pine Creek. End May and June.

## NOCTUIDÆ.

132. *Acronycta Canadensis*, Smith and Dyar.—Very rare; four specimens only, 2 ♂♂, 2 ♀♀, June 15th to July 6th. I don't think any actual description of this has ever been published, but a Calgary ♀ (now the type) is mentioned in Smith and Dyar's Monograph, where the form is referred doubtfully to *insita*, Walk. Material sent Prof. Smith from here later confirmed his opinion as to the validity of *Canadensis* as a species. He returned me a ♀ "like ♀ type, but better marked," and a ♂ with maculation scarcely traceable. Taken at treacle. The type is in the U. S. National Museum.

133. *A. cretata*, Smith.—A ♂ June 22nd, 1901, and a ♀ July 6th, 1896, both, I believe, at treacle. Prof. Smith has seen the ♀. With so little material at hand, I am not in a position to question the distinctness of these two Calgary forms. I can only say that my *cretata* looks to me like my *Canadensis*, with much stronger and blacker maculation, and whiter and less powdered ground colour. I submitted to Sir Geo. Hampson the ♀ *Canadensis*, "like type," which was still labelled "*insita*, var. *Canadensis*," and a ♂ which closely resembled my ♀ *cretata* returned by Prof. Smith. His verdict was: "Your *insita* is quite a different species from Walker's *insita*, of which we have the type. It is *lepusculina*, Gn., ♀, and your *cretata* is the ♂ of it." My ♀ *cretata* is, however, exactly like Smith and Dyar's figure, and my ♂ is evidently the same species. The type is in the U. S. National Museum collection at Washington.

134. *A. Manitoba*, Smith.—A single ♀ July 1st, 1898, at treacle, which Prof. Smith has seen. It resembles Smith and Dyar's figure, but has paler primaries, and secondaries are somewhat smoky outwardly.

[NOTE.—The text refers to this figure as a ♀, but mentions the existence of two ♂♂ only.]

135. *A. quadrata*, Grote.—Has been fairly common some seasons at treacle. June and July.

136. *A. revellata*, Smith.—About the same as *quadrata* in dates and numbers, etc. Formerly referred to *grisea*.

137. *A. tartarea*, Smith.—Described in CAN. ENT., XXXV., 127 (May, 1903), from a ♂ taken at treacle near Calgary, on June 23rd, 1898, the only specimen I have ever seen. I had supposed it to be a dark *revellata*. The specimen is in the U. S. National Museum.

138. *A. illita*, Smith.—A single ♂, which Prof. Smith says is "more powdery than usual," at treacle on the Red Deer River, about fifty miles N. E. of Gleichen, June 20th, 1901, rather worn.

139. *A. emaculata*, Smith.—(Dyar's list, No. 1038, omitted from Smith's list in error). Common at treacle in "Acronycta" seasons, June and July. Larvæ on *Salix* and *Rosa*. I think the type is a ♂ from Calgary, and is in the Rutgers College collection. Formerly sent out as *impressa*.

140. *Apharetra pyralis*, Smith.—Described from Calgary. Very rare, one ♂ and three ♀♀ being all I ever took, July 13th to Aug. 23rd. Pl. XIII., fig. 11, in Smith and Dyar's Monograph, is the ♀ type, and not fig. 12, "male adult," as there stated. The specimen is figured also in Ent. News, VI., No. 10, Pl. XV. The type is in the U. S. National Museum at Washington.

141. *Hadenella tonsa*, Grt.—Redescribed partly from Calgary material as *subjuncta* (CAN. ENT., XXX., 323, Dec., 1898), and sent out by me previous to that as "*Bryophilid*, sp." Fairly common at treacle some years. July. The type of *subjuncta* is in the Museum at Washington.

142. *Caradrina extimia*, Walk.—July and August. Common.

143. *Caradrina miranda*, Grote.—Not common. Treacle and light. Middle June to middle July. Sir Geo. Hampson says it is "larger and darker than the typical form," so the species may perhaps be *nitens*. Dyar (CAN. ENT., XXXVI., 29, Feb., 1904).

144. *C. punctivena*, Smith.—Not at all common. June and July, treacle. One of the ♂ types is stated to be from "McLean, B. C." McLean is in Assiniboia, and 450 miles in a straight line from the B. C. boundary. Prof. Smith thinks that this may prove to be synonymous with *rufostriga*, Pack.

145.—*Hillia senescens*, Grt. }  
 146. *H. vigilans*, Grt. } Both very rare previous to 1903, when I took about a dozen specimens of each at treacle in September. The form Prof. Smith calls *vigilans* is dark red, and except for the s. t. line and discoidal spots, almost unicolorous, with conspicuously pale whitish collar. *Senescens* is ochreous, tinged with reddish, and with all the maculation evident. I had always believed them distinct, but until last year had not sufficient material to enable me to press the point. I have now submitted a series of each to Prof. Smith, and he considers that the names must now stand for distinct species. The species sent out by me in some numbers seven or eight years ago as *crassis* turned out to be *Mamestra obscura*, a species somewhat similar in type of maculation to my *vigilans*, but without pale collar, and smaller and blacker. A ♂ taken on Aug. 1st, 1896, of size and general appearance of *vigilans*, but almost entirely black, with unicolorous collar, may perhaps have been the true *crassis*. Unfortunately this specimen was completely destroyed in transit to Rutgers College, and still requires to be duplicated. Breeding might prove *senescens* and *vigilans* dimorphic forms of one species, but I very much doubt it.

147. *H. algens*, Grt.—Generally distinctly rare, but, in company with the two foregoing species, fairly common at treacle last year, evidently a "Hillia" year. As a matter of fact, the other two species confined themselves to those fence posts treaced on a creek bottom, while *algens* seemed rather more fond of those on the hillside. September.

148. *Hadena (Luperina) niveivenosa*, Grt. Very rare. End July and August.

149. *H. (L.) passer*, Grt.—Very rare. End June and July.

(To be continued.)

#### NOTE ON MACRONOCTUA ONUSTA, GRT.

The larvæ of this Noctuid moth were again found at Ottawa the past season, in beds of Irises, on the grounds of the Central Experimental Farm. They were not, however, at all numerous, and did not do any appreciable harm this year. Two larvæ were collected on July 28, one of which was inflated; the other pupated on Aug. 1, the moth emerging on Sept. 7. Another larva was found on Aug. 4, the moth appearing on Sept. 15. The pupa of the former specimen was much larger than any of those obtained in 1903, an account of which appeared in the last Annual Report of the Entomological Society of Ontario. This pupa measured 30 mm. in length and 7.5 in width.

ARTHUR GIBSON.

## ON THE SYSTEMATIC POSITION OF THE ÆGIALITIDÆ.

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

The family Ægialitidæ, then known by but one species, was placed by Dr. LeConte (Classification of the Coleoptera of North America, p. xxxvi.) in association with those Heteromera having the anterior coxal cavities closed behind. This structure is also assigned to *Ægialites* in the detailed account of the insect on page 388 of the same work. Dr. Sharp, in his recent treatise on insects (Cambridge Natural History, Vol. VI., p. 265), speaks of the anterior coxæ as being "completely closed in," while Dr. Geo. Horn, though dissecting a specimen for a study of the mouth-parts, seems to have overlooked the coxal structure, or he would certainly have alluded to it in his notes on the genus (Trans. American Ento. Soc., XV., p. 27). In view of the statements in the books, I was surprised, a few months ago, by the receipt of a letter from the Rev. J. H. Keen, in which he asserted that the cavities of the anterior coxæ are open behind, as is indeed the case. Mr. Keen's observation is of great importance, in that it opens the way to a proper appreciation of the systematic position of the insect.

Having been supplied with specimens of *Ægialites Californicus*, Mots. (*debilis*, Mann.), by Mr. Keen, and of *Æ. Fuchsii*, by Mr. Fuchs, I have been able to make careful dissections of both, and find that in neither case do the epimera reach the tip of the prosternum. There is thus left a gap of some extent, though the posterior aspect of the cavities is not open for its entire width as it is in *Pytho*. This being true, it becomes necessary to make a change in Dr. LeConte's table, removing Ægialitidæ from proximity to the Tenebrionidæ, and transferring them to group 4. Here they may be placed next to the Pythidæ, with which they agree in so many respects in larval as well as adult characters, and from which they may be distinguished by the greater number of ventral abdominal segments, there being six of these in *Ægialites* and but five in the Pythidæ.

To my mind, the sequence of Heteromeroous families adopted in the LeConte and Horn "Classification" is not satisfactory, the Pyrochroidæ being too far removed from the Pythidæ. These families seem to me to be quite closely related, and I prefer the view presented by Dr. Sharp (l. c., p. 266), whereby they are placed in juxtaposition. If now, we place the Ægialitidæ between the Melandryidæ and the Pythidæ, I think we shall

have an arrangement that will do little violence to the affinities of these four families, as far as our present knowledge of the larval and adult structures allows us to judge.

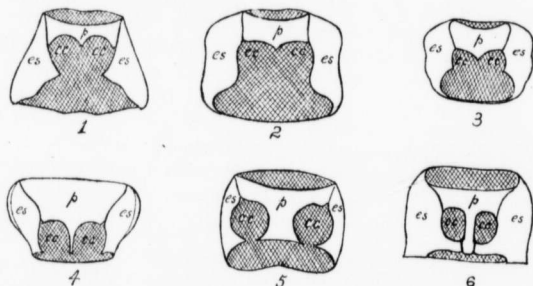


FIG. 10.

In order that the characters alluded to may be more readily appreciated, I have prepared sketches (Fig. 10), showing the structure of the under side of the prothorax in the Melandryidæ, Pyrochroidæ, Pythidæ, Ægialitidæ and Tenebrionidæ. 1 represents *Melandrya striata*; 2, *Pyrochroa flabellata*; 3, *Pytho Americana*; 4, *Lecontia discicollis*; 5, *Ægialites Californicus*; and 6, *Nyctobates Pennsylvanica*. All are lettered alike, *p* indicating the prosternum, *cc* the coxal cavities, and *es* the thoracic side pieces, the sutures between the episterna and epimera being obliterated or indistinct.

#### THE BEE-GENUS *APISTA*, ETC.

When writing (p. 330) on the genus *Apista*, F. Smith, 1861, I unfortunately overlooked the fact that the generic name is long preoccupied (*Apista*, Hübn, 1816, and the similar *Apistus*, Cuvier, 1829). The bee genus from Brazil may therefore be known as *Egapista*, n. n., type *Egapista opalina* (*Apista opalina*, Smith).

I find that the name of the African bee-genus *Serapis*, F. Smith, 1854, is also preoccupied (*Serapis*, Link, 1830); it may be changed to *Serapista*; type *Serapista denticulata* (*Serapis denticulatus*, Smith).

The name *Eumorpha* proposed by Friese for a group of bees, is also preoccupied. The group *Rhodocentris*, Friese, includes the type of the prior *Heterocentris*, Ckll.; so the latter name must be used for the group, unless (as seems probable) it can be divided.

T. D. A. COCKERELL.

THE NYMPH OF *GOMPHUS FURCIFER*, HAGEN.

BY E. M. WALKER, B. A., M. B., TORONTO.

On the 18th of June, 1904, while collecting dragon-fly nymphs in Grenadier Pond, Toronto, I found two *Gomphus exuviae* resting on the surface of a thick growth of algæ a few feet from the edge of the pond. I examined the debris and black swamp mud from the bottom, just below the spot where the skins were taken, and found one nymph about two-thirds grown, apparently of the same species. On June 20th I found another exuvia on a similar part of the shore, and on examining the bottom I found several half-grown nymphs and one full-grown one, which was crawling along the surface of the algæ, evidently ready to transform. In the evening a male *Gomphus furcifer* emerged.

Since then I have taken several half-grown nymphs, but as the season for transformation was apparently over I got no more mature ones. All of the nymphs were found in the surface mud, at a depth of about one or two feet of water, the shore being low and marshy. I have kept one of the nymphs alive ever since.

The imagoes of *Gomphus furcifer* are not rarely taken in the country surrounding Grenadier Pond, and I have one female from De Grassi Pt., Lake Simcoe. It has always been considered an uncommon species, and the nymph was hitherto unknown.



FIG. 11.—Nymph of *Gomphus furcifer*.  
(Enlarged  $1\frac{1}{2}$  diameters.)

Nymph of *Gomphus furcifer* (Figs. 11 and 12).

Body elongate, depressed, covered with minute dense brownish scurfy pubescence; the legs very sprawling. Abdomen lanceolate, broadest at the fourth segment, the lateral margins as far as the apex of segment 8 regularly convex; segments 9 and 10 very long and narrow, together equal in length to segments 6, 7 and 8. Segment 8 nearly twice as broad at base as at apex, about two-thirds as long as segment 9. Segment 9 about three-fifths as broad at apex as at base, about as long as segment 10 with the appendages. Segment 10 equal in breadth throughout. Small lateral spines are present on segments 8 and

9, very minute on the former; otherwise the lateral margins are smooth and free from hair. Dorsal surface of abdomen as far as base of segment 6 evenly convex from side to side with a very faint median ridge, along which is a faintly impressed line; beyond this the ridge is somewhat more distinct and the sides slope more abruptly. The "scars," or irregular bare patches, on the dorsal surface of the abdomen are conspicuously marked on segment 1-8, and are represented on 9 by a pair of distinctly impressed lines. Width of metathorax about equal to that of the first abdominal segment. Wing-cases extending a little over the base of the fourth abdominal segment. Legs thinly fringed on both anterior and posterior margins with rather long hairs, except the posterior margins of all the tibiae, which bear a rather dense fringe. Antennae with the third joint about one-third longer than the first and second joints together, slightly broader at apex than at base. Mentum of labium about one-third longer than broad and a little more than two-thirds as broad at base as at apex, contracted in its basal two-fifths. Median lobe distinctly produced, the anterior border convex and bearing on its margin a dense fringe of short flat, light brownish hairs, in the midst of which at the apex is a pair of very small, shining, dark brown teeth, which are seen with some difficulty. Lateral lobes with the outer margins very convex, apex with a prominent hook and about six other nearly equidistant teeth along the inner margin, the basal one very small, the others prominent and of about equal size.

Total length, 33 mm.; abdomen, 22.5 mm.; hind femur, 6 mm.; width of head, 5.75 mm.; of abdomen, 7 mm.



FIG. 12.—Labium, from beneath, of *Gomphus fuscifer* nymph.

#### NOTE ON HAPLOA CONTIGUA, WALK.

When I was working on the Haploas, previous to the publication of my paper on "The North American Callimorphas" (CAN. ENT., XIX, 181-191), I appealed to Mr. A. G. Butler for information in regard to Walker's types, and he very kindly sent me sketches of the types of *Contigua* and *Confinis* as then standing in the British Museum collection, but as what was shown as the former was practically the same as the latter, I wrote that I thought there must be some mistake, and sent a drawing of what we, in this country, understood to be *Contigua*. Mr. Butler, in replying,

said I was quite right, and that Mr. Walker, with his usual carelessness, had got the *Contigua* label on the wrong specimen, and thanked me for calling his attention to the error, which he had corrected.

At the Annual Meeting of the Ent. Soc. of Ont., 26th and 27th October this year, I saw for the first time the D'Urban collection of moths deposited in November, 1871, in which I found a specimen of *Contigua* marked *Confinis* in Walker's handwriting, as confirmed by Dr. Bethune. This shows that Walker had confused his own species of these moths very badly.

HENRY H. LYMAN, Montreal.

#### POGONOMYRMEX OCCIDENTALIS.

On page 351 of this magazine Professor Cockerell notes his observation of the *Pogonomyrmex occidentalis* at Ruleton, within twelve miles of the western limit of Kansas, and considers this as the indication of the eastern limit or beginning of the arid region. Our investigations of the range of this large ant in Kansas have shown us that its eastern limit is found far to the east of the point mentioned. The species occurs as far east in this State as the Sixth Principal Meridian, or in the counties of Republic, Ottawa, McPherson and Sedgwick, on a line about two-fifths of the length of the State from the eastern border. One would scarcely be acquainted with climatic conditions in Kansas who should consider this ant as a mark of the "arid region," as west of the line indicated are found some of the best farming lands of the State. Especially is this true of the wheat lands, as the counties named are among those famous for the production of this cereal. Notwithstanding its occasional occurrence along the extreme eastern limit above indicated, the favoured home of the species is really within the western hundred miles of the State, and thence west to the mountains, where in specially suitable localities it sometimes occurs in astonishing abundance. From its habit of clearing about its mounds a considerable space of vegetation, this ant is not liked by farmers, and various measures have been taken to destroy it, one of the most successful being the pouring into the centre of the formicary, opened for the purpose, a quantity of carbon bisulphide, the opening being then closed to retain the fumes, which finally penetrate to the depths of the burrows, destroying the inmates. As these cleared spaces sometimes attain the diameter of twenty-four feet, and as the hills may occur a few rods apart, it will be seen that the ant is not a desirable occupant in cultivated fields. However, it is well known that regular cultivation of the soil of infested fields is a great deterrent to their occupation by the *Pogonomyrmex*, perhaps less through the dislodgment of well-established colonies than through the discouragement of new ones. Thus it comes to be true that in fields properly handled the ant ceases to be a general pest, and the few large colonies are readily destroyed by the means above indicated. The species is therefore economically of less importance than is sometimes believed.

E. A. POPENOE, Manhattan, Kan.



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## CORRIGENDA.

Page 144, line 19, for "Spring methods" read "Spinning methods."

Page 333, line 2, for "BORTANA" read "BOTRANA."