



FIG. 1

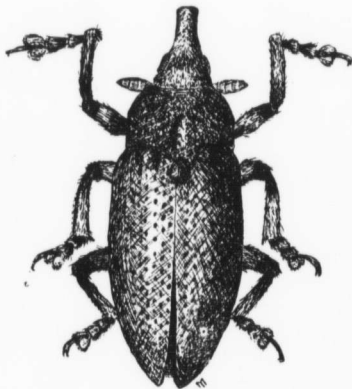


FIG. 6



FIG. 2

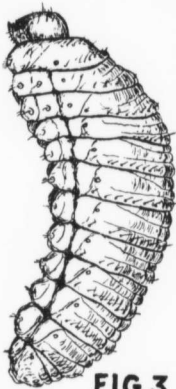


FIG. 3

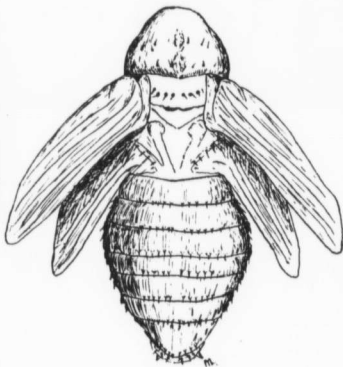


FIG. 4



FIG. 5

LIXUS MARGINATUS, SAY.

The Canadian Entomologist.

Vol. XLII.

LONDON, MARCH, 1910.

No. 3.

NOTES ON *LIXUS MARGINATUS* SAY.

BY MERRILL A. YOTHERS, E. LANSING, MICH.

While collecting under a fence at the Michigan Agricultural College on the 4th of September, 1909, I noticed a great many swellings, about as large as peas, on the stems of the low, flat shore weed, *Polygonum littorale*. Upon opening these, I found that they were galls, containing a snout beetle or its larva or pupa. Many of the beetles had already emerged from their galls, in which there was always a hole in the apex or anterior end of the gall.

Every beetle found was lying snugly in his or her nest, with head toward the terminal end of the twig.

A great many larvæ and pupæ were found. At least one twig was found which contained a larva, a pupa, an adult, and the empty galls from which adults had emerged.

The galls were generally scattered along the stems of the larger, healthier plants. Some were close to the base of the plants, and some were only a couple of inches from the tips, but more were found about half the distance between bases and tips. The galls near the tips being necessarily small contained the very young larvæ, while the larger galls near the base contained the pupæ, large larvæ, and adult beetles.

The beetles and galls were found only in the larger, healthier plants growing in protected places. None could be found on plants in such places as lanes, lawns and pastures, though luxuriant growths of the plant were found in such places.

At the time of first finding this insect (Sept. 4), I collected several adults, a couple of larvæ and a pupa. One of the larvæ was nearly full-grown, the other was not more than half-grown. Some of the beetles were just matured, others were quite ready to emerge, as some had already done.

On October 6th I collected several more adults, larvæ and pupæ. On this date I found some very small larvæ, as well as other sizes.

The life-history of this species is not entirely known, so far as I have been able to learn. The eggs must be laid just beneath the bark of the

plant or inserted into the pith. The season for egg-laying must of necessity be quite long, as both very young larvæ and emerged adults were found on September 4th and October 6th. Besides these stages, half-grown larvæ, mature larvæ and pupæ were found on both dates. Whether the latest adults to mature live over winter in the galls and do the egg-laying the next year I do not know. It may be that the larvæ or pupæ, or both, remain in the galls over winter and mature the succeeding spring; or the adult beetles that emerge in the fall may hibernate in protected places and regain activity in the spring and lay eggs for the succeeding generation.

A great number of the larvæ had been parasitized, as was shown by the absence of the larvæ and the presence of small holes in the galls through which the parasites had emerged. One of these parasites, a Braconid, was taken alive from a gall.

A fungous disease was also found in several galls. The larvæ were in these cases black, and covered with the fungous growth.

I quote from Say the original description of this species:

"Black, covered with minute, cinereous hairs, thorax impressed. Inhabits Central States. Body black, covered with short, minute, robust, recurved hairs, punctured. Antennæ rufous, club dusky. Thorax a little convex on each side, behind the middle of side rectilinear; a little contracted before, with an indented line above, more profound near the base, with dilated, confluent, slightly impressed punctures, not deeply sinuate at base, with regular series of punctures. Elytra, region of the scutellum indented; abdomen dull fulvous behind; length nearly seven-twentieths of an inch."

LeConte, in his Catalogue of Rhyncophora of North America, makes the follow comment: "This species is said to occur on the Lower Mississippi and in the Atlantic States. I have not identified it, nor was it known to Gyllenhal, who merely cites Say."

Dr. E. A. Schwarz, who kindly determined my specimens, said: "*Lixus sylvius*, Boh., is a synonym for *L. marginatus*, Say, and as this synonymy has not been disputed, it should stand."

The nearly-mature larvæ shown in fig. 3 measured 9 mm. This is the usual length. The pupæ (fig. 4) are a little shorter, measuring about 8.5 mm. in length. Arranged in pairs along the posterior margin of each dorsal segment of the abdomen are twelve stout setæ pointed with black. The adults (fig. 6) measure from 8 to 8.5 mm. in length. The greatest width is about 3 mm.

The galls (figs. 1 and 2) are of various sizes. The smaller ones, 6 mm. in length, containing the young larvæ; those 11 to 12 mm. in length and 7 mm. diameter containing the adult beetles.

The life-history of this species becomes all the more interesting from the fact that several other members of the genus have habits somewhat similar. *Lixus parvus* has been bred from galls in the stems of *Amelanchier*. *L. macer* was bred by Dr. Riley from the axis of the stems of *Chenopodium hybridum*. This species was also bred by Mr. Webster from *Helianthus*. *L. scrobicollis*, Boh., has been bred from *Ambrosia artemisiifolia* and *Ambrosia trifida*.

EXPLANATION OF PLATE 3.

- Fig. 1.—Gall, showing hole through which adult beetle has emerged.
 Fig. 2.—Gall, showing the inside hollowed out, where the larvæ and pupæ live.
 Fig. 3.—Mature larva.
 Fig. 4.—Nearly mature pupa.
 Fig. 5.—Proboscis, showing insertion of antennæ.
 Fig. 6.—Adult beetle.

THE JAMES FLETCHER MEMORIAL FUND.

In addition to the list of subscriptions to the above fund, which was published in the July, 1909, number of the CANADIAN ENTOMOLOGIST, the following amounts have been received:

Entomological Society of Ontario..Guelph.....	\$50 00
Collingwood Schreiber.....Ottawa.....	30 00
New York Entomological Society..New York.....	25 00
T. C. Keefer.....Ottawa.....	25 00
Natural History Society of British Columbia.....Victoria, B. C.....	20 00
Dr. Henry Skinner.....Philadelphia.....	15 00
Hon. Senator Bostock.....Ottawa.....	10 00
Geo. Hay, Sr.....“.....	10 00
Prof. C. C. James.....Toronto.....	10 00
A. G. Kingston.....Ottawa.....	10 00
Hon. F. R. Latchford.....Toronto.....	10 00
Dr. C. H. Merriam.....Washington, D. C.....	10 00
M. W. Maynard.....Ottawa.....	10 00

W. Scott.....	Toronto	\$10 00
Mrs. C. Schreiber.....	Ottawa	10 00
J. W. Tolmie	Victoria, B. C.	10 00
B. E. Walker	Toronto	10 00
Peter Whelen.....	Ottawa	10 00
James Ballantyne.....	"	5 00
Mrs. R. D. Brown.....	"	5 00
Walter Burman.....	Winnipeg, Man.....	5 00
Mrs. W. A. Burman.....	"	5 00
Dr. B. Barlow.....	Raleigh, N. C.....	5 00
T. E. Bean.....	Galena, Ill.....	5 00
Prof. S. Blair.....	Macdonald College, Que.....	5 00
President G. Creelman.....	Guelph.....	5 00
Miss M. Fitzgibbon.....	Toronto	5 00
Sir James A. Grant.....	Ottawa.....	5 00
Dr. L. O. Howard	Washington, D. C.....	5 00
Dr. C. Gordon Hewitt.....	Ottawa.....	5 00
Dr. A. Kinghorn	Liverpool, Eng.....	5 00
W. B. Lanigan	Winnipeg.....	5 00
Geo. Lang.....	Indian Head, Man.....	5 00
Dr. C. L. Marlatt.....	Washington, D. C.....	5 00
J. F. Orde.....	Ottawa.....	5 00
Rev. A. E. Richard	"	5 00
Dr. J. E. Roy.....	"	5 00
E. Baynes Reed.....	Victoria, B. C.....	5 00
E. Thompson Seton.....	Cos Cob, Conn.....	5 00
Miss M. F. Tolmie.....	Victoria, B. C.....	5 00
J. G. Taylor	Ottawa.....	5 00
C. H. Young.....	"	5 00
Prof. F. M. Webster.....	Washington, D. C.....	5 00
Misses A. and M. Williams and Mr. W. T. Williams.....	Victoria, B. C.....	5 00
F. W. Warwick.....	Buckingham, Que.....	5 00
T. C. Weston.....	Minneapolis, Minn.....	5 00
Prof. R. Ramsay Wright.....	Toronto	5 00
Women's Canadian Hist. Soc.....	"	5 00
J. W. Baldwin.....	Ottawa.....	2 00
Dr. P. H. Bryce.....	"	2 00

D. A. Campbell	Ottawa.....	\$ 2 00
A. H. Gallup.....	"	2 00
A. A. Girault.....	Urbana, Ill.	2 00
Miss V. Lees.....	Ottawa.....	2 00
E. A. Le Sueur.....	"	2 00
Chas. Macnamara.....	Arnprior, Ont.....	2 00
John Murphy.....	Ottawa.....	2 00
Prof. T. Wesley Mills.....	Montreal	2 00
Miss M. E. Murtfeldt.....	St. Louis, Mo.....	2 00
H. McKellar.....	Moose Jaw, Sask.....	2 00
Arch. Mitchell.....	Indian Head, Sask.....	2 00
Dr. C. F. Newcombe.....	Victoria, B. C.....	2 00
Prof. P. J. Parrott	Geneva, N. Y.....	2 00
R. F. Pearsall	Oliverea, N. Y.....	2 00
Miss M. B. Williams.....	Ottawa.....	2 00
E. G. White.....	"	2 00
Miss M. Brown.....	Halifax, N. S.....	1 00
J. J. Carter	Ottawa.....	1 00
R. H. Carter.....	Fort Qu'Appelle, Sask.....	1 00
John Dearness.....	London	1 00
H. Dawson.....	Hymers, Ont.....	1 00
Miss F. Davidson.....	Ottawa.....	1 00
Prof. J. S. Hine.....	Columbus, Ohio.....	1 00
W. H. Moore.....	Scotch Lake, N. B.....	1 00
Dr. M. G. McElhinney.....	Ottawa.....	1 00
A. G. Ruggles.....	St. Anthony Park, Minn.....	1 00
J. C. Sutherland.....	Richmond, Que.....	1 00
L. M. Terrill.....	Montreal	1 00
Fred. Harmer.....	Ottawa.....	50
Arthur M. McElhinney	"	50

Up to date there has been subscribed to the Fletcher Memorial Fund about \$1,700, which has nearly all been paid in. It has been decided to close the subscription list about the end of March, so it is hoped that any who have not yet subscribed to the Fund, but who wish to do so, will attend to this matter at once. The Committee hope to raise at least \$1,800. It has been decided to erect a drinking fountain at the Central Experimental Farm.—ARTHUR GIBSON, Sec.-Treas. of Committee, Experimental Farm, Ottawa.

A NEW WAX-SCALE FROM THE ARGENTINE.

BY T. D. A. COCKERELL, UNIVERSITY OF COLORADO.

The Coccidæ of the Argentine Republic must be considerably more numerous than the records show. A carefully prepared list, with full bibliographical details, was published by Eugenio Autran in 1907 (Bol. Minist. Agricultura, VII), but it shows only 32 species. One may now be added; I have had it in my possession for a number of years, but only recently, with the assistance of Miss L. H. Falk, have I been able to examine it in detail.

Ceroplastes Lahillei, n. sp.

Waxy scale about 3 mm. long, $2\frac{1}{2}$ broad and $1\frac{1}{2}$ high, solitary or aggregated in masses more or less surrounding the branch, the wax of the different individuals then completely confluent; wax creamy-white, wholly without red or brown; dorsal patch oval, consisting of the elongate-oval dorsal nucleus, and the six lateral and one anterior plates surrounding it, having their several nuclei distinctly developed; caudal patch with a large dark spot, consisting of the caudal horn; lateral wax abundant, convex in section, more or less concentrically grooved, with the usual broad vertical bands of chalky-white secretion. In lateral view the dorsal patch is hardly or not visible.

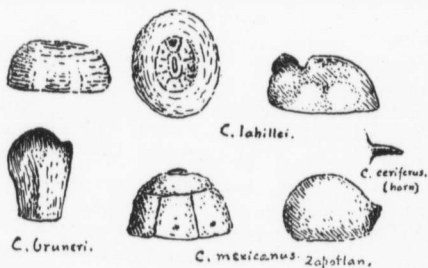


FIG. 5.

Female with wax removed very small, about 2 mm. long, $1\frac{1}{2}$ broad, $1\frac{1}{5}$ high; pale ochreous, with the broad low shining mammiform caudal horn deep chestnut-brown, in strong contrast; dorsum obtusely keeled, and sides with the usual tubercles. In lateral view there is a deep impression between the dorsal hump and the caudal horn.

March, 1910

Skin thick, strongly chitinized ; cephalic region remarkable for three broad lobes or tubercles, one on each side of the antennæ, and one between ; stigmatic spines very obtuse ; antennæ eight-jointed, joints 2 to 7 measuring in microns : (2) 37, (3) 52, (4) 60, (5) 37, (6) 37, (7) 30 ;

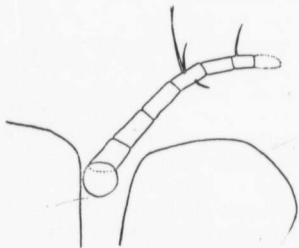


FIG. 6.—Antenna of *C. Lahillei*.

these antennæ are not quite like any others I have seen, but are rather similar to those of *C. formicarius*, *scutigera*, *brachyurus*, *purpurellus* and *Mexicanus*. Legs well developed (see figure) ; tarsal digitules with very distinct knobs, claw digitules incrassate. (The microscopic figures are by Miss Falk.)



FIG. 7.—Leg of *C. Lahillei*.

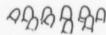


FIG. 8.—Stigmatic spines of *C. Lahillei*.

Hab.—Santa Ana, Argentine (Lahille). The bottle bears this label : "Sta. Ana (Misiones), Llana, No. 10, No. 8 Hem."

The genus *Ceroplastes* is evidently derived from some convex Lecaniid type, and from this point of departure presents a series of forms showing the most curious modifications, coincident with the greater development of wax. Some of the recognizable groups are as follows :

(1.) *C. denudatus* Ckll., of the Lesser Antilles, which is at first a typical *Ceroplastes*, but in age loses nearly all of the wax, and looks like a *Saissetia*.

(2.) Typical *Ceroplastes*, with convex scales, in which the lateral plates are large and reach the lower margin ; caudal horn usually moderate, and

directed posteriorly. I give a figure of *C. Mexicanus* Ckll., showing the scale and the denuded female, the latter with the caudal horn visible.

(3.) *C. ceriferus*, Anderson, and its allies, in which the wax is very thick, and the caudal horn, still directed posteriorly, has become very long, in order to reach the surface. I give a figure of the caudal horn.

(4.) *Ceroplastina*, n. subg.; type *C. Lahillei*. Wax abundant, pushing the plates on to the dorsal surface; caudal horn mammiform, directed upwards. Wax of different individuals often confluent. I give dorsal and lateral views of the waxy scale, and a lateral view of the denuded female. This subgenus may be considered to include other species with a similar female, such as the South American *C. Bergi* Ckll., and the African *C. Africanus* Green, and *C. egbarum* Ckll.

(5.) *Ceroplastidia*, n. subg.; type *C. Bruneri* Ckll. (see figure of denuded female). In this group the wax of the several individuals is thick and always confluent, and the female has become high and narrow. Strictly of this subgenus is *C. candela* Ckll. and King, from Natal.

The occurrence of closely related species of *Ceroplastes* in Africa and South America is noteworthy. These insects are arboreal, and it seems just possible that they have been carried across the ocean on floating trees, the wax serving to protect them from injury. It is perhaps more probable, however, that they are of great antiquity, and have reached the southern lands from the north.

THE ENTOMOLOGICAL COLLECTIONS OF THE LATE DR. JAMES FLETCHER.

The friends of the late Dr. Fletcher and many other Canadian entomologists will be interested to know that the whole of his private collection of insects is now deposited in the Division of Entomology, at the Central Experimental Farm, Ottawa. After his death Mrs. Fletcher asked the Honourable the Minister of Agriculture to accept the collection for the use of the Department, which the Hon. Mr. Fisher was very pleased to do. The collection is of a general character, but is particularly rich in diurnal Lepidoptera, to the study of which Dr. Fletcher paid particular attention. It is being gradually worked into the collections of the Division; and in addition to the mounted specimens, there is a very large amount of material in the shape of many hundreds of unmounted specimens. The addition of this collection to the collections of the Division of Entomology will render them all the more valuable and serviceable in the work of identifying Canadian insects for the many correspondents in different parts of the Dominion, which is one of the many useful functions the Division performs.—(C. G. H.)

DESCRIPTIONS OF NEW SPECIES OF *EUPITHECIA* FROM
EASTERN AMERICA.

BY GEO. W. TAYLOR, NANAIMO, B. C.

1. *Eupithecia Winnata*, n. sp.

Expanse, 25 mm.

This species is about the size of and superficially somewhat like *Eupithecia Youngata*, but the fore wings are longer and more pointed at the apices, the hind margins straighter and the tornos less rounded.

The colour is a rather bright brown.

Palpi short, rather stout. Head gray, with a slight brownish tint, paler between and behind the antennæ.

Thorax and abdomen above the colour of the wings; dorsal line on abdomen indistinctly marked by pale dots on segments; 1st segment pale; no black band on 2nd segment.

Fore wing rather bright brown, the central and submarginal areas a little darker. Basal lines very indistinct. Central area bounded not by lines, but by a lightening of the ground colour of the wing. There are, however, two series of black dashes on the veins, one set representing an intradiscal line and running outwards, and the other set representing the extradiscal line and running inwards. These dashes extend almost across the central area in some cases. Beyond the median band is a paler stripe divided into two by an indistinct brownish line. The submarginal area is broad, bisected by a wavy white line; this line runs in three sharp scallops from costa to vein 6, then in slight waves parallel to hind margin to vein 3, and thence in a conspicuous acute scallop to the tornos. Marginal line black, interrupted. Fringe paler than submarginal area, with darker spots at the ends of the veins. Discal spot small, lengthened, distinct.

Hind wing paler, very light at costa, dark smoky on inner margin. Traces of lines, the most conspicuous being the extradiscal, showing as dots on the veins. A fairly distinct zigzag white submarginal line; marginal line and fringe as on fore wing; outer margin flattened and indented at vein 5; discal spots very indistinct.

Beneath, much paler; discal spots on all wings large and conspicuous; two extradiscal lines, broken into venular spots on all wings; submarginal line on fore wing, faint, slight traces of other lines on hind wing; marginal lines and fringes as above.

March, 1910

Described from three specimens received from Mr. A. F. Winn, and labelled Montreal, 29 V to 3 VI, '05.

The last named specimen remains in my collection, thanks to Mr. Winn, and bears the type label.

Eupithecia grata, n. sp.

This is a very distinct species, and not likely when once seen to be mistaken for any other in our fauna.

Expanse, 25 mm.

Palpi long, rather stout. The whole upper surface pale fuscous, with cross lines of yellowish-brown.

The fore wings are short and wide, with outer margins well rounded.

Basal line evenly curved. Intradiscal much nearer to the basal line than usual, running outward at sharp angle from costa to cell, then back in an even curve to inner margin. Median line broad, distinct, parallel to intradiscal, just missing the faint discal dot by making a sharp angle at cell and running thence to inner margin in a wavy line. Extradiscal line narrow and very finely scalloped through the whole of its length, in general direction parallel to the median, but making a regular curve instead of a right angle at the cell. Submarginal line parallel to the extradiscal and of a like character. A very faint marginal dark line. Fringe long, faintly spotted.

Hind wings dusky. Discal dot round, rather large, but faint. The median and extradiscal lines of fore wing are continued right across the hind wing; no other lines are evident. Outer margin well rounded. Fringe as in fore wing.

Beneath, browner than above, discal spots and extradiscal lines on all wings rather distinctly reproduced. There is also a fainter median line, including the discal dots on each wing, and an indistinct submarginal shade.

The type specimen is in faultless condition, and was taken by Mr. C. H. Young at Ottawa on June 5, 1906, and though unique, has been most generously placed in my cabinet.

Eupithecia Gibsonata, n. sp.

This is a species about the size and shape of *Youngata*, *Winnata* and *Quebecata*, but it seems distinct from all three.

Expanse, 25 mm.

Palpi moderately long, rather heavy. Whole upper surface, soft pale brown with black cross lines. (*Youngata* is fuscous with pale cross lines.)

Fore wings moderately broad, with hind margins well rounded out. (In *Winnata* these margins are very straight and the wings pointed.)

Thorax with a whitish transverse line posteriorly and two minute black dots, one on each side the middle. Abdomen with black band on second segment.

Fore wing: Basal line evenly curved. Intradiscal very sharply angled at cell. Extradiscal curving inwardly from costa, then outwardly at cell, and thence in a series of scallops to inner margin; some black dashes running from this line inwardly on the veins. Crossing the median space are three fine lines, heaviest on the costa. The two outermost are subparallel to the extradiscal, but the innermost is not parallel to either intra- or extradiscal. This line includes a small black discal spot. There is a narrow pale band beyond the extradiscal line, bounded outwardly by an indistinct fine line, exactly parallel to the extradiscal; this space is divided by a similar fine line hardly visible, except on the veins.

The submarginal space is a little darker than the rest of the wing, and is divided by a distinct scalloped pale line. Marginal line fine, broken, but very black and distinct. Fringe moderate, faintly spotted.

Hind wing with the markings of the fore wing faintly continued, the intradiscal of fore wing becoming the basal line on hind wings. The pale extradiscal divided band of fore wing can be traced right across hind wing. Discal dot minute.

Beneath, fore wing lightly scaled, smoky; two median lines and the extradiscal marked on costa, and faintly visible across wing. Extradiscal pale band also tracèable across all wings.

Hind wing a little paler; five cross lines quite distinct, two intra- and three extradiscal. Discal dots distinct.

The markings of the hind wings, both above and below, are very different from *Quebecata*.

Type, a female from Mr. C. H. Young. It is dated Ottawa, 9, VI, 3, and is in perfect condition.

I name this after Mr. Arthur Gibson, who has helped me very much with species of Ottawa Geometridæ.

Eupithecia fasciata, n. sp.

There can be no question but that this species is very closely allied to the *E. bifasciata* of Dyar, described from Kaslo. In fact, Dr. Dyar,

who was good enough to compare a specimen of *fasciata* with the type of *bifasciata*, was of opinion that they belonged to the same species.

But the type of *bifasciata* is not in the best condition, and my own specimens of *bifasciata*, taken in the type locality, seem sufficiently different from the eastern form to warrant the imposition of a new name.

It is hardly to be expected that a species of *Eupithecia* found in B. C. should also be found in Ontario and Massachusetts, and yet be wanting in all intermediate localities, and until specimens are found in such localities, or until by the study of more ample material the differences I rely on are shown to be inconstant, I think the better plan is to give the eastern form a name distinct from the western.

E. bifasciata Dyar, was described (Proc. U. S. Nat. Mus., XXVII, 891) as *Leprocystis* (typographical error for *Tephroclystia*) *bifasciata*. The types were two in number. One taken on June 25 is in the U. S. National Museum, No. 7820, the other taken on June 13 is in Mr. Cockle's collection. I have a specimen exactly similar to this last named, and taken at the same place on May 17.

At a later date Dr. Dyar described *T. harlequinaria* (Proc. Ent. Soc. Wash., VII, p. 29, 1905) from two specimens from Victoria (E. M. Anderson) and one specimen from Seattle (O. D. Johnson). One of the Victoria specimens passed through my hands, and I have no hesitation in saying that it was merely a very brightly coloured, fresh specimen of *bifasciata*.

From these forms *fasciata* may be distinguished by its smaller size and duller coloration, and by the fact that in it the brown patch between veins 3 and 4 of fore wings does not interrupt the double extradiscal line, while in *bifasciata* these lines are obliterated. These differences are, it is true, very slight, but I am of opinion that a longer series of good specimens will show that the two forms are at least distinct geographical races.

E. fasciata may be described in detail as follows :

Expanse, 18 mm.

Palpi moderate. Thorax fuscous, a distinct white spot posteriorly. In *bifasciata* there is also a white median transverse bar on the thorax. There is no such bar visible in my specimens of *fasciata*, but this may possibly be due to their being in poor condition. Abdomen without blackish band on second segment; dorsal tufts black.

Fore wing long, pointed, outer margin not very full, very slightly angled at vein 4, ground colour light brown, with the lines and shadings blackish. Basal area and up to the median line (which runs through prominent black discal spot) blackish, all the lines being indeterminate. Median area, from median line to the extradiscal, clear brown, giving the appearance of a band across the wing. Extradiscal double, straight from costa to vein 8, then at a sharp angle outwards to vein 6, then in a regular curve to vein 1, and thence in a straight line to inner margin. These lines are followed by a narrow pale space. Submarginal area blackish, divided by a very fine wavy submarginal white line, and interrupted between veins 3 and 4 by a brown cloud extending to the margin. Marginal line black. Fringe short, brown, spotted with blackish.

Hind wings pale, except at extreme base. Three or four black extradiscal lines begin on inner margin, but rapidly fade away as they cross the wing. A submarginal darker shade. Discal dots small, round, faint. Fringe as on fore wings.

Beneath, abdomen and legs nearly white. Wings very lightly scaled. Discal spots distinct. On fore wings two extradiscal lines are faintly reflected. On hind wings one basal and three fairly distinct extradiscal lines can be traced from margin to margin.

Described from three specimens. One taken at Ottawa, 28th June, 1906 (Arthur Gibson). This is the one from which the description is mainly drawn. A second specimen was received from Mr. W. D. Kearfott, and was doubtless taken in New Jersey. The third was taken 25th June, 1906, at Winchendon, Mass., and is in the collection of Mr. L. W. Swett.

Eupithecia Quebecata, n. sp.

Expanse, 21 mm.

Thorax, abdomen and fore wings above, bright brown. Basal line black, running at a sharp angle to submedian vein, and then back at a right angle to the inner margin. Intradiscal line exactly parallel to the basal, running from the costa until it almost reaches the discal spot, and then at a right angle to inner margin. Two median fine wavy lines, one running through angle of intradiscal and the other through the black discal spot. Extradiscal line very pronounced, dislocated at subcostal vein, sending out conspicuous black dashes inwardly along the veins. Beyond the extradiscal is a pale space bounded by a dark line parallel to the

extradiscal, and divided by a black hair line. Submarginal space darker than the rest of the wing, and traversed by white zigzag submarginal line. Fringe lighter, with median dark line. Hind wing same shade of brown as fore wing, with many lines, at least two intradiscal and four extradiscal, and a white submarginal evident from margin to margin. Fringe same colour as wing, with darker spots opposite ends of veins.

Beneath lighter; the discals larger than on upper side, and nearly all the markings of upper side reproduced, the extradiscal and submarginal dark lines on all wings being heavy and diffuse. The direction of the intradiscal line on the fore wings above, in its relation to the two median lines, distinguishes this species from all the other species of eastern *Eupithecia* known to me. It is, however, a very near relative to the European *E. sobrinata* Hubner, of which at first I thought it might be a variety. Described from four specimens received from Mr. A. F. Winn, of Montreal, and taken at Biddeford, Maine, 23, VII, '99, and Kamouraski, Quebec, 23 and 26, VIII, '98.

My type labels are on two specimens retained in my own collection, and labelled Biddeford, 23, VII, '99, and Kamouraski, 26, VIII, '98.

Eupithecia fumata, n. sp.

Expanse, 24 mm.

This is one of our large species very near to *E. fumosa* Hulst. It differs from that species in the shortness of the palpi, in the greater fulness of the hind margins of all the wings, in being more heavily scaled beneath, and in having the extradiscal line on the hind wing below finer, and more distant from the discal spot. These (except the palpi) are slight characters, and may not amount to more than varietal differences, but my type specimen is in such perfect condition that I am tempted to name it.

There is no eastern species near to it except what I have identified as *fumosa*. The western *Eupithecia perfusca* Hulst, and its allies, *E. terminata* and *E. Slocanata*, are also near relatives of *fumata*.

Type, one ♀ taken at Ottawa, 9, VI, '06, by Mr. C. H. Young, and in my collection.

Eupithecia indistincta, n. sp.

Expanse, 28 mm.

This is the largest of our eastern species. The wings are longer but narrower than in *E. Packardata*, Taylor (*geminata*, Packard), which species *indistincta* much resembles.

The palpi are very short. The whole upper surface is a dull clay colour, paler than *Packardata*. Abdomen with very conspicuous black band on second segment, and small black dorsal tufts on other segments. The markings on the fore wings as in *Packardata*, but the discals are large and round instead of linear, and the dark spot on the costa, whence the extradiscal line proceeds, is further from the discal spot than it is in that species.

Hind wings as in *Packardata*, save that the discal spots are larger.

Beneath as in *Packardata*, but with the same differences as noted above.

The short palpi will distinguish this species from *fumosa* Hulst.

Types: 1. Catskill Mountains, 10, VIII, '99, Mr. R. F. Pearsall.

2. Sherborn, Mass., 14, VI, 1900, Mr. L. W. Swett.

The first named is in my collection, the second in that of Mr. Swett. I have other specimens taken at Toronto, Ontario (Saunders), and Newark, N. J. (Weidt).

A NOTE ON MR. JACKSON'S SYNOPSIS OF THE GENUS PEMPHIGUS.

BY G. W. KIRKALDY, HONOLULU, HAWAIIAN ISLANDS.

I have recently received a separate of this article, bearing no date, but apparently published during 1908.

As far as the part dealing specially with the Aphidæ is concerned, the contribution seems to be admirable, but the writer displays a lack of knowledge of Hemipterous literature and of the Hemiptera, as soon as he embarks upon speculation on the "derivation of the genus."

Basing my researches on those of Hansen, I have recently divided* the Auchenorrhyncha into two superfamilies, Cicadoidea and Fulgoroidea, fully discussing them. If, as Mr. Jackson asserts, the "Fulgoridæ do not secrete a waxy or flocculent material from abdominal glands, where is this material secreted from in that group? The interposition, moreover, of the Fulgoroidea between the Cercopidæ and the Membracidæ is an old Fieberian misconception, faithfully followed by all subsequent authors except Hansen and myself; it is not *in the least* warranted by the structures or habits of the groups in question.

*Bulls. I and III of the Hawaiian Sugar Planters' Div. Ent., 1906 and 1907. March, 1910

Mr. Jackson's diagram on p. 177 cannot be adopted. The Sternorrhyncha must have branched off from the main Homopterous stem before the latter was differentiated into superfamilies, while the association of the

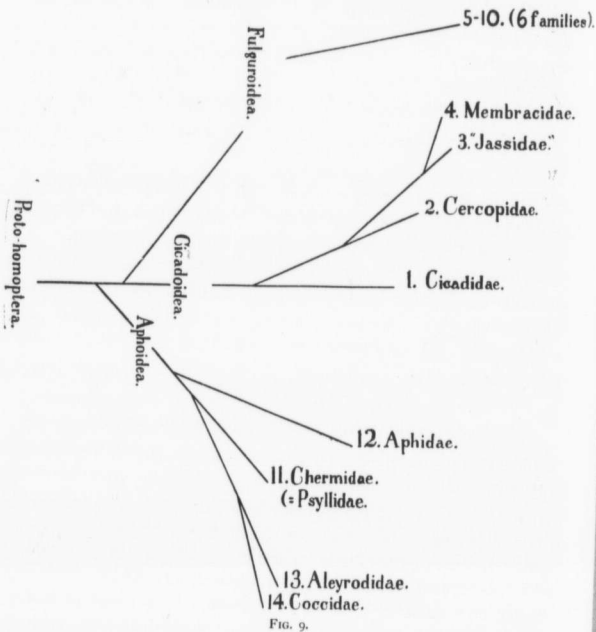


FIG. 9.

Cercopidae and "Fulgoridae" as "twin twigs" of a branch almost equal to the Membracidae or "Jassidae," is positively ridiculous.

The following represents more accurately the course of Homopterous evolution: The Fulgoroidea are much more distinct from the rest of the Auchenorrhyncha than these are among themselves; the Cercopidae, Membracidae and "Jassidae" are all very closely allied, the Membracidae being simply highly specialized "Jassidae."

I have not sufficiently studied the Sternorrhyncha as yet, but I think they form only one superfamily, which may be termed "Aphoidea."

ON SOME NEW SPECIES OF *MESOLEUCA* ALLIED TO
MESOLEUCA HERSILIATA, GUENÉE.

BY GEO. W. TAYLOR, NANAIMO, B. C.

The conspicuous insect described by Guenée as *Cidaria hersiliata* (Spec. Gen., X, 464) is well known to all American collectors of Geometridæ, although it does not appear to be anywhere very plentiful. Guenée's type was from "Canada."

Walker redescribed this moth under the name *Larentia flammifera* (Cat. Lep. Het. Br. Mus., XXIV, 1184). He possessed three specimens, all females, two being from Trenton Falls, New York, and one from Orillia. Walker noted two forms, and Mr. Pearsall (CAN. ENT., XLI, 119) tells us that one form was certainly *hersiliata* of Guenée, but the other, "variety β ," was a distinct species, to which he (Mr. Pearsall) gives the name *M. Walkerata*. I have not myself yet met with *Walkerata*, but have little doubt that it is a good species. At the same time, I am by no means sure that it is Walker's var. β , as the description of that form is altogether too vague, and, moreover, both Packard and Hulst, after an examination of Walker's types, pronounced *flammifera* and *hersiliata* to be synonyms.

Packard, in 1876 (Monograph III, pl. 8, figs. 41, 42), had a larger amount of material, including at least one western specimen. He wrote a description, to include all the forms before him, and made no attempt to separate two species.

Dr. Hulst, in 1896, with still more abundant material, described one form from Nevada as *Mesoleuca ethela*, and another from Colorado as *Philereme formosa*, a very extraordinary generic reference.

All the forms above mentioned I have, I think, made out, except Pearsall's *Walkerata*, but as my eastern material is not very ample, and as Mr. Pearsall says that *Walkerata* is very rare, the exception is not surprising.

Of *hersiliata* (typical) I have specimens from various eastern localities, and also from Manitoba and Calgary. A very beautiful variety from Meech's Lake, near Ottawa (C. H. Young, 24, 6, '04), deserves a name, and I have called it variety *mirandata*. It differs from the type in having the central band quite clear of lines, and of a wine-red colour, instead of being the usual black or gray.

M. formosa is represented in my collection by one specimen only. It very closely resembles the photograph of Hulst's type, kindly given to

March, 1910

me by Mr. Grossbeck. My specimen was bred by Mr. T. N. Willing from a green caterpillar with faint whitish lines, found on currant at Regina. The caterpillar pupated 12th June, 1905, and the moth emerged on the 28th of the same month.

M. ethela, Dr. Hulst's second new species, is a very well marked form, and is perfectly constant. It is distinguished from all the others of the *hersiliata* group by having the space between the basal and intradiscal lines on the fore wings cream-coloured. The contrast between this band and the dark central fascia is very striking, and the moth is a most beautiful one. *M. ethela* was described from Nevada, but all my specimens are from British Columbia.

Beside these forms, I have five others, all from British Columbia. Four of these I consider to be good species, and I will describe them as such. To the fifth I have given a varietal name. They all of them so evidently belong to the *hersiliata* stock that I shall describe them by comparing them with the typical form, which is sufficiently well known.

Mesoleuca occidentata, n. sp.—Expanse, 29–30 mm. This is more like the typical *hersiliata* than any of the species following. The style of coloration is the same, but the slight differences to which I shall call attention seem to be constant.

The outermost of the two basal lines on the fore wings leaves the costa at a sharp angle, so that if it were continued in the same direction as that in which it runs to the subcostal vein, it would cut the hind margin of the wing. The basal area also is much larger, and the two parallel basal lines are more distinct than in *hersiliata*.

The central fascia is not narrowed quite so much below vein 1 as it usually is in *hersiliata*. The rust colour which pervades the submarginal band in *hersiliata* is much reduced in *occidentata*, and the central fascia is of a darker colour in the last-named species.

The hind wing in *occidentata* is comparatively clear, but the discal spot is distinct, and the very heavy extradiscal line of the under side is reflected.

On the under side all the markings on both fore and hind wings are heavier than in *hersiliata*, especially the extradiscal lines, and the space within these lines is darker than that without.

This species is described from seven specimens in my collection, taken at Wellington and Departure Bay, on Vancouver Island, and at Salem, Oregon. The dates are 15th June to 25th July.

I have marked as types a ♂, Wellington, 15, VI, '05, and a ♀, 8, VII, '04.

M. mutata, n. var.—In three specimens of *M. occidentata*, two being from Victoria and one from Wellington, the median band is much narrower, and is lighter centrally than in the seven specimens noted above. The intradiscal lines are connected across the band by dark lines on the veins, forming a series of ringlets below vein 4. The coloured extrabasal bar is narrow and reddish-brown in colour, rather than orange.

Mesoleuca decorata, n. sp.—Expanse, 30–31 mm. This species, though preserving the same style of markings, is more unlike *hersiliata* than the two forms just described.

The characteristic orange bar is in *decorata* reduced to a grayish cloud. The parallel extrabasal lines are more wavy. The central band is wider, and shows two cross lines, one on each side of the discal dot and parallel to the intra- and extradiscal lines respectively. The space enclosed by the two median lines is usually quite clear, though sometimes clouded. The discal dot is small and round, not a dash as in *occidentata*. The submarginal white line is fairly distinct, and the scallops are marked within by coffee-coloured spots, the most evident of which are opposite the discals.

On the hind wings there is a faint discal dot, and an angulated extradiscal dot as in *occidentata*. There is also a very indistinct submarginal scalloped line, with a coffee-coloured shade within it.

Below all wings are slightly tinged with yellowish, and the markings of the upper side are faintly reflected. The discal points are black and distinct. The extradiscal line is distinct on the hind wings, but not nearly so heavy as in *occidentata*.

This seems to be a commoner insect on Vancouver Island than is *occidentata*.

It is described from ten specimens from Victoria, Wellington and Departure Bay, all taken between 3rd and 25th July.

I have placed my type labels on a ♂, Departure Bay, 20, VII, '08, and two ♀'s, Departure Bay, 25, VII, '08.

Mesoleuca boreata, n. sp.—I have two specimens taken near the Stickeen River, in Northern British Columbia by Mr. Theo. Bryant, 24th July, '05, and 25th July, '05.

They are in poor condition, most of the markings being obscured, but the extrabasal bar is quite distinct and perfectly *black* instead of red or yellow. The extradiscal lines on the fore wings above are also distinct, very fine and black. In other respects these specimens resemble the variety *mutata*.

The black extrabasal bar readily distinguishes this form from any other I have seen.

Mesoleuca Castoata, n. sp.—Expanse, 30 mm. Wings longer and narrower than usual in the case of *hersiliata*, and the colouring is duller than in that species.

The extrabasal bar is dull brown, and fills the space between the extrabasal and intradiscal lines. The intra- and extradiscal lines are scalloped, but the scallops are more angular than in *hersiliata*.

The submarginal white scalloped line is very distinct, and is parallel to the margin of the wing throughout almost the whole of its length, not being dislocated below the costa as in *hersiliata* and *occidentata*. A dull brown band precedes this line, and is continuous right across the wing. The margin of the wing beyond the submarginal line is blackish-gray like the central band.

Between the extradiscal line and the submarginal brown band there is a light blotch on the costa, followed by an almost black costal spot and a subapical streak.

This seems to be the form representing *hersiliata* in the Kootenay district. My three specimens are all from Kaslo (Mr. J. W. Cockle). My lightest specimen shows an approach to *M. ethela*, and I suspect it was a specimen of this form that led Dr. Dyar to suggest that possibly *ethela* and *hersiliata* might be found to intergrade.

NOTES ON TENTHREDINOIDEA, WITH DESCRIPTIONS OF NEW SPECIES.

BY S. A. ROHWER, WASHINGTON, D. C.

PAPER IX.—XYELIDÆ AND LYDIDÆ.

North American species of Pteroneura.

- Head and thorax black 1.
 Head and thorax not black 2.
 1. A distinct fovea outside of each lateral ocelli; 1 tr. cu. and 1st recur. n. not interstitial; pronotum black; ♂ (*fulvicornis* Roh.)
 No fovea outside of the lateral ocelli; the 1st recur. n. and 1st tr. cu. interstitial; pronotum lined with white; ♀ (*bruneicornis* Roh.)

March, 1910

2. Postocellar line strongly present; anterior lobe mesonotum punctured as side lobes; length, 4.5 mm.; not marked with black. . . . *lutea* Roh.
 Postocellar line absent; anterior lobe of mesonotum more closely sculptured than side lobes; length, 6 mm.; thorax above and abdomen above marked with black. *Koebelei* Roh.

Pleroneura fulvicornis, n. sp.—♂. Length, 5 mm. Anterior margin of clypeus with a broad obtuse triangular tooth; malar space very narrow; narrow, deep furrows from the antennæ to above anterior ocellus, where they meet; middle fovea elliptic, with a shallow depression to anterior ocellus; a fovea at the side of each lateral ocellus; apical antennal joint shorter than preceding; head and thorax opaque, with close, fine punctures; maxillary palpi very large, 7-jointed, the second joint about the same length as the anterior femora, the first joint about one-third as long as the second, the last five joints smaller and not so rigid; labial palpi 4-jointed; tarsal claws as in *Xyela*, with a small tooth at base; hypopygidium rectangular, the apex almost truncate; intercostal nervure about the length of the same nervure in *Neurotoma fasciata*, but the free part of sc_2 is present; first recurrent n. in second cubital quite free from first tr. cu.; hind wings as in *Neurotoma fasciata*. Colour black; antennæ, clypeus, labrum, tegulæ, legs, venter and palpi rufo-fulvous; wings yellowish hyaline, iridescent; venation pale brown.

Type locality: Placer Co., Calif. One ♂, June. Type, Cat. No. 12749, U. S. N. M.

Pleroneura brunicornis, n. sp.—♀. Total length, 5.75 mm.; length of ovipositor, 1.5 mm. Anterior margin of clypeus truncate, with a small triangular tooth in the middle; antennal furrows meeting above the anterior ocellus, as in *fulvicornis*, but above the middle of the head they are indistinct; no fovea at side of lateral ocelli; palpi as in *fulvicornis*; head opaque, closely granular or finely punctured; thorax above subshining, with distinctly separate, small punctures; sheath about as long as the abdomen, gradually tapering to apex, but more strongly so below; legs as in *fulvicornis*; wings as in *fulvicornis*, except the first recurrent is interstitial with first tr. cu. Black; mandibles, line on pronotum and tegulæ pallid; clypeus, labrum, palpi, legs, venter and three apical segments rufo-fulvous; hind tibiæ infuscated; wings hyaline iridescent; venation pale brown.

Type locality: Gloversville, N. Y. One ♀, April 30, 1907. C. P. Alexander.

Type, No. 12750, U. S. N. M.

Differs from *fulvicornis* in absence of fovea, by lateral ocelli; venation, tooth on clypeus and other characters.

Pleroneura Koebelei, n. sp.—♂. Length, 6 mm. Anterior margin of the clypeus rounded in the middle, with a small obtuse tooth; antennal furrows deep, meeting above the ocellus on a line between the lateral ocelli; postocellar furrow not present; lateral furrows of the postocellar area shallow; middle fovea shallow, elongate; palpi as in *fulvicornis*; head opaque, with fine punctures; middle lobe of the mesonotum more closely sculptured than the lateral lobes, which have separate punctures; claws with a small tooth at base and a long seta at apex; venation nearly as in *fulvicornis*; hypopygidium about as wide as long, at the apex nearly truncate. Colour reddish-brown; middle lobe of mesonotum, scutellum, metathorax above, dorsulum, except three apical segment, black. Wings yellowish-hyaline, iridescent; venation pale reddish-brown.

Type locality: Oregon. Koebele.

Type, No. 12752, U. S. N. M.

Pleroneura lutea, n. sp.—♂. Length, 4.5 mm. Anterior margin of the clypeus truncate, the sides rounded and an obtuse tooth in the middle; antennal furrows narrow and deep, meeting on the postocellar furrow, which furrow is distinct; postocellar area indistinct and parted in the middle by a faint furrow; head and thorax opaque, with fine punctures, which are uniform; claws and venation as in *Koebelei*; hypopygidium slightly narrowing toward the apex, which is nearly truncate. Head, antennæ and thorax reddish-luteous; clypeus, labrum, legs and abdomen luteous; wings glassy-hyaline, iridescent; venation luteous.

Type locality: Oregon. Koebele.

Type, No. 12751, U. S. N. M.

Nearest to *P. Koebelei*.

Cephaleia fulviceps, n. sp.—♀. Length, 11.5 mm. Anterior margin of clypeus slightly notched in the middle, the clypeus sculptured like the front; no fovea on the head, and the lateral boundaries of postocellar area faint; front closely punctured; vertex and posterior orbits sparsely punctured; antennæ 26-jointed, third joint subequal with 4 and 5; mesonotum and scutellum shining, with close, fair-sized punctures on all the sutures; scutellar appendage finely granular; legs normal for genus; abdomen with a velvety appearance, due to the close reticulation; venation like *Cephaleis abietis* (fig. 42, pl. XXVI, No. 1438, P. U. S. Nat.

Mus.), except that the tr. rad. is interstitial with 2nd tr. cu. Colour black; head fulvous, except a black spot enclosing the ocelli and extending down to the antennæ; wings dark brown, iridescent; venation brown.

Type locality: Atlantic Co., N. J.

Type, No. 12753, U. S. N. M.

Allied to *C. frontalis* (Westw.), but is smaller, the pronotum is black, the puncturing of mesonotum different.

Cenolyda Nortoni, n. sp.—♀. Length, 9.75 mm. Anterior margin of clypeus broadly produced in the middle, the middle portion of clypeus gently convex; head, except outer part of antennal fovea, with shallow, separate punctures; orbital carinæ as in *Itycorsia*; middle fovea wanting; lateral postocellar furrows converging to occiput, no middle longitudinal furrow; antennæ about 28 jointed, third subequal to 4 + 5; labrum subquadrate, the apical middle with a long tooth; middle lobe of mesonotum and scutellum shining, impunctate; lateral lobes of mesonotum and pleuræ with widely separate punctures; legs normal; venation differs from *Cenolyda* (fig. 38, pl. XXV, P. U. S. N. M., 1906, XXIX), in a little longer 3rd cub., and the tr. rad. is interstitial with the 2nd tr. cu.; abdomen finely granular; last ventral abdominal segment broader than long, the apex at the sides rounded. Colour dark reddish-brown; lower part of pleuræ, pectus and a few ill-defined spots on thorax above piceous; postocellar spots, cheeks and antennæ yellowish; wings hyaline, glassy, veins dull brown.

Type locality: Maine.

Type, No. 12776, U. S. N. M.

I am not sure what this species is related to. In colour it is like *Pamphilus apicalis*, Westw., but that species is *Lyda* sens strict.

Itycorsia Kincaidi, n. sp.—*Itycorsia margiventris* (Cress.) Kincaid, P. Wash. Acad. Sc., II, p. 344, 1900.

♀. Length, 10 mm. Anterior margin of clypeus straight; entire head, including clypeus, densely punctured, more closely and finely so on the front; a very small elongate middle fovea; only the lateral postocellar furrows present; mesonotum and scutellum shining, the middle area with punctures; mesopleuræ punctured similar to the head; antennæ about 30-jointed, third joint equal to 4 + 5; abdomen opaque, with close tessellation; apical ventral segment of the abdomen broader than long, the apex semicircular; labrum at apex truncate; venation nearly like *Lyda erythrocephalia* (fig. 37, pl. XXV, P. U. S. N. M., XXIX, No. 1438), but

differs in the ba. joining the cu., as in *Cephaleia*. Colour black; anterior margin and middle of clypeus, spot on lower inner orbits, spot at summit of eyes, forked spot above the antennæ, posterior orbits and occiput, usual postocellar spots, entire margin of prothorax, anterior lobe of mesonotum posteriorly, spot on scutellum, spot on side of lateral mesonotal lobes, broad oblique line on the pleuræ, narrow lateral margin of abdomen, *pallid*: legs black; tibiæ and tarsi rufo-ferruginous. Wings dusky hyaline, iridescent; venation fuscous. Head and thorax with long, black hair. Mandibles piceous.

Type locality: Sitka, Alaska, June 16, 1899. (T. Kincaid.)

Type, No. 12761, U. S. N. M.

This is the species recorded as *Itycorsia margiventris*, by Kincaid (P. Wash. Ac. Sci., II, p. 344, 1900), but *margiventris* is *Lyda* sensu strictiore according to Dr. MacGillivray, who has seen the type. *I. Kincaidi* also differs from *L. margiventris* in the colour of the legs and the pale spot on the pleuræ.

Itycorsia nivea, n. sp.—♀. Length, 10 mm. Anterior margin of clypeus semicircular, the surface of clypeus shining, with large separate punctures; head, except a shining, impunctate spot on lower inner orbits, closely punctured, those on the vertex larger and more separate; middle fovea elongate, but not strong; only the lateral postocellar furrows present; antennæ long, slender, about 30-jointed, the third subequal to the fourth and fifth; mesonotum with large separate punctures (in an area above the tegulæ they are wanting); mesopleuræ striato-punctate; abdomen as *Kincaidi*; wings in poor condition, the basal joins the cu., as in *Kincaidi*. Labrum shining, rounded at the apex. Colour as *Kincaidi*, except as follows: The antennæ are reddish-yellow, the lateral markings of the mesonotum are connected to the anterior one, the coxæ beneath are white, and the legs below femora are paler. Wings hyaline, venation pale brown. Mandibles, except piceous apex, yellow.

Type locality: Kokanee Mts., British Columbia; alt. 9,000 ft.; Aug. 10, 1903. (A. N. Caudell.) "Collected upon snow."

Type, No. 12762, U. S. N. M.

Closely allied to *I. Kincaidi* Roh., but the labrum is rounded at the apex, there is a shining area on lower inner orbits, and the antennæ are pale.

Itycorsia luteopicta, n. sp.—♀. Length, 12 mm. Anterior margin of clypeus truncate, the sides subparallel, the angles obtusely rounded,

surface shining, sparsely punctured; antennæ about 35-jointed, 3 subequal to 4 + 5; head shining, polished, with shallow, widely-separate punctures; a large impunctate spot on the lower inner orbits; middle fovea deep, spear-shape, with the long point above; lateral postocellar furrows distinct, converging to the occiput, postocellar area parted by a longitudinal furrow; anterior lobe of mesonotum and scutel impunctate; prothorax, lateral lobes of mesonotum and pleuræ punctured like vertex; laterally the pronotum has a large hump; legs normal; venation as in *I. Kincaidi* Roh.; abdomen finely reticulate; last ventral segment of the abdomen almost as long as wide, the apex gently rounded. Colour reddish-brown; clypeus, labrum, mandibles, smooth inner orbital area, posterior orbits, four longitudinal lines on vertex, anterior lobe of mesonotum, scutel, part of lateral lobes, pleuræ and abdomen straw-yellow; antennæ and legs darker than body, partly brown. Wings hyaline, venation brown.

Type locality: Minn. Collection of W. H. Ashmead.

Type, No. 12763, U. S. N. M.

This species is allied to *I. brunnicans* (Nort.), but the scape is shorter, the last ventral segment is nearly as long as wide (not half as long as wide as in *brunnicans* Nort.), the labrum has a long spear-shaped tooth (not broad with the anterior margin triangular, as in *brunnicans*), and the colour is lighter. It is not marked with black, as is *I. ochroceræ* (Nort.).

THE LARCH SAW-FLY (*LYGÆONEMATUS ERICHSONII*, HARTZ.) IN MINNESOTA.

BY A. G. RUGGLES, ST. ANTHONY PARK, MINN.

The Larch Saw-fly has become a very serious pest on the tamaracks in northern Minnesota. Reports of damage from several parts of the State came to the Minnesota Entomologist's office during the fall of 1909. The writer, in July, examined the damage that had been done to the tamaracks in the State preserve of Itasca Park. This park, a primeval forest of fifty square miles, contains within its borders Lake Itasca, the source of the Mississippi. Attention was first attracted to the great amount of timber, dying or dead, in the swamp regions around the shores of the lake. At first it was thought that the trees were being killed by an excess of water, but upon closer examination it was proved beyond a doubt that *L. Erichsonii* was the cause. The moss under any of these trees, on being turned over, revealed many thousands of cocoons. Under absolutely dead trees only empty cocoons were found, but under trees

March, 1910

showing some sign of life, both empty cocoons and those containing living saw-fly larvæ were taken. The extent of the area infested by this insect was shown by the failure to find a single tamarack tree in this park, on high or low ground, under which, covered by the moss, were not some of the caterpillars in their cocoons. To be sure, the park is not very large; nevertheless, it shows something of the distribution of the insect. Other considerable areas east and north of the park show a like distribution.

At the time of arrival in the park, July 20th, the saw-fly larvæ were all mature. A few days afterward they had disappeared. On going through the woods and over the swamps one could find thousands of dead larvæ, drowned in little pools of water under the trees. Brook trout (*Salvelinus fontinalis*, Mitch.) caught in a small brook which runs through one corner of the park, always looked very plump, and upon examination their stomachs proved to be gorged with saw-fly larvæ.

Many cocoons were collected, and by next year it should be known whether many or any species of parasites destructive to this pest are at work.

TWENTY-SECOND ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.

The twenty-second annual meeting of the American Association of Economic Entomologists was held at the Harvard Medical School (Brookline), Boston, Mass., December 28 and 29, 1909. The first session was called to order by President W. E. Britton, of New Haven, Conn., who presided throughout the meeting, and who delivered the annual address on, "The Official Entomologist and the Farmer." The programme was crowded with papers which were of great economic importance to the Entomologist and the Agriculturist, although a few were more technical in character, and dealt with some of the fundamental principles of scientific investigation of entomological matters. A discussion of different methods used in research work was of particular interest, as was also the reports of the progress that is being made in the field and parasite work in New England, for the purpose of controlling the Gypsy and Brown-tail moths. A report by Dr. W. P. Headden, of Colorado, concerning the injury to fruit trees caused by arsenical spraying, and the discussions that followed, brought out many new ideas on this important subject. An exhibit made by the local entomologists and members which was held in

an adjoining room, contained samples of apparatus and breeding devices, as well as insect collections, which added much interest to the meeting. On Tuesday evening the Association and the Entomological Society of America were the guests of the Cambridge Entomological Club, and on Thursday morning the members had the opportunity of witnessing a spraying demonstration at Arlington with high-power sprayers, as the guest of Mr. H. L. Frost.

The attendance at each session numbered over 100 members and visitors, nearly every section of the United States and Canada being represented.

The Association commended the work which is being done to control the Gypsy and Brown-tail moths in New England, endorsed the bill before Congress to provide for the establishment of standards of purity of insecticides and fungicides, and advocated the passage by Congress of a national law to prevent the importation of dangerously injurious insects and fungus diseases from foreign countries.

The report of the Secretary showed that the Association was increasing in membership, and was in good financial condition. The Journal of Economic Entomology, which is the official organ of the Association, was also reported by the business manager to be in a thriving condition.

The following officers were elected for the ensuing year: President, Prof. E. D. Sanderson, Durham, N. H.; First Vice-President, Dr. H. T. Fernald, Amherst, Mass.; Second Vice-President, Prof. P. J. Parrott, Geneva, N. Y.; Secretary, A. F. Burgess, Washington, D. C.

SYNTOMID MOTHS WITH BANANAS.

BY J. WM. COCKLE, KASLO, B. C.

The article on the occurrence of the various forms of *ceramidia*, by Prof. Cockerell, published in the February number of the CANADIAN ENTOMOLOGIST, has suggested to me that many collectors could avail themselves of the opportunity of collecting these beautiful moths if they were aware of the prevalence of them amongst bananas. Besides the capture of the specimen recorded by me in the CANADIAN ENTOMOLOGIST for 1904, I have secured at various times quite a number of cocoons of this genus.

Pupation takes place in the centre of the bunch of bananas, the cocoon being generally attached to the centre stalk. The pupa is enclosed

in a loose web of brown silk, and numbers of them may be found by careful examination of banana stalks. Climatic changes, cold storage and other causes may account for the very few imagoes that are seen; and besides this, the larva is attacked by a Hymenopterous parasite. Of these latter I have secured three specimens at different times. To any one who is interested in securing specimens of these moths, I would suggest the plan of closely examining partially-depleted bunches of bananas when hanging in the fruit stores, especially during the winter months, when other sources for collecting are unavailable, and possibly in some cases the store-keeper may be induced to keep a lookout for the cocoons if a description of them is given him. From my own experience in a small town where only a very limited number of bananas are sold, I am satisfied that quite a large percentage of the bunches of fruit are infested by the larva of these moths.

When specimens are discovered it should be an easy matter to trace through the wholesale houses the original locality from which the fruit was imported. In this way many valuable records may be secured.

I have suggested to Dr. Dyar that as the Kaslo specimen differs from the other known specimens of this genus, a description of it is desirable.

ANOTHER APPEAL FOR EVERES COMYNTAS AND AMYNTULA.

My appeal last year was very kindly taken up by several Canadian entomologists, but mostly in the West. I should be very grateful for more specimens from the Eastern States.

The result of my examination of the specimens from the West leads me to the conclusion that Winnipeg is about the dividing line. I received a few very interesting specimens from Manitoba, and I should be greatly obliged for more material from there, as also from Assiniboia and Saskatchewan. The forms showed a transit from *comyntas* to *amyntula*, differing in some respects from each. I should also be glad if observers could tell me how many broods they have noticed, and whether there is a gap between each or whether they overlap. As far as I can gather at present there seems to be some diversity on this point in different districts.

I gladly take this opportunity of thanking my various correspondents for their kind help.—G. I. BETHUNE-BAKER.

Mailed March 9th, 1910.