

The Canadian Entomologist.

VOL. XXXVI.

LONDON, SEPTEMBER, 1904.

No. 9

THE CRICKETS OF ONTARIO.

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

(Continued from page 188.)

Genus GRYLLUS.

This genus contains the common large black field crickets and the house cricket, which has been introduced into this country from the Old World. But three species have been taken in Ontario. All of these are dimorphic as regards wing-length, the short-winged form being the normal one in the field crickets, the long-winged form in the house cricket.

Key to the Ontario species of *Gryllus*:

- a. Black species, the tegmina and parts of the body sometimes dull reddish-brown; first joint of antennæ not projecting beyond front of head. (Field crickets.)
 - b. Ovipositor nearly or fully half as long again as hind femora, usually exceeding 16 mm. in length; the male stout, with large and broad head.....9. *abbreviatus*.
 - bb. Ovipositor seldom if ever more than 14 mm. or less than 12 mm., rarely more than one-fourth as long again as hind femora; the male more slender with narrower and less swollen head 10. *pennsylvanicus*.
 - aa. Straw-coloured species with some dark brown or blackish markings on head and thorax; first joint of antennæ projecting slightly beyond front of head. (House crickets).....11. *domesticus*.
9. GRYLLUS ABBREVIATUS, Serville. The Common Field Cricket.
Gryllus abbreviatus, Serv., Hist. Nat. des Ins., 1839, 336.
Acheta abbreviata, Harr., Ins. Inj. to Veg., 1862, 152.
Gryllus luctuosus, Serv., Hist. Nat. des Ins., 1839, 335.
Gryllus angustus, Scudd., Journ. Bost. Soc. Nat. Hist., VII., 1862, 427.

This is the common field cricket with which everyone is familiar. It varies greatly in size in Ontario, according to locality, southern specimens averaging much larger than northern ones. The measurements given in the published descriptions of this species are too large for average

specimens from Ontario. Specimens from Point Pelee measure about the same as those from Indiana, according to Blatchley's figures, but those from Toronto, Lake Simcoe and other places further north are distinctly smaller, the smallest average size being found in the North Bay and Northern Muskoka specimens. My smallest specimens are from Lake Simcoe, but I have many from this locality that are nearly as large as those from Point Pelee, and there is a complete series of intermediate sizes. The smaller specimens are sometimes very difficult to distinguish from *G. pennsylvanicus*, especially the males, in which the head is not always broader and more swollen than in that species. In the females the ratio of the length of the hind femora to that of the ovipositor is pretty constant.

The following are measurements of average specimens from the localities given:

	Point Pelee.	Lake Simcoe.	Goderich.	Dwight.	North Bay.
Pronotum	mm. ♂ 4 ♀ 4.3	mm. ♂ 3.5 ♀ 4	mm. ♂ 3.5 ♀ 3.7	mm. ♀ 3.3	mm. ♂ 3.3 ♀ 3.5
Hind Femur . .	mm. ♂ 13 ♀ 13.5	mm. ♂ 13 ♀ 13.5	mm. ♂ 11 ♀ 11.3	mm. ♀ 10.5	mm. ♂ 9.7 ♀ 10.5
Body	mm. ♂ 20 ♀ 21	mm. ♂ 18 ♀ 18.5	mm. ♂ 19.5 ♀ 18.5	mm. ♀ 15	mm. ♂ 16 ♀ 17.5
Ovipositor . . .	19.5 mm.	18 mm.	17.5 mm.	15 mm.	15.5 mm.

Adults begin to appear about the second week in August. My earliest captures are from Point Pelee, Aug. 7, 1901, where I found them fairly numerous under boards and rubbish on the sand. These specimens are all of large size, the ovipositor sometimes more than 20 mm. in length. In September and October they become very numerous and congregate in large numbers under every chunk, log or board, under the loose bark of old stumps, or in burrows in the sand. Late in the season they may be seen in hundreds sunning themselves on fences close to the ground. The eggs are laid in October, and, according to McNeill, in Northern Illinois, hatch in the following July. None of the adults ever survive the winter, the crickets which appear in the spring belonging to another species.

For interesting accounts of the life-history and habits of this insect the reader is referred to McNeill's "List of the Orthoptera of Illinois," in Psyche, VI., 1891, p. 5, and to Blatchley's "Orthoptera of Indiana," p. 436.

Long-winged females of *abbreviatus* are common in Ontario, though far less so than the short-winged individuals. On Aug. 26, 1901, I found considerable numbers of them floating on Lake Huron, off the shore of the Bruce Peninsula. I have never seen a long-winged male.

Localities: Pt. Pelee, Aug. 7, 1901; Arner, Aug. 9, 1901; Rondeau, Sept. 14, 1899; Sarnia, Aug. 15, 1901; Goderich, Aug. 19, 1901; Southampton, Aug. 20, 1901; Bruce Peninsula, Aug. 25-26, 1901; Owen Sound, Aug. 31, 1901; Peterborough Co., Sept., 1903; Toronto, Aug.-Nov.; Lake Simcoe, Aug.-Oct.; Dwight, Muskoka, Aug. 23, 1903; Algonquin Park, Aug., 1902-3; North Bay, Sept. 12, 1900.

10. *GRYLLUS PENNSYLVANICUS*, Burmeister. The Pennsylvania Field Cricket.

Gryllus pennsylvanicus, Burm., Handb. der Ent., II., 1838, 734.

Gryllus luctuosus, McNeill, Psyche, VI., 1891, 4.

Acheta niger, Harr., Ins. inj. to Veg., 1862, 152.

Gryllus neglectus, Scudd., Journ. Bost. Soc. Nat. Hist., VII., 1862, 428.

Measurements: Length of pronotum, ♂ 3 mm., ♀ 3.3 mm.; of hind femur, ♂ 10 mm., ♀ 10.5 mm.; of body, ♂ ♀ 17.5 mm.; of ovipositor, 13.5 mm.

I have often found nymphs of this species in early spring under logs and rubbish, where they have passed the winter. The chirp of the adult is first heard about the third week in May, the last toward the end of July. They are most numerous about midsummer, when the fields and pastures resound with their song. They are very difficult to obtain, however, for they are not gregarious like *G. abbreviatus*, but usually occur in pairs hidden in the rubbish under some thick tuft of grass or weeds, or under the edge of a stone. It requires the utmost care and patience to trace the song to its source, but if this is done successfully, one is often rewarded by finding the female as well as the male.

They are found everywhere in open woods and pastures, and are most abundant on sandy soil.

Blatchley says of this species in Indiana, that "the young hatch in July and August, and after the second or third moult form their winter abiding places, while the adults perish with the coming of the hoarfrost."

It has always appeared to me that the adults disappear long before the summer is over, but this may be an error on my part. The chirping of the males becomes more and more infrequent towards the close of July, and apparently disappears before that of *abbreviatus* begins. None of my female specimens of *Gryllus* taken after July can be referred to *pennsylvanicus*, though some of the males, I confess, I should be unable to place were it not for the dates.

I have only one long-winged female taken at De Grassi Pt., Lake Simcoe, which has, unfortunately, no date attached.

Localities Niagara Glen, June 28, 1903; Hamilton, June, 1893; Toronto, May 23, 1898, June; Lake Simcoe, June-July 30, 1901.

11. *GRYLLUS DOMESTICUS*, Linnaeus. The House Cricket.

Gryllus (Acheta) domesticus, Linnaeus, Syst. Nat. L., 1758, 428.

Gryllus domesticus, Glov., Illust. N. A. Ent., 1872, Pl. VI., fig. 14.

Measurements: Length of pronotum, ♂ ♀ 3 mm.; of hind femur, ♂ 10.5 mm., ♀ 10 mm.; of body, ♂ 20 mm., ♀ 18 mm.; of ovipositor, 11 mm.

Late in the fall of 1903 I heard the chirp of a cricket in the basement of the Toronto General Hospital, but paid little heed to it, thinking it was that of a common field cricket which had entered the building. My attention was again drawn to the sound, however, as it persisted night after night, and I began to notice that it was higher pitched and of less volume than that of the field cricket. I traced the sound to the boiler-room and found, as I had expected, the European house cricket, which I had never before met with in this country. They were there in plenty, lurking in the chinks between the bricks of the wall, and positively swarmed under some loose bricks close to the furnace. They were found in all stages, most of them nearly matured. Imagoes continued to be found throughout the winter, but became scarcer in early spring, and by May had nearly disappeared.

I took one short-winged female. The rest were all long-winged.

The house cricket is said to be found also in the Trinity College building. Both this and the General Hospital are comparatively old buildings.

It has been reported once before from Toronto by Caulfield. (Ann. Rep. Ent. Soc. Ont., XVIII., 1888, 69.)

Sub-family *ECANTHINÆ*.

We have one genus, *Æcanthus*, the species of which are slender, delicate insects of pale greenish or whitish colours, living on trees, shrubs or tall herbs. The males differ considerably from the females in appearance, on account of the great width of the tegmina, which are much broader than the body, while those of the female are narrow and fit closely around the abdomen.

Only three species have been found in Ontario, but there are doubtless others in the south-western part of the Province.

Key to the Ontario species of *Æcanthus* :

- a. Antennæ with but one black mark on each of the two basal joints, black marks in the form of small rounded dots. 12. *niveus*.
- aa. Antennæ either wholly black or with two black marks on each of the two basal joints.
 - b. Head and thorax either black or trifasciate with black or fuscous; antennæ usually black, when pale the marks on the first joint generally connected at apex. 13. *fasciatus*.
 - bb. Wholly pale greenish or yellowish, translucent; marks on the antennæ elongate, parallel, distinct. 14. *quadripunctatus*.

12. *ÆCANTHUS NIVEUS*, De Geer. The Snowy Tree Cricket.

Gryllus niveus, De G., Mem. pour serv. à l'hist des Ins., III., 1773, 522.

Æcanthus niveus, Fitch., Trans. N. Y. State Agric. Soc., XVI., 1856, 404.

Measurements: Length of body, ♂ 10.5 mm., ♀ 11 mm.; of tegmen, ♂ 13.3 mm., ♀ 12.3 mm.; of hind femur, ♂ ♀ 8 mm.; of ovipositor, 4.6 mm.; width of ♂ tegmen, 5.25 mm.

This well-known insect is very common in the cultivated parts of Ontario, where it frequents orchards, vines and shade trees. Its song is the soft rhythmical "treat, treat, treat," which can be heard any evening in late summer or autumn. It is also heard in the day-time in cloudy weather, but at such times is much more subdued.

Of native trees I have found it most partial to butternut, but it occurs on many others. At De Grassi Point, Lake Simcoe, I have often traced the song to the tree from which it came, and it was very often a butternut, but sometimes an elm, maple or other hard wood.

The females are often found on the trunk and lower branches, and are comparatively easily taken, but the males are usually higher up and are quite difficult to obtain.

Niveus is generally held responsible for a great deal of mischief done to raspberry and blackberry canes by the females in laying their eggs. It is my belief that most of this damage, at least in this locality, is caused by the other two species of *Ecanthus*, which abound on raspberry bushes, while *niveus* is seldom, if ever, found upon them. *Niveus* comes to maturity about the first week in August and continues till late in October.

Localities: Leamington, Aug. 7, 1901; Arner, Aug. 9, 1901; Chatham, Aug. 10, 1901; Sarnia, Aug. 12, 1901; Goderich, Aug. 19, 1901; Toronto, Aug.-Oct. 13; Lake Simcoe, Sept. 6-21, 1901.

13. *ECANTHUS FASCIATUS*, Fitch. The Striped Tree Cricket.

Ecanthus fasciatus, Fitch., Trans. N. Y. State Agric. Soc., XVI., 1856, 414.

Ecanthus nigricornis, Walk., Cat. Derm. Salt. Brit. Mus., I., 1869, 93.

Measurements: Length of body, ♂ ♀ 12 mm.; of tegmen, ♂ 11 mm., ♀ 12 mm.; of hind femur, ♂ ♀ 8 mm.; of ovipositor, 5.5 mm.; width of ♂ tegmen, 4.8 mm.

This is by far the commonest tree cricket in Ontario, and during August and September it abounds on shrubs and tall herbs, especially golden-rod, and is particularly plentiful on low grounds. Partially cleared bush lands supporting a rank growth of raspberry bushes, golden-rod, boneset and other tall herbaceous plants are favorite haunts. It is so common on raspberry bushes that there is little doubt that the female is responsible for much damage to the canes, though I have no proof of this assumption. I have found it in cultivated raspberry bushes in gardens, but it is more partial to wild districts.

In shrilling the male elevates the tegmina to nearly a right angle with the body and spreads them to an angle of about 45°. The song is a continuous and rather powerful trill, and is kept up all night and in cloudy weather during the day when the sun is shining. It begins about mid-afternoon.

Localities: Chatham, Aug. 10, 1901; Sarnia, Aug. 12, 1901; Walpole Id., River St. Clair, Aug. 13, 1901; Toronto, Aug.-Sept.; Lake Simcoe, Aug.-Sept.; Goderich, Aug. 19, 1901; Burke Id., Lake Huron, Aug. 27, 1901; Bruce Peninsula, Aug. 23, 24, 1901; Algonquin Park, Aug. 23, 1902; North Bay, Sept. 12, 1900.

14. *Ecanthus quadripunctatus*. The Four-spotted Tree Cricket.

Ecanthus quadripunctatus, Beut., Bull. Amer. Mus. Nat. Hist., VI., 1894, 250.

Ecanthus fasciatus, Hart., Ent. News, III., 1892, 33 (text in part).

Measurements: Length of body, ♂ 9.5 mm., ♀ 11.5 mm.; of tegmen, ♂ 11 mm., ♀ 12 mm.; of hind femur, ♂ 7 mm., ♀ 7.5 mm.; of ovipositor, 5 mm.; width of ♂ tegmen, 4.5 mm.

I believe this form to be merely a pale variety of *Æ. fasciatus*, as I have a series of intergrades and am unable to draw a definite line to separate the two. I have retained the name *quadripunctatus* for the present, however, as I have an insufficient series of typical examples of this form to make a satisfactory comparison between the two varieties.

Quadripunctatus is common in the southern part of the Province, where it is associated with *fasciatus*, but I have never taken typical specimens in the north. Blatchley found it abundant on the north shore of the Niagara River, opposite Buffalo, N. Y.

Localities: Chatham, Aug. 10, 1901; Walpole Id., River St. Clair, Aug. 13, 1901; Toronto, September.

A NEW GENUS AND SPECIES BELONGING TO THE GEOMETRIDÆ.

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

The Geometrid moth described below cannot be placed in any European or American genus known to me, and I therefore venture to institute a new genus for its reception.

The genus belongs to the *Ennominae*, and the absence of a tongue and the possession of the dorsal abdominal tufts serve to separate it readily from all the other American genera of the subfamily, as none of them, I believe, possess these two characters in combination.

As there is some difficulty, especially for a novice, in finding a suitable combination of Greek or Latin which has not already been used as a generic name in some branch of Zoology, I have named this genus after the island opposite to Nanaimo, V. I., where I took specimens of the species last summer. The species I dedicate to my friend Dr. Dyar, who has given me much help and encouragement since I began my study of the Geometridæ.

Gabriola, n. g.—Palpi short, subscending; tongue apparently wanting; front scaled; antennæ ♂ heavily pectinated, pectinations rapidly shortening and leaving apex simple; thorax tufted posteriorly,

loosely scaled; abdomen with dorsal tufts on second, third and fourth segments, the tuft on segment three being the most conspicuous; hind tibiae of ♂ slightly swollen, with all spurs; fore wings with 12 veins, 5 weak, 10 and 11 from cell; hind wings with all veins separate, 5 undeveloped, 8 separate from cell.

Type: G. Dyari.

Gabriola Dyari, n. sp.—Male expands 25 mm. Front, thorax and abdomen gray, with numerous black scales. Thoracic and abdominal tufts tipped with black, a black band on front of thorax and the posterior margins of the abdominal segments are also marked with black scales. Fore wings a warm shade of brown with two very distinct black lines— intra and extra discal. The intra discal line is regularly curved, commencing on the costa at about one-fourth the distance from base to apex, and terminating on inner margin at a little greater distance from base. Extra discal line also very distinct, leaving costa at about two-thirds distance from base to apex, running in a straight line towards central point of hind margin. At vein 5 it turns at right angles and runs in an almost straight line to juncture of veins 3 and 4, thence in a bold inward curve to vein 1, and thence curving in the opposite direction to inner margin. There is an indistinct gray cloud in the middle of the basal area with some scattered black scales. The central area is uniformly brown, peppered with darker scales; no discal dots apparent; outer area brown, with a blackish cloud bordering the extra discal line and becoming a decided blotch on the inner margin. This black cloud is bounded outwardly by a white line, distinct on the costa, then almost obsolete, but reappearing very distinctly below vein 4 and widening, in some specimens, into a large and conspicuous white spot at the inner angle; a marginal row of intervenular black dots. Hind wings paler, with a broad subterminal black shade and an irregular black line across the centre of the wing.

Beneath: the markings of the fore wings are faintly reproduced, but the intra discal line is almost obsolete, and the extra discal, instead of having the double curve as on the upper side, runs in an almost straight line from vein 5 to the inner margin. The lines on the hind wings are also reproduced, the median line being much more distinct than on the upper side, and the subterminal line is broken up into 3 or 4 blotches.

Described from 4 ♂ specimens in my own collection, which were taken in August, 1903. I have seen numerous other specimens, all males, in British Columbian collections, and there are specimens also in the United States National Museum. I have not seen the ♀. The species seems to be not uncommon on Vancouver Island.

THE DIPTERA OF BRITISH COLUMBIA.

Second Part.—The Syrphidæ.

BY RAYMOND C. OSBURN, NEW YORK.

(Continued from page 220.)

43. *Spherophoria micrura*, Osten Sacken.—Two females from Port Renfrew, one July 6, 1901, the other Aug. 16, 1902. The male was taken at Seattle, Wash., July 15, 1901.
44. *Spherophoria sulphuripes* (Thompson).—One male specimen, taken at Glacier, July 20, 1901, belongs here questionably. It lacks the characteristic bunch of yellow pile on the hypopygium of *cylindrica*, but otherwise resembles that species quite closely.
45. *Spherophoria melanosa*, Williston.—A single specimen taken by Harvey at Vancouver, May 30, 1903, agrees quite well with Williston's description, except that the cheeks are brownish instead of shining black.
46. *Sphegina infuscata*, Loew.—Not common. Port Renfrew, July 6, 1901. A specimen from Mr. Harvey, Vancouver, April 12, 1902. Taken at Lowe Inlet by Kincaid, June 3 (Coquillett, 1900). The writer has taken the species also at Laggan, Alberta, Aug. 23, 1902. Two other specimens taken by Harvey, one at Vancouver, March 28, 1903, and one at Wellington, I place here provisionally. They are much larger and darker than the typical form, and may be distinct.
47. *Sphegina lobata*, Loew.—Not common. Port Renfrew, July 3, 1901; Glacier, Aug. 20, 1902. These show no difference from Ohio specimens.
48. *Baccha obscuricornis*, Loew.—A single specimen from Port Renfrew, July, 1901; one specimen from Harvey, Vancouver, May 30, 1903. Taken at Lowe Inlet by Kincaid, June 3 (Coquillett, 1900). A single specimen was taken also by the writer at Seattle, July 15, 1901.
49. *Myiolepta bella*, Williston. A single specimen of this fine species taken at Port Renfrew, June 30, 1901.
50. *Volucella facialis*, Williston.—Taken by Harvey at Vancouver, May 17, 1902, and May 30, 1903. The writer has taken the species at Banff, Alberta, July 17, 1902.

51. *Pyritis montigena*, Hunter.—Taken by Harvey at Vancouver, May 2, 1903, and again at Vernon. A number of specimens, only females. A specimen is in my collection from Victoria also. The species was described in 1895 from a single male specimen taken at Moscow, Idaho. As the female has not, to my knowledge, been described, I indicate here the characters.

Very similar to the male, differing only in the following: Eyes widely separated. Front broadly sulcate transversely, below the sulcus shining; in the sulcus and above brownish pollinose. Face above and on the sides also brownish pollinose. The whole body, head and legs covered with whitish or light yellowish pile; the only black hairs present are those on the eyes and arista.

I have not been able to compare with the male of this species, but the female answers so well to the description that I have little hesitation in describing it here.

52. *Pyritis Kincaidii* (Coquillett)—(*Volucella Kincaidii*, Coquillett, Ent. News, 1895, pp. 131-2.)

Taken by Harvey at Vancouver, Feb. 14, 1901; Feb. 28, 1903; April 12, 1902; also at Vernon, May 2, 1903. Four specimens, two males and two females.

This species is quite close to the preceding. I have been unable to separate them by any marked anatomical characters, and yet they are quite different in appearance. *P. Kincaidii* averages larger than *P. montigena*, yet they intergrade in size. The chief difference to be noted is in the colour of the pile, which in *montigena* is whitish or light yellowish, while in *Kincaidii* it is dark reddish yellow. The females of *Kincaidii* are exactly like the males in this respect, and, in my specimens, show no tendency to intergrade in colour with *P. montigena*.

53. *Sericomyia chalcopyga*, Loew.—A common species at Port Renfrew, on dates ranging from June 30 to Aug. 16. Mr. Harvey has taken the species at Vancouver, April 12 and Oct. 3, and at Wellington, April 17. The writer has taken the species also at Laggan, Alberta, Aug. 24, 1902.

(*Sericomyia militaris*, Walker. Taken at Laggan, Alberta, Aug. 24, 1902, and will undoubtedly be found in Br. Col.)

54. *Arctophila flagrans*, Osten Sacken.—Port Renfrew, Aug. 10, 1902; Glacier, Aug. 20, 1902. A single male specimen taken at each

locality. Snow says (Kan. Univ. Quart., 1895, p. 242): "So far as I know this species is taken only on the summits of mountains of considerable height." My specimen from Port Renfrew was taken on low ground by the sea shore. The species has not previously been recorded so far north, and perhaps this is only another example of the law that mountain species approach the sea level in higher latitudes.

55. *Eristalis tenax* (Linné).—Abundant everywhere. Taken all summer. Port Renfrew, Victoria, Vancouver, and also at Seattle, Wash. Specimens have also been received from Vancouver, Victoria and Wellington, from Mr. Harvey.

56. *Eristalis latifrons*, Loew.—Victoria, July 17, 1901. Taken also at Banff, Alberta, June 17, 1901.

57. *Eristalis montanus*, Williston.—A single specimen, female, taken at Vernon, Sept., 1902, by Harvey.

The eyes are separated about as in the female of *bastardi* or *occidentalis*. The front is reddish-yellow pollinose on the sides like the face; vertex black pilose. The centre of the disk of the thorax has some black pile intermixed with yellow. Otherwise the specimen tallies exactly with Williston's description, and I have no hesitation in placing it here.

58. *Eristalis occidentalis*, Williston.—Apparently a common species. Port Renfrew, Aug. 16, 1901; Victoria, July 20, 1902. Specimens from Harvey, taken at Vancouver, June 21, 1902, and July 20, 1903.

59. *Eristalis flavipes*, Walker.—A single specimen from Harvey, taken at New Westminster.

60. *Eristalis obscurus*, Loew.—Port Renfrew, Aug. 10, 1901; Agassiz, July 18, 1902. Taken by Harvey, Vancouver, July 29, 1902. The writer has taken the species also at Seattle, Wash.

61. *Eristalis hirtus*, Loew.—Two specimens, taken by Harvey at Mt. Cheam, Aug. 5, and another at Vancouver, Aug. 29, 1903.

62. *Helophilus latifrons*, Loew.—One specimen sent me by Harvey, taken at Vernon.

(*Helophilus similis*, Macquart, Banff, Alberta, June 17, 1902.)

63. *Helophilus bilinearis*, Williston.—One specimen at Port Renfrew, July, 1902. Taken also at Seattle, Wash., July 15, 1901. These show no important differences from specimens taken at Fargo, N. Dak.

64. *Helophilus pilosus*, Hunter.—Described in 1897 from Br. Col., one female specimen. No other data given. I have not seen the species.

65. *Pterallastes perfidiosus*, Hunter.—Described in 1897 from two female specimens from Br. Col. No other data given. I have not seen the species.

66. *Triodonta curvipes* (Wiedmann).—A male and female of this peculiar species taken at Victoria, July 20, 1902, are a trifle larger and darker in colour than specimens from the Atlantic coast, but in other respects are similar.

67. *Criorhina Kincaidii*, Coquillett.—Taken by Harvey, at Vancouver, April 9 to May 19, and at Wellington, April 17. In all, 10 specimens of this striking species, nine males and one female, have been sent me by Mr. Harvey. They show considerable variation in colour of the pile of the thorax and abdomen, but otherwise all agree very well with Coquillett's description. The pile of the thorax varies in regard to the extent of the black, which may include all of the hinder part of the mesonotum except the angles, and all of the scutellum except a fringe of yellow hairs around the edge, or the black may be limited to a bar across the mesonotum, leaving the hind border as well as the scutellum yellow. The greatest variation, however, is seen in the pile of the abdomen. As one extreme, the pile of segments 2 and 4 is light yellow, with that of 3 black, or at most with a few reddish hairs intermixed, while at the other extreme, segments 2, 3 and 4 are covered with reddish pile, with no trace of black on 3. Practically all the intermediate stages are shown by my nine specimens. All agree in having long light yellow pile on the side of segment 2, in having some yellow on the posterior margin of 4, and in having 5 black, with at most a few reddish hairs. In most of my specimens a fringe of long yellow hairs projects, moustache-like, from the epistoma in front. It appears to be broken off in some specimens. The tibiae and tarsi vary in colour from brownish to yellowish. The last joint of the tarsus is always brown except the pulvilli, which may be yellow.

The female resembles the male closely. The face is only thinly pollinate with yellow. The eyes are separated by about the length of a millimeter. The front is coloured as in the male. The vertex is black.

68. *Criorhina tricolor*, Coquillett.—Vancouver, May 10, 1902; Mt. Cheam, Aug. 5-11, 1903; Grouse Mt., July 19, 1903. Nine specimens in all, both sexes, from R. V. Harvey. I have placed these specimens in this species provisionally, as I have not been able to make out any

structural differences to separate them from *tricolor*. They differ considerably from Coquillett's description in colour markings, and may be a distinct species, but, knowing the tendency of related species such as *C. Kincaidii* and *C. nigripes* to vary in this respect, I hesitate to separate them until further study. Coquillett's type is from Alaska.

69. *Criorhina nigripes* (Williston).—Vancouver, April 9 and 11, 1903, taken by R. V. Harvey. Two specimens, both females. One of these has a distinct margin of yellow hairs on the hinder border of abdominal segments 2 and 3. Otherwise they are identical with Williston's type from California in the Mus. Comp. Zool., at Cambridge, Mass.

70. *Criorhina scitula*, Williston.—Taken at Port Renfrew, Aug. 10, 1902, and by Harvey, at Vancouver, June 22, 1902, and at Mt. Cheam, Aug. 5-10, 1903.

71. *Crioprora alopes* (Osten Sacken).—A specimen was sent me by E. M. Anderson, taken at Victoria, April 16, 1897; and another was received from Harvey, taken at Vancouver, April 12, 1902, both females. I have seen no description of the female, but it is very much like the male in all respects except the following: Eyes widely separated; the yellow-red pile of the front continued back upon the occiput at the middle. Pile of the scutellum light yellowish; in one specimen a few black hairs on the margin; the other has the pile entirely without black.

72. *Crioprora femorata*, Williston.—A single specimen taken by Harvey, at Wellington, April 15, 1903.

73. *Pocota grandis* (Williston).—Harvey has taken this species at Vancouver, Oct. 3, 1902, and at Mt. Cheam, Aug. 7, 1903. Two females are in my possession. They are essentially like the male, differing only in the separation of the eyes. The rather broad front is brownish pruinose, with short dark yellow pile. On the under side the middle tarsi are beset with short sharp black spines, not present on the other tarsi.

74. *Brachypalpus pulcher*, Williston.—Port Renfrew, July 25, 1902, and by Harvey, at Goldstream, Aug. 10, 1902. A specimen is also in my collection marked "Br. Col., Sept. 5, 1897." Both sexes present. The species is described from Washington and Oregon.

75. *Xylota fraudulosa*, Loew.—A single male specimen taken at Port Renfrew, June 26, 1901, undoubtedly belongs here, though a trifle larger than my eastern specimens. It has been recorded in the west from Washington.

76. *Xylota barbata*, Loew.—Port Renfrew, July 25, 1902, and Glacier, Aug. 21, 1902, and by Harvey, at Vancouver, June 19, 1903. Taken also at Seattle, Wash.

77. *Syrirta pipiens* (Linné).—Abundant. Port Renfrew, Victoria, Vancouver, Agassiz and Glacier, at dates ranging from July 17 to Aug. 19. Harvey has taken it at Vancouver, June 19, 1903. Taken also at Laggan and Banff, Alberta.

78. *Sphecomyia Pattoni*, Williston.—A single male specimen taken at Glacier, Aug. 21, 1902, I place here with some doubt. In general appearance it is much like *Pattoni*, but it shows the following differences: The ground colour of the face seems to be entirely dull black under whitish pollen, and there is no shining facial stripe; the spots of the thorax white instead of yellow, and there is a fringe of yellow pile on the scutellum; the legs differ in the extent of yellow and black. It may be a distinct species. The type locality of *Pattoni* is Washington.

SOME NOTES ON APHIDIDÆ.

BY T. D. A. COCKERELL.

Macrosiphum ambrosiæ (Thomas).—*Siphonophora ambrosiæ*, Thomas, Bull. Ill. State Lab. Nat. Hist., 1878, p. 4.

Found at Pecos, New Mexico, on *Lactuca*. The following account is based on the Pecos specimens:

Very dark brown, very shiny; legs, antennæ and nectaries black, except that the basal part of legs, to near middle of femora, is brownish-white; stigma pale green; cauda of winged ♀ yellowish-white. Measurements of winged ♀ in μ : Marginal cell about 900, of which about 340 is substigmatal; cubital vein between branches 850 to 970; cauda 450; nectaries about 820, minutely imbricated; beak about 950, last joint about 160; antennal joints, (1) 130, (2) 80, (3) 900, (4) 750, (5) 725, (6) 200, (6a) 1,130; 3 has numerous sensoria on the under side, 4 has no sensoria; the hairs on 3 and basal half of 4 are knobbed, as also are practically all those on the anterior legs.

Young dull reddish, minutely tuberculate, not pruinose.

This Pecos form may be separable as a variety; in Schouteden's table of European species it runs to *M. cichorii* (Koch). It certainly is not *M. muralis* or *M. lactuce*.

Pemphigus lucifugus (Zehnt.).—*Tetraneura lucifuga*, Zehntner, De Pflanzenluizen Van het Suikerriet op Java, XV. (1901). Pl. 2, figs. 29-34.

By the venation of the hind wings this cannot be a *Tetraneura*.

Cladobius Beulahensis, n. sp.—Winged ♀: Rather large, robust; head and thorax black; abdomen grayish-brown, dorsum with a broad, dull black band on each segment, sides with large black spots; on the first four segments there is a considerable interval between the bands and the spots; ventral surface of abdomen immaculate, except that the last segment bears a large transverse black spot; insect thinly clothed with short hairs; legs very hairy, dark ferruginous; knees, end of tibiæ, and tarsi black; wings ample, hyaline, not darkened along the veins, stigma large, grayish-brown, fork ample, but shorter than its stem; antennæ reaching second abdominal segment, blackish, third segment ferruginous; cauda broad and rounded, hairy, not produced; nectaries short, distinctly swollen, ferruginous, black at apex, very much longer than broad; beak reaching posterior margin of middle coxæ, or at least their base. Length of insect, $3\frac{1}{3}$ – $3\frac{1}{2}$ mm. Measurements in μ : Antennal joints, (3) 500, (4) 260–290, (5) 250, (6) 170, (6b) 310. Nectaries about 250. The prothorax has a lateral tubercle.

Young dark gray, slightly purplish; femora dull whitish.

Beulah, New Mexico, prox. 8,000 ft., Aug. 4, on *Populus tremuloides*, in little colonies (winged and young) on the twigs. The leaves of the tree were much curled, I suppose by the aphides. Related to *C. bicolor*, but not identical; also clearly distinct from *C. salicti*. By the banded abdomen it resembles *C. pilosus* (*Pterocomma pilosa*, Buckton), but it is not the same. It is not *C. salicis*, and it is certainly not *C. populeus*, as that insect is figured by Buckton. There seems to be some confusion about *C. populeus* (sometimes called *populneus*); it has been recorded from Greenland (Rübsaamen) and Alaska (Pergande), and might be expected in the Rocky Mountains,* but so far as I can make out our insect is quite distinct from it.

Aphis medicaginis, Koch.—Abundant at Pecos, New Mexico, on *Glycyrrhiza lepidota*. Some were found on *Sphaeralcea Fendleri* growing near the *Glycyrrhiza*.

Lachnus viminalis (Fonsc.) = *dentatus*, Le Baron.—Pecos, New Mexico, 1903, on *Salix*. New to New Mexico.

Chaitophorus negundinis, Thos.—Pecos, N. M., 1903 (Dr. M. Grabham). *C. populicola*, Thos., was also found at Pecos.

Thirty-eight Aphididæ are known from New Mexico so far.

*The willow-coccid *Eriococcus borealis*, described from Dawson City, N.-W. T., has since been found by me at Beulah, New Mexico.

NEW SPECIES OF NORTH AMERICAN LEPIDOPTERA.

BY WILLIAM BARNES, S. B., M. D., DECATUR, ILL.

(Continued from page 244.)

Prothymia rosario, n. sp.—Expanse: 26 mm.

Fore wings chrome yellow, a pink patch at base of wing, about 3 mm. wide; this is most marked on costa and between median and submedian veins. A subterminal pinkish band, broad at base, where it is confluent with the pink fringe; at centre is narrow and furthest removed from margin, at inner angle it broadens out, becoming again confluent with fringe. Fringe pink, in one specimen slightly paler inwardly. Hind wings pale yellowish white, fringe concolorous.

Beneath, fore wings pale yellowish along costa, outer and inner margins, dusky centrally, with indications of discal dot, pinkish spot at apex. Hind wings as above. Thorax and abdomen yellowish, head darker yellowish, more or less pink intermixed. Palpi yellowish, pinkish at tip. Legs pink externally, pinkish internally.

Type: ♂ and ♀. Huachuca Mts., Arizona, July. One of the specimens from Mr. Poling.

Apatelodes uvada, n. sp.—The general type of maculation is similar to *A. lacetania*, Druce (Biol. Cent. Amer., Vol. II., 437, Pl. 87, fig. 12 and 13), and to *A. diffidens*, H. E. (Entom. Amer. III., 92; Biol. Cent. Amer. II., 438, Pl. 87, fig. 15), but in detail there is a marked difference from the figures as well as from the descriptions. Fore wings light gray, with pale brown shadings, the whole with a slight olivaceous tinge. As in *diffidens*, there is a straight brownish line from junction of basal and middle thirds of costa almost to inner angle. Below this line the wing is gray, above it more or less shaded with brown. On inner margin at inner third are two black spots, one on margin, the other above and extending a trifle farther outward, separated more or less distinctly from first. Beyond these, and only separated from them by a narrow space of ground colour, is a short black bar, which becomes lost before reaching oblique line. The course of the bar and spots is obliquely outward from inner margin, and they seem to be the remnants of a double transverse line, which if angled in the middle of the wing and then run inwardly would strike costa at beginning of oblique line. In one specimen a slight thickening of the oblique line on costa seems to represent a remnant of the transverse line. About 2 mm. further outward a second transverse brown line can be made out; in one specimen this is evidently double on

inner margin. It passes from costa outwardly oblique, along inner side of discal spot to oblique line, whence making somewhat of an angle it runs obliquely inward to inner margin; it is rather faint, but can be followed in both specimens its whole length. A third more distinct brown transverse line leaves costa at outer third, curving outwardly around cell; it then makes a broad inward curve to inner margin at about its outer fourth. Another transverse line runs parallel to third and about 2 mm. from it; it is pale whitish, but in one specimen there is a quite well marked brown inner edging to this, especially at costa and inner margin. In the other specimen this it not so evident. There are two superimposed subapical black wedges, base outwardly, resting on a short pale bar, which terminates below in a small round pellucid dot, which has a minute black dot to its outer side. On holding the wing against the light the pellucid dot is very striking, and there can be seen a second very minute one just above it. Beyond cell the marginal area it clear brownish, but at apex it is mostly gray, and below centre of wings the pale shading on veins, and a broad, rather diffuse included gray shade, cover fully half the space. Fringe brown. Discal spot small, pale, upright. Secondaries reddish brown, with distinct pale mesial band; within this is a narrow dark band, distinct in one specimen, fainter in the other. This terminates in the upper of two brownish black spots on inner margin, well above inner angle. The second lies on upper side of termination of mesial band; in one specimen the spots are somewhat run together. Fringe concolorous or a shade paler.

Under side of primaries reddish, washed with gray along costa, darker reddish brown at apex beyond the distinct pale bar which corresponds to the one on upper surface. A dark reddish extra mesial band and a pale subterminal one. Secondaries: upper two-thirds reddish, lower third pale, the line between the shades being quite sharply defined, very distinct dark reddish brown mesial and pale extra-mesial bands, the latter especially towards inner margin slightly edged on inner side with brown. Very faint, scarcely discernible traces of discal spots on both wings. Head and thorax concolorous with base of primaries, abdomen with secondaries. Patagia gray, with brown transverse band, near but not quite at tip. Palpi, coxæ and inner side of fore tibiæ brownish, rest of legs gray, abdomen beneath fuscous, laterally with small blackish tufts.

Types: 2 ♂'s. Pima Co., Arizona, July. Mr. Poling. It is possible this may be the same as Dr. Dyar's *pudefacta*, the description of which has just reached me.

Hemiceras pilacho, n. sp.—Expanse : 28 mm.

Ground colour pale yellow, rather thinly dusted over with golden yellow scales. Body parts with more of a brownish tint. Front of head with round turreted projection, yellowish brown, with black centre and black ring. Thorax, largely denuded in the specimen before me, is somewhat darker than abdomen. T. a. line somewhat outwardly oblique, formed of three large teeth, one from costa to median vein, one between median and submedian veins, third between latter and inner margin, dark golden yellow. T. p. line runs from junction of outer and middle thirds of inner margin obliquely outwards almost to apex, where it curves inward slightly before reaching costa, the same colour as t. a. line. A very faint trace of s. t. line, scarcely to be noticed. Ordinary spots concolorous, outlined with golden yellow scales. Orbicular large, round. Reniform large, oval, slightly inwardly oblique, joined to orbicular by a slightly thicker accumulation of the dark yellowish scales than elsewhere. Veins of wings slightly darker. Fringe fuscous, with an even dark golden yellow basal line. Hind wings white, with a faint yellowish tinge, very slightly dusky at extreme edge. Fringe concolorous, faint, slightly darker, basal line.

Beneath very pale yellowish colour. Orbicular and reniform showing as obscure paler spots in cell. T. p. line showing faintly through wing. Wing very slightly darkened through cell and along veins beyond it. Hind wings pale yellowish white, slightly darker along costa.

Type : 1 ♂, So. Arizona. Mr. Poling.

Eunotela moqui, n. sp.—Expanse : 33 mm.

Fore wings light gray, with a slight reddish flush. Basal line double, slightly angled on median vein, inner portion black, outer brownish. Beyond this a diffuse black shade across wing, outwardly curved to median vein, then inwardly curved to inner margin. T. a. double, black, distinct, slightly outcurved. A small diffuse black spot on costa beyond t. a. line. T. p. line double, inner portion black, outer brown, distinct and scalloped between veins below cell, both lines brown opposite cell, lunular and preceded by a distinct black lunular bar in cell, which is continued to costa, after making a slight angle on subcostal vein. S. t. line irregular, broken, somewhat diffuse, not sharply defined, more pronounced in upper two-thirds of wing, at costal end a small black dash running almost but not quite to apex. Distinct black terminal line, quite even in upper, somewhat irregular in lower half. Veins more or less darkened. Fringe

concolorous, with pale points at end of veins. Hind wings white above and below. Fore wings smoky beneath, with about four pale points on costa, towards apex. Antennæ shaft yellow, pectinations brown. Head and thorax dark gray. Abdomen ochraceous above, dirty white below.

♀, fore wings a trifle darker, with markings somewhat heavier, especially the terminal line, while the subterminal line is equally heavy to inner margin. Secondaries broadly fuscous outwardly, with faint mesial band.

Type: 1 ♂, So. Arizona, July; 1 ♀, Santa Catalina Mts., Pinal Co., Ariz. Mr. Poling.

Hapygia estrella, n. sp.—Closely allied to *H. xolotl*, Schaus (Proc. Zool. Soc., London, 1892, p. 339; Biol. Cent. Amer. II., 464, Pl. 91, fig. 19), but differs from figure and description, and Mr. Schaus, who on a recent visit kindly examined most of the species described in the present paper, thinks it distinct from his species.

♂ expanse: 50 mm.; ♀, 57 mm.

Colour of male chestnut, of female darker, almost walnut-brown. Basal line faint but traceable, pale, with dark brown border. T. a. faint, outwardly oblique, somewhat wavy, pale, with slightly darkened border. In female there is a dark shade between t. a. and basal line on lower half of wing. T. p. line pale, with slightly darker outer border, distinct but not prominent, inwardly oblique from costa, slightly outcurved over cell, then with a slight inward curve to inner margin. A faint black, broken subterminal line, emphasized at apex so as to form a short oblique apical dash, within which is a metallic silver mark. In cell is a slightly outwardly oblique oblong silver ring, constricted in middle, with small dot of silver joined to its upper inner side. The centre of ring is silver filled, leaving a narrow border of ground colour. There is a second small round silver spot in cell to inside of upper end of first; in the female this has a fine central dot of ground colour, in the male it is solid. Fringe concolorous outwardly, paler within. Inner margin incised and toothed, more marked in female. Hind wings paler than fore, pale reddish fuscous in male, blackish fuscous in female.

Beneath fore wings much paler than above, even light reddish brown, somewhat darker in centre and along costa. Two pale spots in cell

corresponding to silver spots above. Hind wings still paler, with faint traces of mesial band in female. Head, collar, patagia and thorax concolorous with fore wings. Abdomen with more of a yellowish tinge above, beneath paler.

Types: 1 ♂, 1 ♀, Pima Co., Arizona, July. Mr. Poling.

Gloveria coronada, n. sp.—Expanse: ♂, 70 to 85 mm.

Chocolate brown, one specimen slightly grizzled with gray. Hind wings a shade lighter than fore. Fore wings with two pale whitish transverse lines, one at inner fourth, moderately outcurved, even, distinct, about $\frac{1}{2}$ mm. in width. Outer line at about outer third broadly outcurved around cell, then with slight inward curve to inner margin, at a point somewhat beyond middle. The two lines are thus about twice as widely separated on costa as on inner margin. The subterminal space is somewhat paler than the concolorous terminal, in one specimen markedly so. The subterminal line is only indicated by the contrast between the two; it is irregularly dentate, the pale extending outward along the veins, almost to margin in places. A minute pale discal dot. Hind wing with faint trace of pale mesial band. Fringes concolorous, extreme edge whitish. Head and thorax concolorous, abdomen paler. Beneath fore wings much paler than above, hind wings grayish at base, gradually darkening to outer margin, where it is same shade as fore wings. Distinct pale mesial band on both wings, fading out on hind wings before reaching inner margin. There is a brown inner accompanying shade line, more or less evident, especially on hind wing. Thorax and legs concolorous with fore and abdomen with hind wings. Antennæ brown.

Types: 4 ♂'s, Huachuca Mts., Arizona; 1 ♂, Chiricahua Mts., Ariz. Mr. Poling.

The colour and maculation remind one very strongly of *psidii*, but the shape of the wings is altogether different, being much broader, more like *Io*, or judging from the description, like *quadrina*.

The above description applies to four of our specimens, a fifth, however, more recently received from the Chiricahua Mts., has the ground colour of the fore wings replaced by gray to a much greater degree, the transverse lines appearing brown, with faint pale accompanying shades, and the subterminal line as an irregular row of brown spots. The variation being the same so commonly seen in *Malacosoma (Clisiocampa)*.

LIST OF ADDITIONAL MANITOBA LEPIDOPTERA.

BY E. FIRMSTONE HEATH, CARTWRIGHT, MAN.

Since Mr. A. W. Hanham published his lists of Manitoba Lepidoptera in the CANADIAN ENTOMOLOGIST (1897-1901), many additional species have been taken in the Province by myself and others. Where no special locality is given in the following list, the capture was made by me on my farm on the Long River, and in almost every instance the identification has been made by Dr. John B. Smith, to whom my warmest thanks are due for the kindly trouble that he has taken with my material.

Sphinx Vancouverensis, Hy. Edw.—At light during June and July in about equal numbers with the form *albescens*, Tepper.

Hyphantria textor, Harris.—Only one at light in July.

Apantesis determinata, Neum.—A form of *Williamsii*, Dodge, in the previous list.

Apantesis michabo, Grote.—Rounthwaite, May 20 (Marmont).

Apantesis oithona, Strecker, *a. rectilinea*, French.—At light at Rounthwaite, Aug. 5 (Marmont). Bred from larvæ on *Castilleja sessiliflora* at Aweme (Criddle and Fletcher).

Thyris lugubris, Boisd.—Rounthwaite (Marmont). Sandhills near Aweme, flying in bright sunshine, July 20 (Criddle and Fletcher).

Alypia octomaculata, Fabr.—Several taken flying in the sunshine about wild raspberry bushes when in flower, together with *Langtonii*, Couper.

Acronycta hastulifera, Sm. and Abb.—July; taken at sugar occasionally.

Acronycta leporina, Linn.—Several taken at sugar, June and July, 1899.

Acronycta superans, Guén.

Acronycta albarufa, Grote.—July; at sugar occasionally.

Acronycta inclarata, Smith (hamamelis, Guén).

Acronycta illita, Smith.—June; at sugar. This is one of the earliest to appear.

Acronycta modica, Walk.—One taken at sugar in July.

Moma geminata, Smith.—Previously recorded as *fallax*, H.-S.

Platysenta videns, Guén.—July; several at sugar and light.

Hadena vultuosa, Grote.—June 25, etc.; sometimes plentiful at sugar.

- Hadena cogitata*, Smith.—June ; a few at sugar most years.
- Hadena lona*, Strecker (*runata*, Smith).—July ; a few at sugar. Winnipeg at end of June ; a few at light (Hanham).
- Hadena ferens*, Smith.—August ; at sugar, one only taken in 1903.
- Hadena adnixa*, Grote.—August ; at sugar, one only taken in 1903.
- Hadena claudens*, Walk.—August ; a few at sugar.
- Hadena allecto*, Smith.—Kinosota (Hutchinson) ; also taken in British Columbia and Dakota.
- Adita chionanthi*, Sm. and Abb.—Several at sugar ; August, 1900 and 1901.
- Rhynchagrotis gilvipennis*, Grote. This was previously reported under the name *chardinyi*, Boisd.
- Euretagrotis sigmoides*, Guén.—Not infrequently at sugar in July.
- Euretagrotis attentata*, Grote.—With the preceding species.
- Noctua rosaria*, Grote.—Previously recorded as *rubifera*, Grote. It is generally abundant both at light and sugar during June and July, whereas *rubifera* is scarce here, one only having been identified in my collection by Dr. Smith.
- Noctua inopinatus*, Smith.—One only recognized so far.
- Chorizagrotis soror*, Smith.—One taken at sugar or "honey-dew" on black cherry with others of the genus ; in June.
- Chorizagrotis auxiliaris*, Grote.—Several at sugar and honey-dew in June.
- Chorizagrotis agrestis*.—With the preceding species.
- Chorizagrotis balanitis*, Grote.—One taken at sugar, July 8, 1903.
- Euxoa maimes*, Smith.—Two taken at light with *divergens* in May ; the two species have previously been confused. Brandon (Hanham).
- Euxoa citricolor*, Grote.—One at sugar, Sept. 29, 1903.
- Euxoa acornis*, Smith.—Occasionally at sugar in July.
- Euxoa fuscigera*, Grote.—Several at sugar, July and August, 1903.
- Euxoa intrita*, Morr.—Found among some duplicates, date wanting.
- Euxoa titubatis*, Smith.—A few at sugar in July.
- Euxoa verticalis*, Grote.—A few at sugar in July.
- Euxoa albipennis*, Grote.—A few at sugar in July.
- Euxoa furtivus*, Smith.—A few at sugar, July and August.
- Euxoa perexcellens*, Grote.—Occasionally at sugar with *insulsa*.
- Euxoa abar*, Strecker.—One at sugar, Sept., 1903.
- Euxoa nordica*, Smith.—Occasionally at sugar, June and July.

- Prodenia ornithogalli*, Guén.—Winnipeg, at sugar, Oct. 19, and later, 1900 (Hanham).
- Psaphidia Grotei*, Morr.—Winnipeg and Brandon, rare (Hanham).
- Ufeus satyricus*, Grote.—At sugar, others in the house in October.
- Mamestra imbrifera*, Guén.—A few at sugar in June.
- Mamestra Oregonica*, Grote.—At sugar with *trifolii*.
- Mamestra Goodellii*, Grote.
- Mamestra lucina*, Smith.—At sugar. Previously recorded as *olivacea*, Morr.
- Mamestra circumvadis*, Smith.—Aweme (Criddle).
- Nephelodes tertialis*, Smith.—Winnipeg, August 16-24 (Hanham).
- Rancora albicinerea*, Smith.—Rounthwaite, April 24 (Marmont).
- Bellura gortynoides*, Walk.—A few taken at light, decidedly rare June 18-30.
- Morrisonia sectilis*, Guén.—A few at sugar, August 12, 1903.
- Leucania minorata*, Smith.—Previously listed as *fallens*, Linn.
- Leucania obscurior*, Smith.—Previously listed as *albilinea*, Hubn.
- Leucania megadia*, Smith.—At light in July. At first confused with *insueta*, Guén.
- Himella contrahens*, Walk.—Listed as *thecata*, Morr.
- Tæniocampa peredia*, Grote. Two or three at sugar, July, 1900. Not seen since.
- Xylina hemina*, Grote.—Several at sugar, during October, 1903.
- Xylina amanda*, Smith.—Previously listed as *contenta*, Grote, which does not seem to occur here.
- Xylina holocinerea*, Smith.—Several at sugar, during September and October, 1903.
- Xylina Oregonensis*, Harvey.—One only at sugar, in October.
- Xylina unimodia*, Lint.—Several at sugar, in September and October.
- Xylina Grotei*, Riley.—Several at sugar, in September and October.
- Xylina antennata*, Walk.—Several at sugar, in September and October.
- Xylina tepida*, Grote.—Several at sugar, in September and October.
- Xylina*, n. sp., in Dr. Smith's hands for description.
- Cucullia postera*, Guén.—Taken but once, some years ago.
- Nonagria subflava*, Grote. Taken occasionally at light in the middle of August, both here and at Winnipeg.
- Papaipema rigida*, Grote.—Listed before as *cerina*, Grote.

- Papaipema nebris*, Guén.—One taken at light in August.
- Papaipema circumlucens*, Smith.—A few at light in August.
- Pyrrhia umbra*, Huful.—One at currant bloom, in May, and a few at sugar, in August and September.
- Orthosia decipiens*, Grote.—Winnipeg.
- Orthosia inops*, Grote.—A few at sugar.
- Cosmia punctirena*, Smith.—A few at sugar, in August, 1900.
- Epiglaea decliva*, Grote.—Several at sugar, September and October, 1903.
- Copablepharon grandis*, Streck.—One only, at light, August 1, 1899.
- Heliothis armiger*, Hubn.—One at light, Winnipeg (Hanham).
- Xanthoptera semiflava*, Guén.—A few taken nearly every year on the prairie in the day time, by beating clumps of *Eleagnus argentea*, in July.
- Melicleptria villosa*, Grote.—At St. James, Winnipeg, taken in 1900, July 29 (seven), Aug. 4 (seven), Aug. 5 (five). A white daisy-like flower, *Erigeron glabellus* (determined by Dr. Fletcher), occurred in scattered patches in a meadow, and these pretty little moths were all found resting on the centre of the flowers. They were hard to see, and more often than not would fall to the ground and lie close to escape capture (Hanham).
- Syneda Athabasca*, Neum.—Beulah.
- Syneda Alleni*, Grote.—Aweme.
- Catocala abbreviatella*, Grote.—One or two at sugar, late in July.
- Homoptera unilineata*, Grote.—A few at sugar, May 13; also flying about cherry and plum bloom.
- Erebus odora*, Linn.—Winnipeg, August 14, 1900. A male with wings rather frayed alighted on a tree when I was renewing the sugar on it at dusk (Hanham). Beulah (Dennis).
- Epizeuxis rotundalis*, Walk.—A few at sugar, in July.
- Zanclognatha protumnusalis*, Walk.—A few flying in July.
- Ianassa Coloradensis*, Hy. Edw.—One only; July 10, 1903.
- Schizura concinna*, Sm. and Abb.—Reared from larvæ some years ago; they were quite numerous on *Populus aspen*; larvæ not seen since. One moth taken at light.
- Drepana arcuata*, Walk. One taken on the wing in June.

SYNOPSIS OF PROSOPIS AND COLLETES, WITH SUPPLEMENTARY NOTES AND DESCRIPTIONS.

BY CHARLES ROBERTSON, CARLINVILLE, ILLINOIS.

This paper belongs with the series on local species—Andreninae, Megachilidæ and Bombinae, Tr. Am. Ent. Soc., 28: 187; 29: 163; Spheco-dinae, Ent. News, 14: 103; Balictinae, Nomadinae, Epeolinae, Anthophila, CAN. ENT., 34: 245; 35: 172, 284; 36: 37.

For the length of the malar space is taken the shortest distance between the eye and the mandible; the breadth is that of the mandible at base; joint refers to antenna, segment to abdomen; cells III₅ and III₁ are the second and third submarginal cells.

Of 81 specimens formerly referred to *P. modesta*, Say, 45 are referred to *P. Illinoensis*, and 36 to *P. Sayi*, sp. nov. I have given up the attempt to identify *P. modesta*, Say. The type of *P. Sayi* is a pair taken in copula on flowers of *Heracleum lanatum*, June 4, 1888. Both have a dot on tegula.

According to my separation of them, *P. Illinoensis* sometimes has a dot on tegula, and *P. Sayi* often has. The determination of *P. affinis* thus becomes more doubtful than ever. I use the name *P. zizie* for the insect I have always called *P. affinis*, Sm.

PROSOPIS, Fabricius.

Females

- Front coxa with a lateral tooth: eyes short; cheeks broad; face marks, tubercles, sometimes two lines on collar, front and middle knees, and base of hind tibiæ, yellow; enclosure of metathorax rugose on basal middle; 6 mm *thaspii*.
- Front coxa simple; eyes long; cheeks narrow; at least bases of tibiæ yellowish; metathorax usually more rugose 1.
1. Segment 1 and base of 2 red; face marks, tubercles, and dot on tegulae, yellow; wings beyond middle clouded; 6-7 mm *nelumbonis*.
- Segments 1-6 black 2.
2. Collar with yellow marks; tubercles and face marks yellow; 5-6 mm 3.
- Collar black; 4-5 mm 3.
3. Entirely black, except bases of tibiæ and sometimes narrow lines on face; slender *saniculæ*.
- Clavate face marks present; usually a spot on clypeus, tubercles and tegulae; a little more robust *pygmæa*.

4. Edge of wing base and spot on tegulæ yellow.....ziziae.
 Edge of wing base black; tegulæ black; sometimes with a yellow
 dot 5.
5. Metathorax more rugose, more pubescent; enclosure less distinct,
 bordered by an impressed line, often obscured by the reticulations;
 face marks more yellow, less produced, more rounded on eye
 margin; wings more fuscous: flagellum darker; rarely a dot on
 tegulaIllinoensis.
 Metathorax less rugose, less pubescent; enclosure more distinct,
 bordered by a raised line; face marks paler yellow, more produced
 and pointed on eye margin; wings more hyaline; flagellum paler
 beneath; tegula often with a yellow dot; *sp. nov.*: 36
 specimensSayi.

Males.

- Front coxæ with a lateral tooth; metathorax moderately rugose; spot on
 labrum, scape exteriorly, two lines on coliar, and tubercles, yellow; face
 marks somewhat club-shaped on the sides; 5 mm.....thaspii.
- Front coxa simple; metathorax more rugose; at least the face, tarsi,
 anterior tibiæ in front, and middle and hind tibiæ at base,
 yellowish..... 1.
1. Base of abdomen red; 6 mmnelumbonis.
 Base of abdomen black..... 2.
2. Face mark broken into four parts by the irregular encroachment of
 black in the sutures; elsewhere black, except on the legs; scape
 broad, clavate; 4-5 mm.....saniculæ.
 Face mark entire; tubercles coloured..... 3.
3. Lateral extension of face mark usually club-shaped, always diverging
 from eye; scape exteriorly and sometimes dot on tegulæ pale
 yellowish; 4 mm.....pygmæa.
 Lateral extension of face mark ending near eye; usually two lines on
 collar; 5-6 mm..... 4.
4. Scape concave exteriorly; spot on tegulæ, edge of wing base, labrum,
 mandibles more or less, often the scape exteriorly, yellow; face
 mark club-shaped laterally; yellow at base and apex of middle tibiæ
 connected..... ziziae.
- Scape ordinary; tegulæ, labrum and mandibles rarely with yellow... 5.

5. Middle and hind tibiæ with a blackish spot behind, hind ones often entirely yellow; segment 1 impunctate; face mark sometimes club-shaped laterally; flagellum darker; tegulae unspotted; wings more fuscous.....*Illinoiensis*.

Middle and hind tibiæ yellow at base; segment 1 punctate; face mark pointed on eye margin; flagellum paler beneath; tegulae sometimes spotted; wings hyaline.....*Sayi*.

COLLETES, Latreille.

Females.

- Front coxæ with distinct hairy spines; malar space one-fifth to one-fourth as long as wide; 9-11 mm.....8.
- Front coxæ without distinct hairy spines.....1.
1. Thorax above with pubescence ochraceous, not mixed with black; 10-11 mm.....7.
- Thorax above with pubescence griseous, mixed with black.....2.
2. Ventral segment 6 bicarinate; metathorax rounded, with triangular, rugose reticulated enclosure; joint 3 longer than 4 or 5; malar space one-third as long as wide; 9-11 mm.....*compactus*.
- Ventral segment 6 simple; metathorax truncate, with transverse series of subquadrate pits.....3.
3. Hind metatarsus about twice as long as broad; clypeus broadly sulcate; labrum concave, striate; joint 3 nearly = 4-5; spurs dark; malar space one-fourth as long as wide; 9-11 mm...*latitarsis*.
- Hind metatarsus three or four times as long as broad.....4.
4. Postscutal anteriorly with transverse series of subquadrate pits; rather bare; coarsely punctured; malar space linear; 10-12 mm...*nudus*.
- Postscutal anteriorly without transverse series of subquadrate pits...5.
5. Clypeus in profile strongly convex, closely and evenly punctured; joint 3 nearly = 4-5; malar space linear; 9-10 mm...*brevicornis*.
- Clypeus in profile slightly convex, somewhat sulcate, puncto-striate. 6.
6. Malar space more than one-third as long as wide; clypeus shining, coarsely puncto-striate; front coxæ simple; 12-13 mm...*inæqualis*.
- Malar space hardly one-third as long as wide; clypeus opaque, finely puncto-striate; front coxæ with blunt spines; 9-11 mm...*Willistonii*.
7. Clypeus opaque, finely punctured, not sulcate; pubescence of mesonotum very fine and dense; abdomen opaque, finely punctured, fasciæ very even; nervures pale; malar space about one-fifth as long as wide.....*speciosus*.

- Clypeus shining, coarsely puncto-striate, sulcate; abdomen shining, rather coarsely punctured, fasciæ often obscured by moisture; nervures dark; malar space about one-third as long as wide eulophi.
8. Prothorax with strong lateral spines; pubescence above mixed with black; segment 1 distinctly punctured, extreme sides fasciate, 2 fasciate at base and apex; scutel puncto-striate; malar space short armatus.
- Prothorax without strong lateral spines; pubescence of thorax above not mixed with black 9.
9. Segment 2 rather coarsely punctured; fasciæ narrow; cell III₅ narrowed about one-half above; claws cleft, the divisions nearly equal æstivalis.
- Segment 2 minutely punctured, or impunctate; fasciæ broad; cell III₅ not so strongly narrowed above 10.
10. Wings whitish; pubescence white; inner claw tooth subapical albescens.
- Wings yellowish; inner claw tooth median; hind spur more distinctly pectinate 11.
11. Pubescence ochraceous; cell III₅ little longer than III₄. Americanus.
- Pubescence whitish; cell III₅ longer than III₄; sp. nov similis.
- Males.
- Antennæ long, joints much longer than wide 4.
- Antennæ short, joints shorter, or hardly longer, than wide 1.
1. Joint 3 longer than 5; labrum bituberculate; clypeus convex; pubescence pale; malar space linear; 8 mm brevicornis.
- Joint 3 not longer than 5 2.
2. Posterior face of metathorax coarsely, closely, distinctly punctured; abdomen coarsely punctured; labrum with median fovea; joints of antennæ a little longer than wide; flagellum beneath, tarsi, tibiæ more or less and their spurs, testaceous; malar space linear; 11 mm Robertsonii.
- Posterior face of metathorax shining, reticulated, impunctate; abdomen rather finely punctured; malar space more than one-third as long as wide 3.

3. Hind metatarsus about twice as long as broad, with a posterior lobe ; clypeus broadly sulcate ; labrum striate ; front femur with long white hair ; thorax above mixed with black ; 9-10 mm. *latitarsis*.
Hind metatarsus about three times as long as broad ;
8-9 mm. *Willistonii*.
4. Joint 4 shorter than 2-3, not much longer than 3 ; labrum plane, or with a faint fovea ; ventral segments 2-5 strongly bearded laterally ; malar space short ; thorax above ochraceous ; cell III₅ short, strongly narrowed above. *aestivalis*.
Joint 4 about as long as 2-3. 5.
5. Malar space at least about one-half as long as wide. 8.
Malar space not more than one-third as long as wide. 6.
6. Postscutel with transverse series of subquadrate pits ; 9 mm. *nudus*.
Postscutel densely punctured and pubescent. 7.
7. Mesonotum rather evenly punctured ; prothoracic spines indistinct ; pubescence ochraceous ; 8 mm. *Americanus*.
Mesonotum with two densely punctured submedian streaks ; prothoracic spines distinct ; pubescence griseous or whitish, usually mixed with black on vertex and thorax above ; 8-9 mm. *armatus*.
8. Metathorax with triangular rugose enclosure ; malar space as long as wide ; pubescence mixed with black above ; 9-10 mm. *compactus*.
Metathorax truncate ; with transverse series of subquadrate pits. 9.
9. Pubescence of scutel mixed with black ; malar space shorter than wide ; 10-12 mm. *inaequalis*.
Pubescence of scutel not mixed with black ; 7-8 mm. 10.
10. Punctures of mesonotum and scutel about equal in size ; malar space shorter than wide ; pubescence rather dense, ochraceous. *eulophi*.
Punctures of mesonotum rather fine and sparse, of scutel very coarse ; malar space nearly as long as wide ; pubescence thin, griseous. *productus*.
- Megachile strophostylis*, sp. nov., ♀.—Black ; closely punctured and hardly shining ; pubescence rather long and pale ; short, thin and black on vertex, mesonotum, scutel, discs of segments 2-5, and base of 6 ; lateral ocelli about equally distant from vertex and nearest eye ; mandibles

with four broad teeth; clypeus short, sparsely punctured, except at base, margin dentate; mesonotum anteriorly with two oblique lines of whitish pubescence; segment 1 short, with a broad concavity, 2-5 with unusually broad fasciæ of pale pubescence; segment 6 very short and broad, a little convex in profile, clothed with long, appressed, glittering, yellowish or whitish pubescence, sometimes blackish at tip; scopa white, a little fuscous on segment 6; hind tibiæ broader than metatarsi; 12-14 mm.; 5 specimens.

In the paper on Sphecodinæ, Ent. News, 14: 103, Stelidium is a slip of the pen for Sphecodium.

Audrena polemonii belongs to Ptilandrena.

BOOK NOTICE.

INSTINCT AND INTELLIGENCE IN THE ANIMAL KINGDOM.—A Critical Contribution to Modern Animal Psychology, by Eric Wasmann, S. J. (Authorized Translation of the Second and Enlarged Edition).—B. Herder, St. Louis, Mo.

This is a book which ought to be read by every scientist for the clear insight which it gives into the dangers of drawing rash conclusions. Wasmann excels in clearness of thought, but most of all for his insistence upon accuracy in using terms. He gives the clearest definition of "instinct" we have ever met with. It is short, but full: "Instinct is a sensitive impulse to actions that are unconsciously adaptive"; or, more fully, "A sensitive impulse which induces a being to perform certain actions, the suitability of which is beyond the perception of the agent that performs them," while "intelligence" is the "power of formal conclusion." Again, he says, "there is a power of sensitive cognition which guides instinctive actions belonging to the exterior senses, and there is also an interior sense which perceives the interior state of the agent and feels the pleasant or disagreeable impression which the object of the exterior sense-perception makes upon it; hence we must add the power of sensitive imagination, and a sensile memory which reproduces exterior sense-perceptions and interior sensile feelings, and combine them, one with another, and with new sense-perceptions according to the nature

and laws of sensitive imaginations." Hence, instinctive actions arise when these faculties act to represent as pleasant to an agent what is objectively useful for its preservation, and that of its kind. But "intelligence" combines, with all this, deliberative thought, which takes in every aspect of the case, and draws conclusions of various kinds, both for the present and for the future. Hence, as the result of the study of the actual life and conduct of the creatures other than man, our author contends, and, we think, succeeds in maintaining his contention, that, in the correct sense of the term, those creatures cannot be proved to have "intelligence." He refuses agreement with the modern school of animal psychology on the ground that that school is lax in its use of the term intelligence. Their reasoning is, he thinks, founded on what is termed in logic, "ambiguous middle"; they really use "intelligence" in a double sense. In fact, all attempts to get even the most domesticated animals to "think" have proved abortive. Even Sir John Lubbock's poodle "Van" was a failure. Sir John tried to get his poodle to "read" by having two cards, one inscribed "food," and the other "out," and trained Van to bring the card "food" when hungry, and the other "out" when he wanted a walk. But Van often blundered. Lady Lubbock's lap-dog "Patience," though she had abundant opportunities of seeing the lessons, failed to take them in, nor did Van ever make the least attempt to teach her. There is no proof from even the case of ants that there is more in their actions than can be accounted for by our author's theory when these cases of ant "intelligence" are investigated by really scientific methods and human imagination is not called in to assist deductions.

The attempt, therefore, to prove, as modern animal psychologists try to do, that the intelligence of man differs only in degree, not in kind, from that of the lower creatures cannot be said to be at all established. Man is a thinking creature; he has a spiritual nature, not shared in by creatures lower than himself.

Then as regards "speech"—language—reasoning speech, so to call it, no animals but man have it, nor, in all these years of their existence, have they ever appeared even to seek to acquire it. Speech is the result of human and superior intelligence, and is the vehicle of reasoning thought properly so called.

There is a magnificent chapter on the "different forms of acquiring knowledge," which is, to our mind, one of the best portions of the book.

Another good chapter is that on a "Uniform Standard for Comparative Animal Psychology."

We would earnestly commend to all scientists a careful study of Chap. VII., Bk. V., in Mills' Logic, "on Fallacies of Confusion," as most useful to them in building up their theories. It has always appeared to us that modern animal psychologists are faithless to their theory of evolution. Evolution teaches us that there is an ever upward step in the succession of being; hence we should expect that this would take place in the case of man, the present culmination of all previous evolutions of being. This, Revelation makes known. Creatures below man have had evolved for them, in rising degrees, a sensitive soul, that can direct them to act suitably to their needs for obtaining good and avoiding harm. The next step would be the "evolution," so to call it, of a creature that would add intelligent reasoning, and a deeper insight into the true nature and reason of things; a being that would more nearly, in this and other ways, e. g., the moral sense of right and wrong, approach the character of the Great Author and Ruler of all. Man is clearly seen to surpass other creatures, especially in this last respect. Man has a conscience as regards, if we call it so, the abstract nature of good and evil as principles of conduct, not merely of expediency. The best of men in all ages have felt that they were not mere clods of the valley, but had a future. Revelation explains this by letting us know that that which differentiates man is his threefold nature; his highest constituent being his spirit, in which reside and act his intellectual and reasoning powers properly so called. Science, if it does not attempt to go beyond its province by calling in imagination to its aid, will find itself stopped at a certain point. If it assures us that acts and thoughts are the results of motion, or change, in the brain cells, it cannot tell us what that mysterious thing is that connects will, or thought, with that motion or change. Why not, then, accept the explanation afforded by Revelation? It is answered: Revelation does not clear up the mystery. No more it does; but it gives us the information that man has a nature not wholly common to other creatures, but is possessed of a constituent that enables him to see, more and more, into deep things and thoughts, and the next step higher will be when the new man "Shall know even as he is known."

W. E. COOPER.