

HENRY HERBERT LYMAN, M. A

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The appalling calamity that befell the steamship "Empress of Ireland" in the River St. Lawrence near Father Point shortly after midnight on Friday, May 29th, was acutely brought home to the older members of the Entomological Society of Ontario by the sad tidings that Mr. H. H. Lyman and his wife were among the thousand and more who were lost. For some few days we hoped against hope, but no trace of them has been found and there is not a vestige to show in what manner death came upon them; it seems most probable that they were drowned in their stateroom before they had time to escape. Mr. Lyman was to have sailed a fortnight earlier, but owing to the pressure of business matters he postponed his departure with so sad a result.

Mr. Lyman was born in Montreal on the 21st of December, 1854 and received his early education at the High School and West End Academy. At McGill University he took the Arts Course and proceeded to the degree of B.A. in 1876, winning the Logan medal in Geology and Natural Science, and received his M.A. degree in 1880. On completing his college career he entered his father's firm, Lymans, Clare & Co., wholesale chemists and druggists in Montreal; in 1885 he became a partner in the business, whose name had been changed to Lyman, Sons & Co. On the death of his father he became senior partner and president of Lymans, Limited, which includes the branch house in Toronto. His position in these important concerns manifests his remarkable business capacity and the attention he must have paid to their affairs. The houses are widely known throughout Canada and bear the highest reputation for upright dealing, energy and enterprise.

Though much engrossed with the management of a very large business establishment, which demanded a close attention to innumerable details, Mr. Lyman found time for an active interest in many other things. In 1877 he joined the 5th Battalion of the

Canadian volunteer force (now the Royal Scots of Canada), and rose from Ensign to Major in 1885, retiring with that rank in 1891. He was a life governor of the Montreal General Hospital; Treasurer and Vice-President of the Graduates' Society of McGill University; Fellow of the Royal Geographical Society and of the Royal Colonial Institute; one of the organizers of the Imperial Federation League in Canada and a member of the deputation which waited upon Lord Salisbury's administration in 1886, asking that an Imperial Conference representing the whole British Empire should be summoned. The Conference was held during the following year. He was also a Director of the British and Colonial Press Service. Though little interested in local politics he was an ardent Imperialist and considered that the perpetual unity of the Empire far surpassed in importance all other political questions; he advocated Imperial preferential trade and believed that Canada should bear its share of the burden of Imperial defence.

To turn to a different aspect of his life, the one in which our readers are more interested—we learn that when only eight years of age he began to observe insects and their ways, and when a boy of twelve commenced to form a collection of Lepidoptera, which has now become one of the finest and most extensive in Canada. On Jan. 5th, 1875, Mr. Lyman became a member of the Entomological Society of Ontario by joining the Montreal Branch. At the following meeting he exhibited a case of butterflies from Illinois, following a custom which has always been characteristic of the Montreal meetings. These exhibits usually led to discussions in which Mr. Lyman took an active part and spared no pains in arriving at correct conclusions, studying the original descriptions and at times taking the specimens to the United States or the British Museum for final determination. He would never jump at conclusions but, sparing no time or trouble, would not rest satisfied till certainty was assured.

His first paper was presented at the meeting on Oct. 5th, 1875, being a description of the larva and pupa of *Grapta interrogationis*; this was followed a few months later by a list of Diurnal Lepidoptera taken at Portland, Maine (published in the Can. Ent., XII, pp. 7-9). For nearly ten years he spent his annual summer holiday on the Atlantic Coast, where he added largely to his col-

lections and developed his love for the butterflies which he took great delight in rearing through all their stages. The first article from Mr. Lyman's pen which appeared in the Canadian Entomologist (Volume VI, page 38), is in the form of a letter asking questions about several butterflies found at Portland, Maine. In the same volume (page 158), he described the curiously marked egg of *Gastropacha americana*. From the 19th to the 44th volume, none have been without at least one article from his pen, and he lately expressed his regret that he failed to contribute last year to Vol. XLV. In addition to his articles in this magazine, he wrote several of a more popular character for the Annual Reports of our Society, and contributed a few also to "Entomological News." A list of his more important papers is given below.

The third annual meeting of the Montreal Branch was held at Mr. Lyman's residence on May 7, 1876, at which the minute book records that "he exhibited his fine collection of local and exotic insects." This was the beginning of a long series of gatherings under his hospitable roof; during thirty-seven years a large proportion of the monthly meetings were held there, and were thoroughly enjoyed by the members and occasional visitors from a distance. They were made especially interesting at times by his delightful accounts of visits to scientific gatherings in the United States and Europe as well as in Canada; he would recount the proceedings, often with a good deal of humour, and tell of the eminent men whom he met. In the course of years he gathered together a large collection of books on the Lepidoptera of North America chiefly, and these he was always most kind in lending to his fellow members when they required to consult them.

While interested in everything connected with the Lepidoptera of this continent, he paid little attention to the "Micros," but was always keen to acquire specimens for study and comparison of such genera as *Colias*, *Argynnis*, *Grapta*, *Chionobas*, *Haploa*, *Hyphantria*, *Papaipema*, *Xylina* and *Hepialus*. His papers on these subjects will always be found of value and interest.

On June 5th, 1877, he was elected Vice-President of the Montreal Branch and four years later he became President holding the higher office for two years; in 1888 he again became President and retained the position till 1899.

In 1895 he was elected Vice-President of the parent Society and in 1897 became President, holding this highest place in the Society for the usual term of two years, to the great satisfaction of the members. He rarely missed one of our annual meetings, and as a permanent Director of the Society took an active part in the management of its affairs. His interests, however, were not confined to his native land. Many years ago he joined the American Association for the Advancement of Science and was recently much gratified at being elected a Fellow; he used to say that an amateur who did good work was really more deserving of honour and recognition than a professional Entomologist who received pay for his work. He was also a Fellow of the Entomological Society of America and of the Entomological Society of London, England; an honorary member of the New York Entomological Society and the Cambridge Entomological Club; for some time he was Vice-President of the Natural History Society of Montreal. His last official act was the reading of his report as delegate from our Society to the Royal Society at the meeting in Montreal on Wednesday, May 27, the day before he started on his fatal voyage.

For a long time past Mr. Lyman's friends have been much distressed by his increasing deafness, which of late had almost become total. Conversation with him could only be carried on with the aid of an ear-trumpet or by writing. In spite of this severe disability, he was always bright and cheerful, full of innocent fun and enjoying a harmless joke. He travelled about a great deal, attending scientific meetings and other gatherings, among others the International Congresses of Entomology at Brussels and Oxford, which he seemed to enjoy, though latterly he could not hear a word of the papers and discussions.

The writer and many friends were greatly pleased as well as surprised when he informed us that he was about to be married. Since the death of his mother to whom he paid devoted attention during a long period of weakness and infirmity, he had been living a somewhat lonely life. Two years ago, in March 1912, he was married to a daughter of the Rev. William Kirkby, of New York, formerly rector of Collingwood, Ontario. She attended with her husband the Jubilee meeting of our Society at Guelph last August

and charmed all who had the pleasure of spending any time in her company. It seems inexpressibly sad that our two friends should have had so short a period of happy married life, and have ended their days together in a tragedy so sudden and so awful.

C. J. S. B.

MR. LYMAN'S PUBLISHED PAPERS.

To the Canadian Entomologist he contributed sixty articles, among which the following may be mentioned:—

Notes on *Colias christina*, Vol. XVI, 5.

The North American *Callimorphas*, Vols. XIX, 181, with plate, and XXI, 231.

Can Insects survive freezing? Vols. XXIV, 1, and XXX, 287.

Pamphila manitoba and its varieties, XXIV, 57.

Preparatory stages of *Nemeophila scudderi*, XXV, 248.

Occurrence of *Hepialus thule* at Montreal, XXV, 297 and XXXIX, 397.

The larger species of *Argynnis* and the mystery of their life history, XXVIII, 143.

Preparatory stages of *Erebia epipsodea*, XXVIII, 274.

Life history of *Colias interior*, XXIX, 249.

Life history of *Xylina Bethunei*, XXXIII, 1.

What is a Genus? XXXIV, 187.

New *Gortynas*, XXXVII, 305 (with plate).

A North American Entomologists' Union, XXXVIII, 1.

Type and Typical, XL, 141.

Recent work among the Borers, XL, 249.

Notes on N. A. *Graptas* in the British Museum, XLIII, 418.

The second International Congress of Entomology, XLIV, 370.

In the Annual Reports:—

No. 23, p. 32. A Trip to Mt. Washington.

No. 32, p. 57. Fall Web Worms, with plate of 33 figures.

No. 32, p. 61. Notes on *Danais archippus*.

No. 37, p. 39. A hunt for a borer.

No. 39, p. 145. Life history of *Euchetias oregonensis*.

No. 40, p. 46. Origin and diffusion of Entomological Errors.

In 29th report, p. 17. President's Annual Address delivered on the occasion of the 25th Anniversary of the Montreal Branch.

In Entomological News, Vol. XVIII, p. 420, is an able article on *Thecla calanus* and *T. edwardsii* (with the footnote that it was read before the Ent. Soc. of Ontario at Guelph, July 4, 1907).

In Vol. VII, 172. On occurrence of *Chionobas tarpeia* in North America.

Several short items also appear, including one regarding *Erebia discoidalis* in the first volume, p. 146.

NEW OR LITTLE KNOWN SPECIES OF APHIDIDÆ.

BY JOHN J. DAVIS, BUREAU OF ENTOMOLOGY, WASHINGTON, D. C.

(Continued from p. 173.)

Symdobius albasiphus, n. sp.

This very interesting plant-louse was first taken by the writer on white oak (*Quercus alba*), at Elgin, Illinois, August 30, 1910. The past year (Sept. 10, 1913), the wingless females were found quite common on white oak at Lafayette, Indiana, and October 8, 1913, at the same place, the wingless oviparous females and winged males were observed. In all cases the plant-louse was found on the leaves near the leaf petiole, usually on the under surface of the leaf, and invariably attended by the ant, *Cremastogaster lineolata* Say.* We have found only the apterous forms of the viviparous generation, but Mr. J. T. Monell collected three winged individuals of this species on oak petioles at Mine la Motte, Missouri, June 28, 1890, and our description of this form is taken from these specimens and the notes accompanying them, through the kindness of Mr. Monell. I have recently received an oviparous female of this species from Mr. A. C. Baker, accompanied by the following note: "On white oak, Vienna, Va., Oct. 4, 1912. Ants had built a mud nest over the aphids to protect them. This nest was on the upper side of the leaf, covering nearly half of it." The first, and so far as we are aware, the only published reference to this species is by Dr. Thomas in the Eighth Report of the State Entomologist of Illinois (1879, p. 118), where the apterous females are described as *Lachnus quercifoliae* Fitch, from specimens collected on white oak

*Kindly determined by Dr. W. M. Wheeler.
July, 1914

at Carbondale, Illinois, in August. As will be readily noticed, this is not the species designated *quercifolia* by Fitch.

Although apparently not a typical member of the genus *Symdobius*, the species under consideration seems to best belong there.

Wingless viviparous female:

General colour, dark brown. Head and prothorax brownish yellow to light reddish brown; mesothorax usually concolorous or but slightly darker; metathorax with a dark brown longitudinal area on each side, the remaining areas greenish brown; abdomen dark brown with irregular paler greenish brown areas, apparently due to the pale greenish young within the body; sometimes the metathorax and entire abdomen shining dark brown, almost black. Body sparsely clothed with *Chaitophorus*-like hairs, more prominent at posterior end.

Eyes maroon colour. Antennæ scarcely more than one half the body length; almost naked; segment III longest, and the filament of VI shorter than the basal portion of that segment; only the usual distal sensoria on V and base VI; segment I and II dusky, III and IV pale, with a barely noticeable duskiness at tip, V pale and dusky at tip. VI, base, with the basal half pale, the distal half and all of filament VI blackish (Pl. XVIII, fig. 49). Beak pale yellow, the extreme tip dusky; reaching to the coxæ of the second pair of legs. Two fore pairs of legs whitish, the joints often dusky and the distal half of tarsus blackish; hind pair blackish, excepting the distal half of tibia, which is paler. In life the cornicles are rather conspicuous because of their pure white colour, as though covered with a heavy white pulverulence; quite small, the opening narrow; slightly cone-shaped, and inconspicuous in mounted specimens (Pl. XVIII, fig. 50). Cauda a rather inconspicuous rounded protuberance, pale yellowish and hairy; anal plate bilobed, moderately deeply emarginate and the lobes robust and hairy (Pl. XVIII, fig. 51).

Measurements from six individuals in balsam: Length of body 1.4 to 1.9 mm., average 1.6 mm.; width 0.8 to 1.0, average 0.9 mm.; antenna I, 0.069; II, 0.052; III, 0.191 to 0.278, average 0.234; IV, 0.139 to 0.182, average 0.157; V, 0.157 to 0.191,

average 0.174; VI, base, 0.113 to 0.139, average 0.125; VI, filament, 0.070 to 0.087, average 0.080; total average length 0.891 mm.

Winged viviparous female:

Head (Pl. XVIII, fig. 52) and thorax dark brown to blackish. Abdomen brown with a central longitudinal whitish yellow stripe. Body very sparsely hairy, the tip of abdomen, including cauda and anal plate, more noticeably hairy. Antennæ shorter than body; relative antennal lengths as in the apterous; segment III bearing 7 to 8 rather large circular sensoria in a row, the usual distal ones on V and base VI (Pl. XVIII, fig. 53). Wings hyaline, veins narrow, an almost imperceptible duskiness at tips of veins; terminal branch of media variable, sometimes branching near apex of wing and sometimes nearer to the point where this vein first branches. Cornicles whitish, slightly narrower at tip than at base, about as long as broad and quite inconspicuous in mounted specimens. Cauda broadly rounded and anal plate bilobed as in the apterous form (Pl. XVIII, fig. 54).

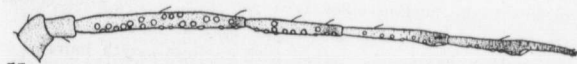
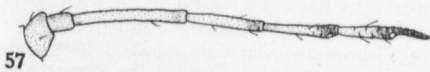
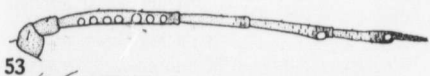
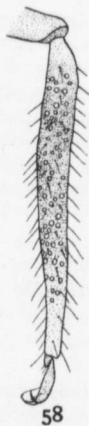
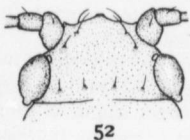
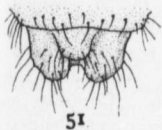
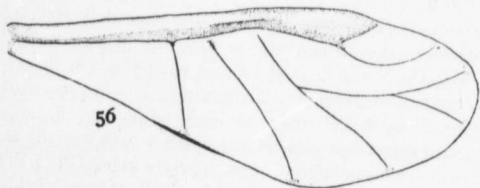
Measurements from three specimens in balsam, the bodies somewhat shrivelled. Average length of body 1.16 mm.; average width 0.57 mm.; length of wings approximately three times their width; antenna I, 0.06; II, 0.05; III, 0.261 to 0.295, average 0.278; IV, 0.156 to 0.174, average 0.165; V, 0.182 to 0.200, average 0.191; VI, base, average 0.122; VI, filament 0.078 to 0.096, average 0.087; average total length 0.953 mm.

Immature:

The young is whitish green with pale olive green markings, as follows: A U-shaped marking the bottom of which extends to and usually includes the first abdominal segment and the top of which reaches the prothoracic segment. A longitudinal area on each side of the abdomen and about in line with the cornicles, but not quite reaching to them. Another marking just posterior to the cornicles. Cornicles white as in the adult.

Winged male:

Head and thorax dark brown to blackish. Abdomen pale pea-green with a dorsal median longitudinal marking and an area



SYMDOBIUS ALBASIPHUS, n. sp.

around each cornicle of a paler green. Body with only a few sparsely-placed hairs.

Eyes dark red. Antennæ a little more than half the body length; relative lengths of segments as in other forms: I and II pale dusky, III, IV, V and base of VI pale with blackish tips, and all of VI filament black; segment III bearing 23 to 30 irregularly-placed circular sensoria, IV with 8 to 13, V with 5 to 9, not including the usual distal one, and VI base with 2 to 4, usually in a row, exclusive of the usual distal ones; sparsely hairy (Pl. XVIII, fig. 55). Fore pair of legs pale, with the tip of tarsus blackish; middle pair similarly coloured, but with the femur dusky towards the tip; hind pair with femur blackish except at base, tibia blackish except towards tip, and apex of tarsus black. Wings as in the winged viviparous female (Pl. XVIII, fig. 56). Cornicles as described for the other forms. Cauda pale green, covered with a rather heavy pulverulence, hairy, and similar in shape to those of the other forms. Anal plate rounded (not bilobed as in the viviparous forms) and hairy.

Measurements from six individuals mounted in balsam, as follows: Length of body 1.32 to 1.82, average 1.51 mm.; width 0.46 to 0.58, average 0.54; length of wing, average 2.28 mm.; width, average 0.82 mm.; antenna I, 0.061; II, 0.054; III, 0.296 to 0.322, average 0.315; IV, 0.174 to 0.217, average 0.197; V, 0.200 to 0.235, average 0.217; VI, base, 0.122 to 0.148, average 0.138; VI, filament 0.087 to 0.104, average 0.092; total average length 1.074.

Wingless oviparous female:

Body mottled with green and black, but to the naked eye it appears to be largely blackish. Head and first two thoracic segments of a light reddish to pinkish tint; remainder of body blackish, with a more or less distinct median dorsal line of pale yellowish green or whitish green, sometimes even with a faint pinkish tint. Laterad of the median paler area are dots of the same colour intermixed with the black; also a pale area around the cornicles. Body moderately sparsely clothed with medium-length hairs as in the wingless viviparous female.

Eyes maroon red. Antennæ approximately one-half the length of the body; relative lengths of segments as in the other

forms; very sparsely hairy; segment I concolorous with head, II pale with a slight duskiness, III, IV, V and base VI pale with blackish tips, VI filament black; sensoria as in the wingless viviparous female (Pl. XVIII, fig. 57). Beak reaching to coxæ of second pair of legs. Fore pair of legs entirely pale, excepting distal end of tarsus; middle pair with femur dusky to blackish except at base; hind pair as the middle pair, but the tibia dusky except at tip; hind tibiæ noticeably swollen and bearing many irregularly placed circular sensoria (Pl. XVIII, fig. 58). Cornicles white as in other forms. Cauda pale with greenish tint, anal plate rounded as in the male.

Measurements from six individuals, as follows: Length of body 1.63 to 2.01, average 1.81 mm.; width 0.96 to 1.12, average 1.04 mm.; antenna I, 0.069; II, 0.060; III, 0.269 to 0.313, average 0.290; IV, 0.148 to 0.200, average 0.179; V, 0.174 to 0.209, average 0.186; VI, base, 0.113 to 0.139, average 0.130; VI, filament 0.070 to 0.090, average 0.078; total average length 0.992 mm.

Egg:

The egg is very pale greenish when first laid, later changing to black.

***Aphis pseudobrassicæ*, n. sp.**

This species was first received by us from Mr. W. J. Schoene, who found occasional specimens on cabbage at Geneva, New York, July 15, 1912. Later in the year (Nov. 20, 1912), a correspondent sent us specimens collected at Evansville, Indiana, with the note that they were abundant on kale and mustard, and that "these same insects have been bothering our turnips and turnip greens, destroying large portions of the patches. It does not bother on spring greens, only on fall crops." In the lot received from Evansville were *Myzus persicæ* and *Aphis pseudobrassicæ* in about equal numbers.

The past fall (September and October, 1913) we have found it at Lafayette, Indiana, abundant on radish and turnip and in the insectary it bred rather freely on rape, although the two former seem to be the preferred host plants. Mr. F. B. Paddock has also found it abundant on turnip at College Station, Texas, and has kindly forwarded specimens to us. No doubt further collections

will show this species to be generally distributed over the country and since it closely resembles *Aphis brassicae* it has likely been mistaken for this species in some instances.

The fact that the winged viviparous female bears sensoria on segment IV. of the antenna, alone separates it from *brassicae*. The sexes have not been found and our present knowledge leads us to believe that the more usual means of passing the winter is as viviparous females.

Wingless viviparous female. (Fig. 21).

Entire body pale whitish green, head slightly dusky. Abdomen with a longitudinal row of impressed dots along each side in

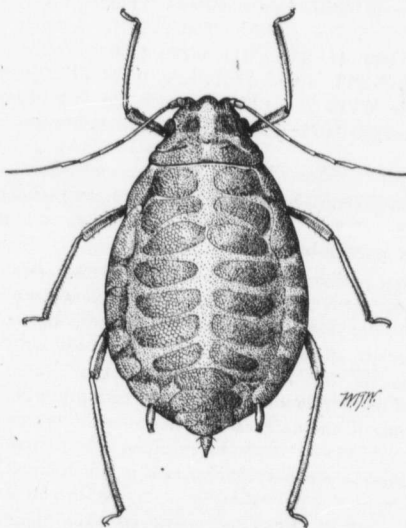


Fig. 21.—*Aphis pseudobrassicae*, wingless viviparous female.

line with the cornicles; also on each side of the median dorsal line is a row of transverse shining areas with a reticulated surface, those on the last four or five segments usually united; and a similar row of smaller areas on each side. These shining reticulated areas contrast with the rest of the body which is dull and very slightly pulverulent. Thoracic segments with similar transverse areas. In specimens just molted the entire body appears shining and reticulated.

Eyes black. Antennae blackish excepting segments I, II and basal half of III which are pale; reaching a little beyond the

line with the cornicles; also on each side of the median dorsal line is a row of transverse shining areas with a reticulated surface, those on the last four or five segments usually united; and a similar row of smaller areas on each side. These shining reticulated areas contrast with the rest of the body which is dull and very slightly pulverulent. Thoracic segments with similar transverse areas. In specimens

middle of the body; segment III longest, it being a half to three fourths longer than VI filament; segments V and VI base with the usual distal sensoria. Beak reaching to coxæ of second pair of legs. Legs pale with dusky joints, the tips of the tibiæ and all of the tarsi black. Cornicles pale with the tip dusky, slightly swollen towards the tip and constricted just before the apex, and noticeably longer than the cornicles of *A. brassicæ*. Cauda conical, and dusky to blackish.

Measurements, as follows (averages from six individuals): Length of body 1.66 mm.; width 1.00 mm.; cornicle 0.226 mm.; cauda 0.140 mm.; antenna I, 0.080; II, 0.061; III, 0.399; IV, 0.202; V, 0.160; VI, base 0.122; VI, filament 0.287; total average length 1.311 mm.

Pupa.

Head dusky, remainder of body cream colour or with a faint greenish tint, and covered with a slight whitish pulverulence, excepting the shining areas which are covered with a noticeable reticulation, and which are placed as follows—a row of oval or transverse areas on each side of the median dorsal line and a row of smaller and more circular ones laterad of these on each side, about in line with the cornicles.

Eyes black. Antennæ pale dusky, the distal ends of segments being more so, relative lengths of segments as in the winged female. Wing pads blackish. Legs pale dusky with the joints, distal end of tibiæ and tarsus blackish. Cornicles dusky, paler at middle, blackish at tips, and similar in shape to those of the wingless female.

Winged viviparous female. (Fig. 22).

Head and thorax black. Abdomen pale apple green with a tint of Nile green and a row of three black spots on each side anterior to the cornicles; a row of small impressed dots on each side dorsad of the larger spots; and in addition a few scattered inconspicuous dusky markings on the dorsum, and the last three segments with black transverse, dorsal median markings.

Eyes black. Antennæ black; almost reaching to base of cornicles; segments III and VI filament subequal; segment III with 19 to 26 moderately tuberculate circular sensoria irregularly placed,

IV with 6 to 10, often more or less in a row, V and VI base with the usual distal sensoria and not infrequently segment V bears one or two near the base (Fig. 22a). Wings with black and rather conspicuous veins, and the terminal branch of the media nearer the

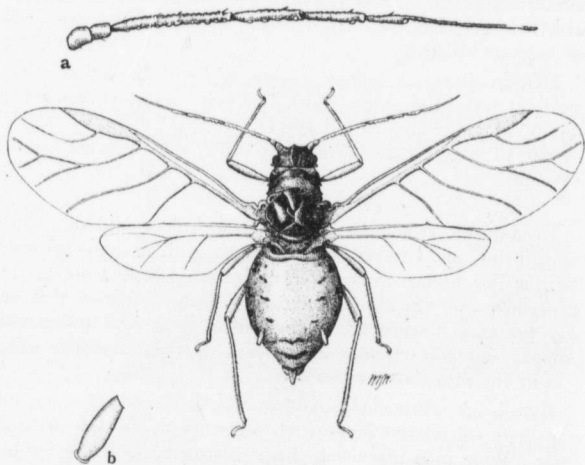


Fig. 22.—*Aphis pseudobrassica*, winged viviparous female; a, antenna of same, enlarged; b, cornicle of same, enlarged.

apex of wing than where it first branches. Legs with femur pale brownish to blackish, tibia pale brownish with tip black and tarsus black. Cornicles dusky, paler at tips, and shaped as in the wingless form (Fig. 22b). Cauda concolorous with the abdomen or paler. Measurements as follows (averages from six individuals): Length of body 1.4 mm.; width of body 0.66 mm.; length of wing 2.4 mm.; width of wing 0.9 mm.; antenna I, 0.069; II, 0.061; III, 0.363; IV, 0.191; V, 0.165; VI, base 0.126; VI, filament 0.358; total average length 1.333 mm.; length of cornicles 0.172 mm.; of cauda 0.134 mm.

Descriptions made from specimens collected on radish, turnip, and rape, at Lafayette, Indiana.

DIRECTIONS FOR SENDING LIVING APHIDS.

It is desirable, in sending aphids for determination, that living individuals be submitted when possible. We have found the following method to be the most satisfactory of several tried:

Place a portion of the plant bearing the aphids in a glass vial and with it a strip of filter paper, the size depending on the size of vial and quantity of foliage placed within it. The vial is then tightly stoppered with a cork and placed in a mailing tube or substantial box for mailing. Always have the stem of the plant and the end of the filter paper sufficiently long so that they will be held by the cork; otherwise the loose foliage and twigs will shake about and may crush the aphids. By this method we have shipped living specimens 1,700 miles and had them reach their destination in excellent shape. Tin salve boxes also make excellent shipping boxes for living aphids. Shipments of this nature should always be accompanied by full data, such as name of food plant, locality, date, part of plant affected, and collector.

All of the illustrations in this paper are by Dr. Henry Fox, excepting figures 10, 21, and 22, which are by Mr. W. R. Walton and figures 43 and 45 to 48 inclusive of plate VII and all of plate XVIII, which are the author's.

EXPLANATION OF PLATES.

Plate II. *Macrosiphum creelii* n. sp.—Figure 1 antenna, and 2 cornicle of wingless viviparous female; 3 head and 4 antenna of winged viviparous female.

Macrosiphum coryli n. sp.—5 head, 6 antenna and 7 cauda of wingless viviparous female; 8 antenna, 9 wing, and 10 cornicle of winged viviparous female.

Plate IV. *Macrosiphum venæfusæ* n. sp.—11 head, 12 antenna and 13 cauda of wingless viviparous female, 14 head, 15 antenna, 16 wing, and 17 cornicle of winged viviparous female; 18 antenna of winged male; 19 antenna and 20 hind tibia of wingless oviparous female.

Plate V. *Macrosiphum tiliæ* Monell.—21 head, 22 antenna and 23 cornicle of wingless viviparous female; 24 antenna of winged male; 25 hind tibia of wingless oviparous female.

Myzus lycopersici Clarke.—26 antenna of wingless viviparous female; 27 antenna, 28 head, 29 cornicle and 30 cauda of winged viviparous female; 31 antenna of winged male; 32 antenna of oviparous female.

Plate VII. *Myzus lycopersici* Clarke.—33 hind tibia of wingless oviparous female.

Rhopalosiphum howardii Wilson.—34 antenna of wingless viviparous female; 35 head, 36 wing, 37 cornicle, 38 cauda and 39 antenna of winged viviparous female; 40 antenna of winged male.

Eulachnus rileyi Williams.—41 antenna of wingless viviparous female; 42 head, 43 antenna, 44 beak, 45 wing and 46 hind tarsus of winged viviparous female; 47 antenna of winged male, 48 hind tibia of wingless oviparous female.

Plate XVIII. *Symdobius albasiphus* n. sp.—49 antenna, 50 cornicle and 51 cauda and anal plate of wingless viviparous female; 52 head, 53 antenna and 54 cauda and anal plate of winged viviparous female; 55 antenna and 56 wing of winged male; 57 antenna and 58 hind tibia of wingless oviparous female.

REPORT ON A COLLECTION OF JAPANESE CRANE-FLIES (*TIPULIDÆ*, *DIPTERA*).

BY CHARLES P. ALEXANDER, ITHACA, N. Y.

(Continued from p. 211.)

Tipula nipponensis, sp. n.

Head yellowish; thorax yellow with brown stripes; abdomen with the caudal margin of the segments broadly brown; wings variegated gray, brown and hyaline.

Male: Length 12.8 mm.; wing 13.6 mm.; antennæ about 4 mm.

Female: Length 13–14.1 mm.; wing 14.2–15.2 mm.

Male: Palpi brown, the terminal segment very long and pale; frontal prolongation of the head very short and stout, yellowish; antennæ, segments 1 and 2 yellow; flagellar segments with the somewhat enlarged base dark brown, the remainder of each segment dull yellow; front, vertex and occiput dull yellow, the sides of the vertex and the genæ dark brown.

Pronotum pale; mesonotum dull yellow with dark brown stripes, the median one bisected by a pale line, lateral stripes short,

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very close to the median stripe; scutum with the lobes brown; scutellum and postnotum yellowish medially, the sides dark brown, a narrow indistinct median line. Pleura yellowish with brown blotches as follows: On sides of the propleura; a large blotch on the mesoepisternum and mesosternum; a very dark spot on the dorsocephalic angle of the mesepimerum, a dark blotch at the base of the halteres. Halteres paler. Legs, coxæ dull yellow with the base on the outer side tinged with brown; trochanters yellow; femora yellow, the tip brown; tibiæ light brown, tarsi dark brown. Wings with a light gray suffusion, cells C and Sc a little lighter, yellowish; stigma brown; hyaline spots as follows: In front of and beyond the stigma, cell 1st M₂, a large blotch in the end of cell M and a spot in cell 1st A near the end of vein 2nd A; veins Cu and 2nd A narrowly seamed with brownish. Venation (see plate XVI, figure 2).

Abdominal tergites with the basal third yellowish, apical two-thirds brown; pleural line conspicuously dark brown; sternites light yellow, each segment with a narrow, transverse subbasal brown band. Male hypopygium: 9th tergite from above narrow, not nearly as wide as the 8th tergite, its lateral angles rounded, its caudal margin deeply and broadly notched. Pleural appendages from the side (see plate XIX, fig. 2). A more dorsal and ectal fleshy lobe which is directed backward, this lobe cylindrical, tapering, provided with sparse long hairs; entad and ventrad of this lobe is a large bifid appendage whose caudal arm is feebly chitinized, pale, with abundant hairs, the inner or cephalic arm is chitinized, and with strong teeth which approach the caudal margin of the 9th tergite. Penis with the central vesicle large, its convex side directed dorsad, the penis proper, long and slender.

Female.—Almost as in the ♂, the antennæ shorter; ovipositor with the tergal valves much more slender than the high sternal valves.

Holotype, ♂, Tokyo, Japan; April 26, 1912 (Vial 25).

Allotype, ♀, Tokyo, Japan; April 26, 1912 (Vial 25).

Paratype, ♀; Tokyo, Japan; April 26, 1912 (Vial 25).

Tipula serricauda, sp. n.

Head with a brown median stripe; thorax with three brown stripes; abdomen trivittate with brown; female ovipositor with the

sternal valves exceedingly short, tergal valves long, serrated on the outer margin; wings clouded brown, gray and hyaline.

Female.—Length about 23 mm.; wing 18-18.8 mm.

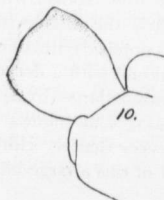
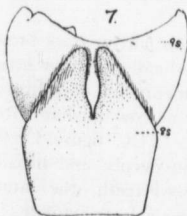
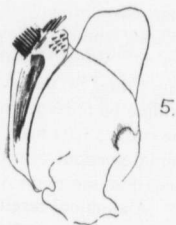
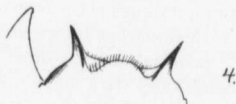
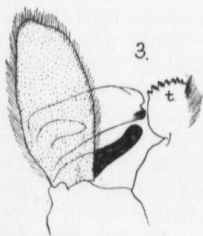
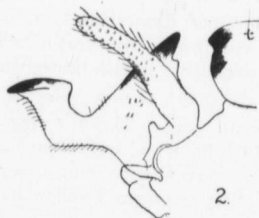
Female.—Palpi with the base dark, the apical segments pale; frontal prolongation of the head rather short, dark above, pale beneath; antennae, four basal segments light yellow, the remaining segments a little brown at the base, yellow apically; front, vertex and occiput dull yellow, the head with an elongate brown median stripe.

Mesonotal praescutum light brown, with three broad dark brown stripes of which the median one is very broad and is bisected by a pale line, lateral stripes close to the median one; scutum dull brownish yellow, the lobes mostly dark brown; scutellum brownish yellow; postnotum light brown, with three dark brown longitudinal stripes. Pleura brown, much darker on the mesosterna. Halteres rather short, dull yellow, the knob a little brown. Legs, coxae with the externo-cephalic face brown; trochanters dull yellow, femora and tibiae yellow, the tips brown; tarsal segment 1 brownish yellow, brown at the tip; segments 2-5 brown. Wings gray, cells C and Sc yellowish brown; dark brown blotches as follows; At base of vein M, in middle of cell M₁ adjoining vein Cu, at origin of Rs, stigmal region including the cephalic portion of the cord. Hyaline blotches scattered over the wing, the largest beyond the stigma, extending obliquely across the wing to cell 1st M₂; a large blotch in cells R and M near the basal third, another in cell M near the tip; others before the stigma and in the anal cells. Venation (see plate XVI, fig. 4).

Abdominal tergites brownish yellow, with three indistinct dark brown longitudinal stripes which extend the length of the abdomen. Ovipositor of a remarkable structure; viewed from beneath (see plate XIX, fig. 6), the sternal valves are remarkably short, not even attaining the base of the upper valves; upper valves parallel on a horizontal plane, slightly curved, the inner margin smooth, the outer margin with numerous saw-like teeth. Sternites dull yellow, a broad brown longitudinal median stripe rather indistinct on segments 1-3 but becoming darker and better defined on the apical segments.

Holotype, ♀, Tokyo, Japan; August, 1912; vial 41.

Paratype, ♀, Tokyo, Japan; August, 1912; vial 41.



JAPANESE CRANE-FLIES.

***Tipula yusou*, sp. n.**

Head and thorax blackish; postnotum blackish; abdomen yellow with three dorsal brown longitudinal lines and one median stripe; wings pale greyish brown variegated with hyaline.

Male: length 15 mm.; wing 19.2 mm.; antennæ 4-5 mm.

Female: length 23 mm.; wing 21 mm.

Male: Palpi and frontal prolongation of the head dark brown, the latter very long; antennæ, segment 1 very long; scapal segments yellow, segment 3 yellow basally darkening into brown at the tip, remaining segments dark brown, the enlarged base even darker, front, vertex and occiput dark brown.

Pronotum dull yellowish brown. Mesonotal præscutum light brown with three darker brown stripes of which the median one is elongate cuneiform, its narrowed point ending just before the suture; scutal lobes dark brown; scutellum dull yellow with an indistinct, narrow darker line; postnotum dark brown. Pleura dark brown. Halteres pale, the stem browner before the knob. Legs, coxæ brown on the outer face, the tips yellow; trochanters yellow; femora yellow, becoming brown at the tip; tibiæ and tarsi brown. Wings, basal half pale yellowish, apical half more brown, cells C and Sc yellowish; stigmal blotch darker brown, irregular; hyaline blotches as follows: a large blotch across the wing before the cord; a narrower one beyond the cord; a large blotch in the caudal portions of cells 1st A and 2nd A; cell M pale in the middle. Venation, see plate XVI, figure 1.

Abdominal tergites 1-7 dull yellow with a narrow dark brown median stripe; segments 3-7 with a shorter and narrower stripe near the lateral margin of each sclerite; segments 8-9 dark brown; sternites dull yellow, also with a distinct, narrow median vitta. Male hypopygium (Lateral aspect, see plate XIX, figure 1): 9th tergite from above, with the caudal margin deeply and broadly rounded, the edge with abundant chitinized teeth, the lateral angles notched; 8th sternite, viewed from the side triangular, the caudal end with a dense bunch of orange coloured hairs; 9th sternite rather large, oval, bearing on its pleural region a group of appendages as follows: the more dorsal a large, fleshy, sigmoid lobe, very densely clothed with long delicate hairs, ventrad and entad of this a large bifid appendage whose caudal branch ends in

a cylindrical chitinized arm, and whose cephalic branch is produced dorsad into a spoon-shaped appendage whose concavity is directed toward the chitinized portion of the 9th tergite; entad of these appendages is a large lobe whose point is chitinized and directed cephalad, the sides with deep parallel grooves. The penis is rather short and very stout; just underneath its tip inside the pleura are a pair of apophyses (shown in the figure), these strongly chitinized and ending in two sharp spines of which the caudal one is the larger.

Female.—Like the ♂, but the dorsal abdominal stripe is much broader, lateral stripes also much broader; on the caudal half of the 7th tergite and on the 8th tergite, all three of the dorsal vittae unite and cover the segment; the sternal vitta is very broad, but is interrupted at the end of the 6th segment; segments 7 and 8 with a small brown median spot near the caudal margin, and the anterior and posterior edges of the sclerite a little darker; genital segment dull yellow.

Holotype, ♂, Tokyo, Japan; May 7, 1912; vial 36.

Allotype, ♀, Tokyo, Japan; April 26, 1912; vial 21.

Paratypes, 2 ♀, Tokyo, Japan; April 23, 1912; vial 3.

The specific name is that of an aboriginal Japanese race formerly occupying the north-west shores of the southern half of Nippon facing the Sea of Japan.

EXPLANATION OF PLATES.

PLATE XI.

- Fig. 1. Wing of *Pachyrhina pullata*, sp. n.
 Fig. 2. " *P. palloris* Coquillett.
 Fig. 3. " *P. repanda*, sp. n.
 Fig. 4. " *P. virgata* Coquillett
 Fig. 5. " *P. flavonota*, sp. n.
 Fig. 6. Dorsal aspect, 9th tergite, of *P. flavonota*, sp. n.; ♂.
 Fig. 7. " " " *P. pullata*, sp. n.; ♂.
 Fig. 8. " " " *P. repanda*, sp. n.; ♂
 Fig. 9. " " " *P. virgata* Coquillett; ♂.
 Fig. 10. Sixth antennal segment, *P. virgata* Coquillett; ♂.
 Fig. 11. " " " *P. repanda*, sp. n.; ♂.
 Fig. 12. " " " *P. pullata*, sp. n.; ♂.

Fig. 13. Pleural appendages, ♂ hypopygium, *P. virgata* Coquillett.

Fig. 14. Pleural appendages, ♂ hypopygium, *P. pullata*, sp. n.

Fig. 15. " " " " *P. flavonota*, sp. n.

Fig. 16. " " " " *P. repanda*, sp. n.

PLATE XVI.

Fig. 1. Wing of *Tipula yusou*, sp. n.

Fig. 2. " *T. nipponensis*, sp. n.

Fig. 3. " *T. aino*, sp. n.

Fig. 4. " *T. serricauda*, sp. n.

Fig. 5. " *T. yamata*, sp. n.

Fig. 6. " *T. insulicola*, sp. n.

Fig. 7. " *T. coquilletti* Enderlein.

Fig. 8. " *Dictenidia fasciata* Coquillett

PLATE XIX.

Fig. 1. Hypopygium of *Tipula yusou*, sp. n.

Lateral aspect; t = 9th tergite; pl = pleura.

Fig. 2. Hypopygium of *T. nipponensis*, sp. n.

Lateral aspect; t = 9th tergite.

Fig. 3. Hypopygium of *T. yamata*, sp. n.

Lateral aspect; t = 9th tergite.

Fig. 4. Hypopygium of *T. aino*, sp. n.

Dorsal aspect of the 9th tergite.

Fig. 5. Hypopygium of *T. aino*, sp. n.

Pleural appendages, lateral aspect.

Fig. 6. Ovipositor of *T. serricauda*, sp. n.

Ventral aspect; t = tergal valve; 5 = sternal valve.

Fig. 7. Hypopygium of *T. coquilletti* End.

Ventral aspect; 8s = 8th sternite; 9s = 9th sternite.

Fig. 8. Hypopygium of *T. coquilletti* End.; 9th tergite from above.

Fig. 9. Hypopygium of *T. coquilletti* End.; pleural appendage from the inside.

Fig. 10. Hypopygium of *T. coquilletti* End.; pleura and its appendage from the outside.

A REVIEW OF THE WORK ON THE POISONED BAIT
SPRAY, DRY METHOD AND MIXED TREATMENT
OF CONTROLLING FRUIT FLIES (TRYPETIDÆ).

BY HENRY H. P. SEVERIN, PH. D., MILWAUKEE, WIS.

As the work on the poisoned bait spray for controlling fruit flies is in its infancy in the United States and beyond the experimental stage in other countries, we have decided to review some of this work in order to set forth some of the methods employed and results obtained. In this paper we shall take up the work of the South African, French, Mexican, United States and Canadian entomologists, and leave the results obtained by the Italian entomologists for a future paper.

It is a well-known fact that fruit flies, after they issue from the pupæ, require 10 days or more before the egg-laying period begins. This interval is a feeding period, and the flies subsist on the nectar of flowers, waxy coating of fruit, juices of injured or cracked fruit hanging on the trees, windfalls, fallen infested fruit and droplets of water. Many fruit-flies show a great fondness for sweets, and one can readily understand why poisoned sweets are so effective in their control. If this poisoned bait is available with the first appearance of the flies on the wing, no doubt large numbers would be killed before the egg-laying period commences.

Mediterranean Fruit Fly (*Ceratitis capitata* Wied.).

Mally (11) of South Africa, apparently unaware of the work of the Italian entomologists started in 1903, began in the season of 1904-5 to spray with poisoned molasses to control the Mediterranean fruit fly, but his experiments were nullified by the scarcity of the flies. Mally's successor, Dewar (4), continued these experiments during the seasons of 1905-7. His results were not conclusive, but they were most encouraging. It was not until the season of 1908-9 that Mally (14) gave a decisive demonstration of the success of the poisoned molasses to combat the Mediterranean fruit fly under South African conditions. "A severe outbreak of the pest in a commercial peach orchard was brought to a sudden and practically complete halt, and the fruit maturing later was marketed under the guarantee of freedom from maggots," while the infestation of the fruit on the control trees increased until practically every fruit was involved.

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Fuller (5) in 1909-10, tested the poisoned bait spray to control the Mediterranean fruit fly, and all trials which were made in several citrus orchards to control this pest were "attended with remarkable effects."

In 1912, Lounsbury (9) demonstrated the applicability of the poisoned bait spray to town conditions. His work was carried on under the most unfavourable weather conditions, for rain fell on 23 of the 33 days of experimentation. The garden in which the experiment was performed contained 15 varieties of fruit, and, the author states, "there is probably no other garden in Pretoria where the fly finds conditions more favourable for its welfare." The windfalls from three untreated trees showed respectively: 95¼, 95¾ and 98¼% of maggoty fruit, against an average of 29% from the treated trees, although the distance between the baited and unbaited ones was only about 150 yards. The fruit picked from sprayed trees showed that 13% was infested, whereas practically every ripe fruit was maggoty on the untreated trees. The author concludes, therefore, that if the spraying is properly carried out the remedy is applicable under town conditions even where the summer rainfall is heavy.

The following formulas were used by these South African entomologists:

TABLE I.

	1904-5	1905-7		1908-9	1912
Molasses (gall.).....	5	7 18	Brown sugar (lb.).....	3 2½	6
Arsenate of lead (lb.).....	1	1 1	Paste arsenate of lead (oz.) ...	4 3	6
Water (gall.).....	25	25 25	Water (gall.).....	5 4	8

The lead arsenate and molasses or brown sugar in all of these formulas were simply dissolved in the required amount of cold water. According to Mally (13), the solution must be kept thoroughly agitated, so that the bait will remain of uniform strength. The spray should be applied so that the minute droplets fall over and through the trees. A pint to a pint-and-a-half is sufficient for a good-sized ten-year-old peach or nectarine tree. Rain will dissolve and wash off the sweet ingredient, and the bait should be renewed as soon as the weather permits. The number of applications of the spray will vary according to local conditions and the season. The first application should be made a month before the presence of the maggots in the fruit is ordinarily expected, and after that an application after the expiration of every

10-14 days is thought advisable. Experience alone will enable us to determine the minimum number of applications necessary to insure good results.

In the Hawaiian Islands we also obtained good results with the use of the poisoned bait spray to control the Mediterranean fruit fly, even though our experiments were conducted under the most unfavourable weather conditions. In our work, Mally's last formula (Table I, 1909), was adopted, but with this difference: Mally used 3 ounces of lead arsenate, and we increased the amount to 5 ounces. To check up the effectiveness of the fruit fly remedy in our work 10 kerosene traps were wired in fruit trees located in different parts of a non-isolated orchard containing about 400 trees. The total number of fruit flies captured in these traps in five weeks was 10,239; of this number 10,203 were males and only 36 were females. With the kerosene traps kept in the same trees, the 400 fruit trees were sprayed about once a week during the following five weeks. The total number of fruit flies captured in the oil traps in five weeks during and after spraying was 182, of which 93 were caught during the first six days. After five applications of the bait, it required a thorough search to find an infested fruit in the orchard, whereas before spraying almost every ripe fruit had been "stung" by the pest.

Melon Fly or Bitter Gourd Fruit Fly (*Dacus cucurbitae* Coq.).

Marsh (15) tested the poisoned bait spray to control the melon fly in the Hawaiian Islands. His baits were prepared by sweetening water with molasses and adding arsenate of lead or Paris green to the solution. The following proportions of the ingredients were used:

Molasses.....	1 qt.
Paris green.....	$\frac{1}{4}$ oz.
Water.....	1 $\frac{1}{2}$ gall.

In the experiment with Paris green the applications were made daily, from September 9 until October 14. "Neither the experiment with arsenate of lead or with Paris green proved effective. The flies were frequently observed feeding on the poisoned liquids, but evidently did not relish them, and so failed to consume a fatal dose."

Fuller (5) stationed in Natal, South Africa, used the poisoned bait spray to control the melon fly. He writes: "Where the treat-

ment has been applied for the melon fly which attacks squashes, marrows, pumpkins and the like, it has proved successful."

We also attempted to control the melon fly with the poisoned bait spray in the Hawaiian Islands. The same formula of the bait which we used to control the Mediterranean fruit fly was adopted to combat the melon fly, except that 1 ounce of a soluble poison, such as potassium arsenate or sodium arsenite, was added to the solution. As the melon fly feeds during the early morning hours the insecticide was applied shortly after sunrise to all of the foliage within a pumpkin patch, and also to the vegetation bordering the same. The results obtained after spraying were rather striking. Before spraying thousands of melon flies could be found resting on the lower surface of the leaves, but several days after spraying only here and there could a specimen be found. In all probability these living flies had recently emerged from puparia, or came in from the feeding grounds or from surrounding cucurbit fields.

A few days after the application of the first spray all of the infested pumpkin vines were pulled out of the ground and raked together in piles. The infested pumpkins were scattered within these piles and then all was burned.

To determine whether the melon flies coming from their feeding grounds or from surrounding fields of cucurbits could be controlled, watermelon seeds were planted in a field adjacent to the former pumpkin patch. The seeds sprouted before we were able to make a vigorous campaign in surrounding cucurbit fields. The watermelon plants were sprayed, but the frequent rains washed off the thin film of sugar and left the plants subject to the attacks of the pests coming from outside sources. As soon as the weather became settled a fresh application of the bait was made to the watermelon plants and surrounding vegetation, but the tender stems of some of the watermelon plants were already infested. Whether the pest, which has been allowed to increase unmolested during the past sixteen years, can be controlled under Hawaiian conditions, when one individual sprays and his neighbours do not, is problematical. In all probability better results could be obtained with the poisoned bait spray in a well-isolated cucurbit field away from the valleys, where rains are less frequent during the summer months.

(To be continued).

NOTES ON THE WINTER AND EARLY SPRING COLEOPTERA OF FLORIDA WITH DESCRIPTIONS OF NEW SPECIES.

BY W. S. BLATCHLEY, INDIANAPOLIS, IND.

(Continued from page 144.)

8196.—**Rhinomacer pilosus** Lec. Originally described from Lake Superior, Virginia and California, this weevil has since been recorded from as far south as Agricultural College, Mississippi. A single specimen was beaten from pine at Dunedin, January 29. In his characterization of the family *Rhinomaceridae* LeConte states that the first joint of the antennæ is "a little stouter than the second but not longer." In the Dunedin specimen it is at least one-half longer.

8205.—**Eugnaptus striatus** Lec. A dozen or more were beaten from oak at Dunedin and Ormond. March 19—April 14.

8223.—**Pterocolus ovatus** Fab. This pretty little weevil was also beaten from oak at Dunedin, Eustis, Sanford and Ormond. March 19—April 14, ten specimens having been secured.

8310.—**Pachnæus distans** Horn. Four examples, taken at Ormond on April 11—14, range from 10 to 14 mm. in length. Horn, in his original description, gives the length as 8 mm.

8340.—**Eudiagogus pulcher** Fab. At Sanford, on January 13, several hundred of this handsome weevil were found hibernating beneath the bark of a pine log which lay by the side of a ditch of running water along the edge of a truck patch. It appears to be a common species throughout the State.

10,814.—**Apion lividum** Smith. Quite common on the dead vines of the wild cucumber (*Melothria*) and in dense masses of Spanish moss at Pelican Bay, Lake Okeechobee. A small reddish-yellow species which at first sight is liable to be taken for an *Anthonomus*.

10,829.—**Hyperodes (Macrops) hornii** Dietz. Beneath boards, along the margins of a shallow fresh-water lake just back of Dunedin, this species and *H. anthracinus* Dietz, were taken in numbers. With them were also several other species of *Listronotus* and *Hyperodes* as yet unidentified. *H. hornii* was also found at Ormond and Lake Istokpoga. January 21—April 14.

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Lixus lupinus sp. nov.

Elongate, cylindrical, robust. Black, shining, evenly and rather thickly clothed with a fine, prostrate, gray pubescence which, on the sides of thorax and elytra, is condensed into a broad, prominent marginal stripe. Beak short (2.3 mm. from eye to tip), stout, cylindrical, coarsely, closely and deeply punctate and with a fine but distinct carina reaching three-fourths to tip. Antennae inserted one-third from tip, the second and third joints of funiculus subequal, the two together slightly longer than the first. Thorax as long as wide, sides parallel from base to middle, thence gradually converging to apex, the latter feebly bisinuate; disc with numerous very coarse shallow punctures, somewhat irregularly placed, their intervals finely reticulate-punctate, without median impressed line but with a broad shallow depression in front of scutellum and a fine carina on apical third! Elytra three times longer than thorax and one-fourth wider at base, sides parallel for three-fourths their length, thence feebly diverging into a rounded apex; disc with a large shallow concavity behind the scutellum and with regular unimpressed rows of rather large distant punctures, their intervals finely granulate-punctate. Abdomen densely pubescent, finely and densely punctate, with numerous scattered very coarse punctures. Length 11—13 mm.; width 3.5—4 mm.

Seven specimens beaten singly from the flowers of the hoary lupine (*Lupinus diffusus* Nutt.) near Dunedin between January 24 and March 18. Resembles *placidus* Lec. but that species has the first and second joints of funiculus equal and the thorax channeled for two-thirds its length. In fresh specimens of *lupinus* the pubescence of beak, thorax and elytra is so dense as to almost conceal the surface sculpture. I had at first thought this a *Cleonus* but as I am unable from the literature to clearly distinguish the differences between *Cleonus* and *Lixus* I sent it to Washington. Mr. Schwarz pronounced it a *Lixus* and wrote: "No one has hitherto been able to point out any generic differences between *Lixus* and *Cleonus* but they differ in habitus and mode of life."

10,845.—**Lixus amplexus** Casey. Quite frequent near Sarasota on the flowers of the large thistle *Carduus horridulus* Pursh. Feb. 13—27.

Lixus leptosomus sp. nov.

Elongate, cylindrical, very slender. Black, shining, very sparsely clothed with fine gray pubescence except along the sides of the thorax and elytra, where it forms a narrow but conspicuous stripe; antennæ and tarsi reddish brown. Beak short, stout, cylindrical, densely and finely reticulate-punctate, feebly carinate. Antennæ inserted at middle of beak, the first joint of funiculus stouter but subequal in length to second which is one-half longer than third. Thorax cylindrical, one-fourth longer than wide, base and apex truncate, disc without smooth median line or basal impression, coarsely and sparsely punctate, the intervals with very fine sparse punctures. Elytra at base not wider than thorax, two and one-third times as long, sides parallel for four-fifths their length, thence gradually converging to a subacute apex; disc with rows of small distant punctures, the intervals very finely and sparsely punctate. Abdomen densely pubescent, finely and sparsely punctate. Length 7 mm.; width 2 mm.

One specimen swept from low herbage along the border of a cypress swamp. Sanford, April 9. The only other described species to which it appears to be closely allied is *L. tenellus* Casey, from which it differs in the relative length of antennal joints, in the beak being densely instead of "extremely sparsely" punctate and in the relatively longer thorax and greater length of body.

11,029.—**Neomastix punctulatus** Dietz. Quite frequent on the flowers of the Ericad, *Andromeda nitida* Bart., at Dunedin, Sanford and Ormond. January 19—April 15.

8684.—**Prionomerus calceatus** Say. One example of this common northern weevil was taken at Lake Istokpoga February 29. I do not find it mentioned in any Florida list.

8719.—**Conotrachelus aratus** Germ. Two specimens were beaten from oak, one at Dunedin, March 28; the other at Sanford, April 4.

8724.—**Conotrachelus belfragei** Lec. Of this, the most handsome of the genus, a single example was beaten from pine at Eustis, April 6th. It was described from one specimen taken in Texas by Belfrage.

8774.—*Acalles ventrosus* Lec. Quite common beneath boards along the margin of fresh-water lakes near Dunedin and Kissimmee. January 18—March 19.

Tyloderma punctata Casey. Very common with the preceding; also at Sarasota and Ormond. Mating in February and March. Very distinct from *T. æreum* Say with which it is usually confounded. A single specimen of the latter was taken at Lake Okeechobee.

8797.—*Cryptorhyncus apiculatus* Gyll. A single example of this rare species was taken at Dunedin January 20; also from the border of a lake.

8821.—*Tachygonus lecontei* Gyll. One of these curious little weevils was beaten from oak at Ormond. April 15.

8826.—*Craponium inæqualis* Say. Quite frequent at Dunedin, Eustis and Ormond. January 23—April 13. Beaten from the wax-myrtle or bayberry

11,110.—*Baris æneomicans* Casey. Frequent at Dunedin; also taken on Sanibel Island and at Kissimmee. Occurs in low moist meadows.

8907.—*Madarellus undulatus* Say. One specimen from Utopia, east shore of Lake Okeechobee. The thorax is much more coarsely punctate than in those from Indiana.

8978.—*Rhodobæus tredecimpunctatus quinquepunctatus* Say. One taken by sweeping at Sanford. April 9. Schwarz records it as occurring on thistle flowers. The elytra are wholly black except a narrow reddish stripe along each side margin. The central spot of thorax is large, fusiform, reaches almost to apex, and in the Sanford specimen unites at base with the two hinder lateral spots which are obliquely merged along the base. It is a distinct southern colour variety, which in my opinion should be kept in the lists.

8983.—*Sphenophorus inæqualis* Say. Single specimens were taken at St. Petersburg and Eustis beneath cover in low damp soil. January 20—April 7.

9002.—*Sphenophorus retusus* Gyll. One at Dunedin. January 16.

11,215.—*Sphenophorus minimus* Hart. One at Dunedin,

February 7. This is quite frequent in low sandy localities in Indiana.

9019.—**Gononotus lutosus** Lec. Eight specimens were found beneath drift along the beach of Clearwater Bay at Dunedin. January 21—February 8.

A NATIONAL COLLECTION OF CANADIAN INSECTS.

The Secretary of State, with the concurrence of the Minister of Agriculture, has appointed the Dominion Entomologist, Dr. C. Gordon Hewitt, Honorary Curator of Entomology in the Canadian National Museum, Ottawa.

For a number of years the Entomological Branch of the Department of Agriculture has been laying the foundation of a representative collection of the insects of Canada. This collection, together with several collections which have been acquired by the Museum, constitute the basis of a National Collection. In it will be incorporated the insects collected and received by the Entomological Branch and by the Museum. As the National Museum is under the direction of the Director of the Geological Survey and Deputy Minister of Mines, increased facilities will be afforded for securing entomological collections made by surveying and exploring parties, for example, the Canadian (Stefansson) Arctic Expedition is collecting insects for the National Collection. The collections will be stored in cabinets similar to those now in use in the United States National Museum at Washington, and it will be a great satisfaction to Canadian entomologists to know that the collections will be housed in a fire-proof building. It is hoped that this important move in the interests of Canadian entomology will receive the support of collectors throughout the country. Collectors having duplicate material will greatly assist in building up the collections by sending such extra specimens of local insects as they may be able to spare for inclusion in the National Collection. Especially is it to be desired that types of Canadian species shall be deposited in the National Museum, where they will be properly cared for.

The Entomological Branch of the Department of Agriculture will continue its practice of naming insects for collectors, and such collections and correspondence relating to the same should be addressed to "The Dominion Entomologist, Ottawa."

AMERICAN TRICHOPTERA—NOTES AND DESCRIPTIONS.

BY NATHAN BANKS, EAST FALLS CHURCH, VA.

(Continued from p. 205.)

Hydropsyche partita, n. sp. (Figs. 58-59.)

Black; head and thorax with grayish white hair; palpi nearly black; antennæ yellow, with spiral black line; abdomen black above, pale beneath; legs pale yellow, anterior femora rather darker. Wings brown, densely irrorate with whitish, nearly all over, the apical part very plainly so, a longer pale mark on hind margin before arculus; hind wings gray, darker on costal tip. Fork 1 longer than pedicel, fork 2 extends a little way on discal cell, fork 3 with short pedicel, median cross-vein its length out on median cell; in hind wing fork 1 is very short, fork 2 a long distance on discal cell; male with eyes wide apart, not enlarged.

Expanse 23 mm.

From Switzer's Camp, San Gabriel Mts., June, Mt. Wilson, 10 Aug., and Pasadena, May, all California (Grinnell); Pecos, New Mexico, July, Aug., and Vineyard, Utah, July (Spalding).

Hydropsyche venularis, n. sp. (Fig. 62.)

Black; head and thorax with whitish hair; palpi very dark; antennæ yellow, annulate with brown; legs pale yellow. Wings pale, the cubitus heavily bordered with dark brown or black, anal also bordered, a large, elongate streak near stigma, sometimes broken by pale spots, a black spot at end of first apical vein, apical part of wing often infusate, elsewhere dark spots, often along veins, and some patches of gray hair, all marks tend to be longitudinal; hind wings gray, tip darker. Eyes of male large, approximate. Venation as in *H. scalaris*. Male superior plate with minute emargination, the second part of lower appendage very short and broad, with bifid tip.

Expanse 22 mm.

From Washington, D. C.; Great Falls, Va.; Dane Co., Wisc.; St. Louis, Mo., June to Sept. I had thought this might be *H. reciproca* (*indecisa*), but that species is near *H. scalaris*.

July, 1914

Hydropsyche slossonæ, var. **recurvata**, n. var. (Fig. 73).

Very similar to *slossonæ* in appearance and structure, the genitalia of male on same plan, the penis having practically the same structure, but the superior plate has only very short processes, instead of the long ones of true *slossonæ*.

From Go Home Bay, Georgian Bay, Ont. (Walker).

Diplectrona californica, n. sp. (Fig. 63).

Head black, with some yellowish hair; palpi brown; antennæ brown, annulate with pale, strongly crenate beneath; legs pale yellowish. Wings brown; quite broad; stigmal area swollen below in both wings, fork 1 but little longer than pedicel, fork 3 longer than pedicel, fork 4 reaching far back, before thyridial cross-vein; in hind wings fork 1 almost reaches to the discal cell, fork 3 hardly longer than 1, in both wings discal cell is over three times as long as broad.

Expanse 10 mm.

From Claremont, Calif. (Baker).

Psychomyia diversa, n. sp. (Fig. 64).

Black; palpi brown; antennæ dark, faintly annulate with pale, black hair on face, brown on warts and some yellowish on front of vertex, thorax with black hair; wings black, especially dark along the costa; no marks, some yellowish hair scattered through the black; femora pale yellowish, in the male, tibia and tarsi dark or nearly black, in the female, pale, and in the female the wings are generally less dark than in the male; male genitalia pale, the upper lateral pieces are longer and not as broad as in *P. canadensis*; in fore wings the tip of the discal cell is oblique and the fork 2 reaches one-half way back on the cell, fork 3 begins beyond fork 4.

Expanse 10 mm.

From Black Mt., north fork of the Swannanoa River, N. Car., May.

Philopotamus.

Fork 1 very short; hind tibiæ not more hairy than rest of legs; tip of female abdomen does not form a long ovipositor. The genitalia of our two species (*distinctus* and *americanus*) are figured.

Dolophilus.

Fork 1 reaches to discal cell; hind tibiae of male very hairy; in female the tip of abdomen forms a long ovipositor; in our species the discal cell is not angulate above.

I have two species of this genus as defined above; the characters used to distinguish the European species from *Philopotamus* do not apply to our forms.

Dolophilus major, n. sp. (Fig. 66).

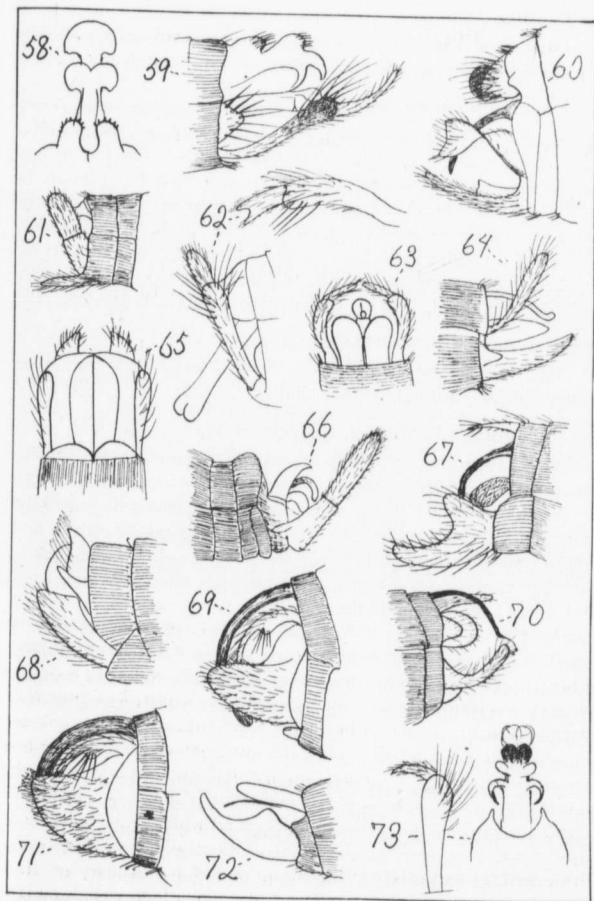
Black, with black and golden-yellow hair; golden hair on front of vertex and base of thorax; palpi brown, antennae dark, annulate with black, coxa and femora rather dark, rest of legs paler; abdomen black; wings black; fore wing beautifully spotted with golden hair, spots rather small, and mostly subequal in size and situate in the cells, each apical cell with four to ten of them, all over wings; hind wings blackish. Wings long, fork 1 reaches to the discal cell, fork 2 is its width on discal cell, fork 4 a little before fork 3, both long, discal cell nearly three times as long as broad; hind wings with forks 1 and 2 very narrow, as long as in the fore wings.

Expanse 22 mm.

From Black Mt., north fork of the Swannanoa River, N. Car., May. I have no female, and its large size seems out of place in this genus, but the genitalia and long fork 1 will not fit in *Philopotamus*.

Dolophilus breviatus, n. sp. (Fig. 61).

Face dark; antennae brown, annulate with yellowish; palpi brown; gray hair between antennae, and on vertex and thorax, a tuft of black hair near each eye; abdomen brownish; legs yellowish, brownish on tarsi; hind tibiae with much long pale hair. Wings dark, densely irrorate with golden, a large golden spot before and one beyond stigma, costal area interrupted once with golden; the golden on wing is so dense a reticulation that the dark appears to be broken into many little rectangles; hind wings gray, blackish at tip. Fork 1 reaches to discal cell in both wings, in fore wings forks 3 and 4 subequal, in hind wing fork 3 is much longer than pedicel; the third joint of maxillary palpi much longer than fourth; in female there is a long yellowish ovipositor.



NEW AMERICAN TRICHOPTERA.

Expanse 12 mm.

From Coy Glen, Ithaca, N. Y., July, and Black Mt., north fork Swannanoa River, N. Car., May.

Plectrocnemia canadensis Bks. (Fig. 37).

My *Polycentropus canadensis* must be referred to *Plectrocnemia*, unless a new genus is made for these small forms. The female has the mid legs with dilated tibia and tarsi, but fork 1 is present in both wings, and discal cell closed in both wings. In fore wings fork 1 is as long as its pedicel, fork 2 back to discal cell, fork 3 with short pedicel, fork 4 back as far as fork 2. In hind wings fork 1 is about as long as pedicel, fork 2 reaches to cell. The male genitalia are figured. It occurs in many places in Eastern States.

Plectrocnemia cinereus Hagen. (Figs. 25, 26).

This is a larger species than *P. canadensis*, but the male genitalia, which are figured, are similar.

Plectrocnemia adironica n. sp. (Fig. 60).

Palpi brownish; antennæ pale, broadly annulate with brown; vertex with gray hair in middle, black hair on sides; whitish hair on thorax; abdomen black above, yellowish beneath, legs pale yellowish. Wings gray, with blackish marks along costa and cubitus; blackish spots at end of veins, yellowish between them, rest of wing with pale brown areas, mostly with yellowish hair; hind wings pale, darker at tip. In fore wings no fork 1, fork 2 reaches a little way on discal; fork 3 with short pedicel, fork 4 hardly longer, not as far back as fork 2, fork 5 broad near base; in hind wings fork 1 is nearly as long as its pedicel, fork 2 back on cell, fork 5 very broad; the male genitalia have a rather long median ventral plate.

Expanse 20 mm.

From Axton, Adirondack Mts., N. Y., 12-22 June (MacGillivray). The absence of fork 1 in the fore wings makes its generic position rather doubtful; if the loss is accidental, it is a *Plectrocnemia*.

Phylocentropus vestitus Hagen. (Fig. 35).

I cannot see any difference in the male genitalia between the large spring specimens and the small autumn specimens, both of

which occur here. I have one specimen in which fork 2 is stalked in all four wings, a very unusual variation, as fork 2 is normally the most constant of all the forks. I figure the male genitalia.

Neureclipsis signatus Banks. (Fig. 72).

My *Polycentropus signatus* belongs to this genus, I figure the male genitalia.

Holocentropus interruptus n. sp. (Fig. 71).

Brown, with white and gray hair; palpi pale yellowish; face with dark brown hair, white hair on vertex and thorax; antennae yellowish, annulate with brown; legs pale yellow. Wings brownish, with many spots and dots of whitish hair, the costal area is interrupted three times with white, a white mark over stigma, beyond are white spots between ends of veins, larger spots on basal middle region, elsewhere mostly small, but often connected, fringe black at ends of the veins, hyaline marks not noticeable. Fork 1 is shorter than pedicel, sometimes only one-half as long, fork 3 is twice as long as its pedicel. Lower appendage of male is broader at base than in *H. flavus*. A slender appendage on each side of body like *Dipletrona*.

Expanse 17 mm.

From Hampton, N.H., June (Shaw); Dane Co., Wisc., July (Vorhies); and Squam Lake, N.H., July (Allen).

Holocentropus orotus n. sp. (Fig. 69).

Palpi brown; antennae yellowish; face blackish, vertex with white hair in middle, black on sides, thorax white haired; abdomen brown, yellowish beneath; legs yellowish, tarsi darker. Wings brown, with some white spots, three in the costal area (one each side of stigma), around the tip are white spots between veins, and a few in middle of wing, but not as numerous as in *H. interruptus*; hind wings gray, with blackish fringe. Fore wings with discal cell about equal to the pedicel, fork 1 very short, fork 3 as long as pedicel, fork 4 reaches only a little before fork 3. Genitalia similar to *H. interruptus*, but the lower appendages are not as broad, and their upper tips are produced inward so that they touch each other.

Expanse 16 mm.

From Clear Creek and Chimney Gulch, Golden, Colo. (Oslar).

Holocentropus longus n. sp. (Figs. 65, 68).

Palpi pale, dark on last joint; face dark, with black bristles above; vertex black with white hair; antennæ yellowish, annulate with brown; thorax with white hair; legs yellowish; wings brown, irregularly spotted with white, four white marks on costal area before stigma, spots between veins on margin, and many elsewhere, often connected; hyaline marks not distinct. The fore wings are longer than usual, fork 5 with sides parallel for most of its length, in type fork 1 is a mere rudiment at margin, but in another specimen (♀) it is longer than pedicel, in this female there is a short fork 1 in one hind wing.

Expanse 20 mm.

From Framingham, Mass., June (Frost), and Digby, Nova Scotia (Russell), June.

Polycentropus centralis n. sp. (Fig. 67).

Palpi yellowish; antennæ pale, annulate with dark; face brown, vertex with yellow hair in middle, black by eyes, thorax with golden hair, abdomen brown above, yellowish below; legs yellow. Wings dark brown, rather densely spotted with patches of yellow hair; anal and cubital veins more heavily black than others; hind wings gray, blackish at tips; fork 1 about as long as pedicel, venation otherwise like *P. confusus*. Size, rather smaller than *P. confusus*, and lower male appendages of different shape.

From St. Louis, Mo., June.

Polycentropus confusus Hagen. (Fig. 70).

This is common in Northern States; the male genitalia are figured.

(To be continued.)

BOOK REVIEWS.

A TEXTBOOK OF MEDICAL ENTOMOLOGY. By Walter Scott Patton, M.B. (Edin.), I.M.S. and Francis William Cragg, M.D. (Edin.), I.M.S., London, Madras and Calcutta, 1913.

The science of medical entomology, although of very recent origin, has developed so rapidly within the past decade and the

literature is scattered through so many periodicals that it has become a difficult matter, even for the specialist, to keep in touch with all that is being written on the subject.

A comprehensive textbook of medical entomology has therefore been urgently needed and the appearance of the monumental work by Captains Patton and Cragg will be welcomed not only by entomologists but also by medical practitioners in tropical lands and by students of protozoology, with which subject medical entomology is so closely associated.

This voluminous work extends over 764 pages and includes no less than 89 full-page illustrations. Its bulk, however, is not the result of diffuseness, for the diction is clear and concise, but of the vast quantity of information it contains. Considering the wide field it covers it is not too large for a useful work of reference.

Perhaps the most striking feature of the book is the large amount of original matter both in the text and the illustrations, which are uniformly excellent. Much space is devoted to the anatomy and physiology of blood-sucking insects, particularly to the structure and mechanism of the mouth-parts, and to the description of methods of breeding and laboratory technique.

The general features of insect anatomy and physiology are illustrated by reference to the Diptera, particularly the various blood-sucking types, a number of which are described in considerable detail, but none of the orders that contain species of interest from the medical standpoint are neglected, each order forming the subject of a chapter of its own, except the Diptera, which include two chapters, in addition to the one in which the anatomy and physiology are treated.

In each chapter the subject is discussed from every standpoint, the anatomy, taxonomy, relation to disease and bionomics, all receiving adequate attention. Valuable information is also given on methods of collecting, dissecting and preserving and each chapter concludes with a careful bibliography. The analytical keys to the genera and species have been taken from the best sources available.

The last two chapters deal respectively with laboratory technique and a general discussion of the relation of Arthropods to their parasites.

Altogether the authors are to be congratulated on the splendid

fruit of their labors, for the work would have been a credit to any country, and is therefore the more remarkable for having been written entirely in India.

EVOLUTION OF THE COLOUR PATTERN IN THE MICROLEPIDOPTEROUS GENUS LITHOCOLLETIS. By Annette Frances Braun. Journ. Acad. Nat. Sci., Phila. (2), XVI, p. 105-168; with 26 text figures and pls. III and IV with 99 coloured figures.

In this work Miss Braun, who is well known to readers of the Canadian Entomologist for her work on the Tineidæ, has made a careful study of the numerous species of the genus *Lithocolletis*, with the object of determining the primitive colour pattern of the genus and the principles involved in its evolution among the various species. The work is based upon a comparative study of the adults of 95 species as well as the development of the pupal wings in 11 representative forms.

The general conclusions arrived at are as follows: The primitive pattern of the fore wing consists of a series of seven pale yellow transverse bands separated by unpigmented areas, the arrangement of the bands having a definite relation to the course of the longitudinal veins. These primitive bands constitute the ground colour of the wings and tend to become broader during both ontogenetic and phylogenetic development, in some species suffusing the entire wing. Dark markings appear only at the limits between the ground colour and the unpigmented areas, but these markings once firmly established in the species become independent of extension of the ground colour.

It is suggested that "the uniform yellowish ground colour which suffuses the wing in the higher Lepidoptera, beginning at the base and spreading distalward, is the outcome of a phylogenetically older type of marking, originally banded, and later fused to a uniform colour, and that the markings are a second series superimposed upon the first." The occurrence in some of the higher Lepidoptera of dark bands in pairs seems to be an indication of their origin on each side of a primitive band of the ground colour, as in *Lithocolletis*.

The work is illustrated by many text-figures and two coloured plates on which the figures of 92 species are grouped in the form of a phylogenetic tree.