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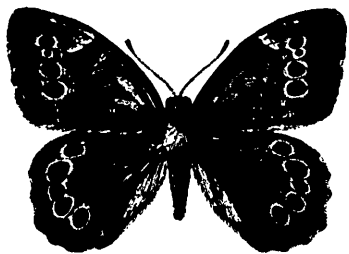
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The  
Canadian Entomologist

VOLUME XXXI.



DEIUS PORTLANDA.

EDITED BY

Rev. C. J. S. Bethune, M.A., D.C.L., F.R.S.C.,

LONDON, ONTARIO.

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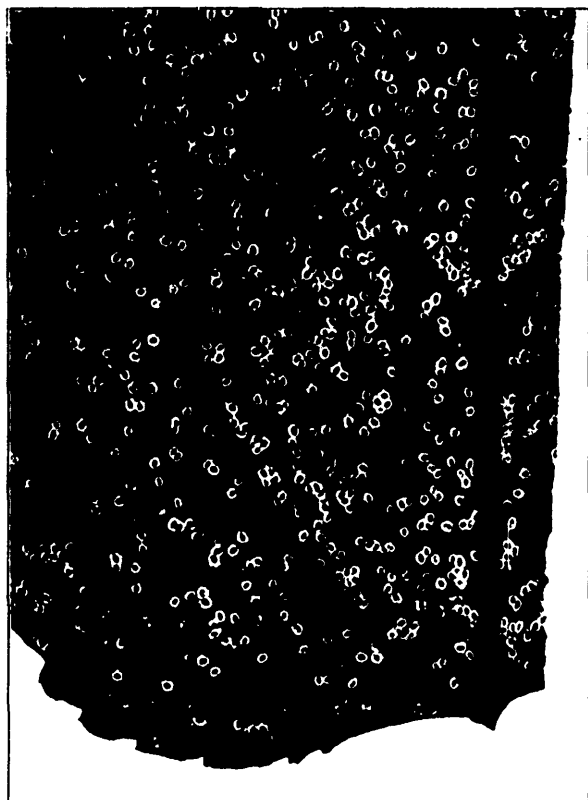
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PHOTOGRAPH OF ALFURODES MORI ON UNDER SIDE OF MULBERRY LEAF.  
ENLARGED ABOUT TWO-THIRDS DIAMETER.

# The Canadian Entomologist.

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No. 1.

## NEW, OR LITTLE KNOWN, ALEURODIDÆ.—I.

BY A. L. QUAINANCE, ENTOMOLOGIST, ILLA. EXP. STATION.

*Aleurodes mori*, n. sp.

*Egg*.—Length, .16 mm ; width, .08 mm ; elliptical, curved, light brownish in colour, marked with minute polygonal areas ; pedicel short, about one-tenth length of egg.

*Larva*.—Length, .43 mm.; width, .3 mm., varying somewhat ; shape, elliptical ; colour, whitish or yellowish white. Margin all around dentate, due to the usually short but acute incisions between the closely-set wax tubes. A very fragmentary marginal fringe frequently present ; no sub-marginal rim as in pupa-case. Wax tubes plainly extending mesad four to five times their breadth, then gradually disappearing. Abdominal segments moderately distinct. Eye spots small, reddish. Dorsal tubercles and setæ usually present as on pupa-case, but those of thorax sometimes wanting. Vasiform orifice, operculum and lingula essentially as in pupa-case. Exuvie from preceding moults frequently remain attached to larva.

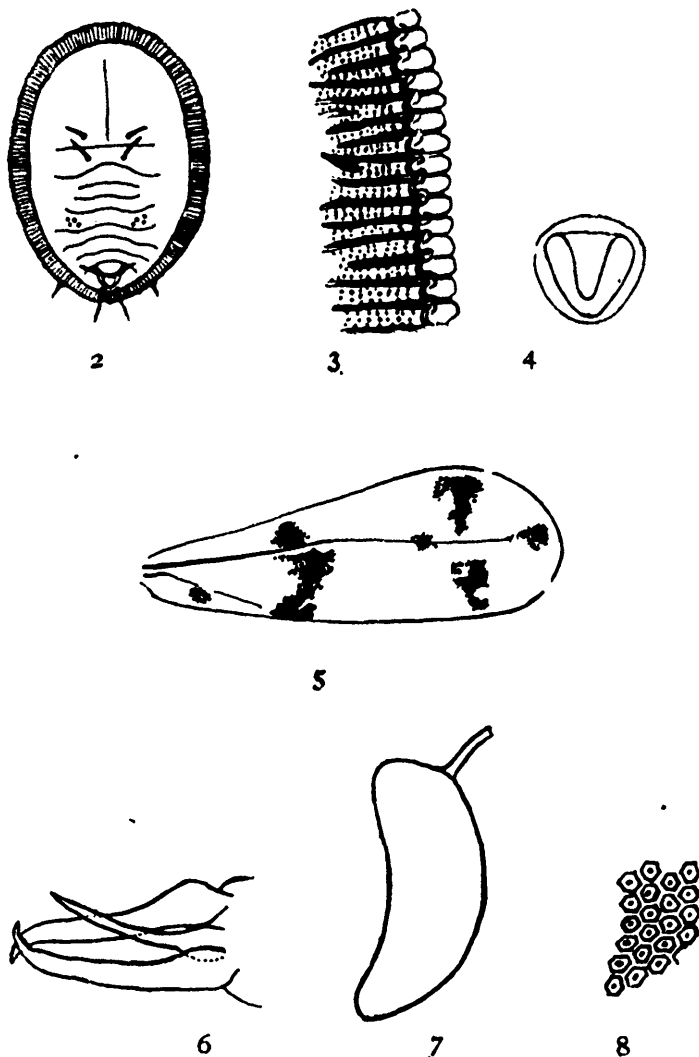
*Pupa-case*.—Length, .7 mm ; width, .55 mm.; shape elliptical, varying somewhat in size and shape. Under hand-lens, shiny black in colour ; dark brown by transmitted light under microscope. Conspicuous white cottony fringe all around ; wax rods, closely matted together at base, distinctly becoming more separated, giving the outer margin of fringe a ragged appearance. There is a distinct marginal rim of wax tubes, which extend mesad with varying distinctness to the inner margin of rim. Outer margin crenulated, due to the shallow and usually rounded indentures between wax tubes ; rim marked with minute dots.

Abdominal segments moderately distinct ; abdomen slightly raised along dorsi-meson, particularly from about the third segment caudad, including vasiform orifice. Third thoracic segment moderately distinct, straight. A median suture extends cephalad to marginal rim from first abdominal segment. On the dorsum of both mesothorax and metathorax

near dorsi-meson is a pair of small brown setæ: also a pair of setæ near vasiform orifice, and on caudal margin of case. This latter pair is usually larger than the others, the setæ extending dorso-caudad, some distance beyond the margin. There is a pair of minute setæ on the margin of case, one on each side, near the caudo-lateral region. On the fourth abdominal segment on each side there is a group of from four to six minute pores. One or two pores are sometimes present on fifth segment on each side, just caudad of those on fourth. Vasiform orifice somewhat elevated, small, sub-elliptical, wider than long. Operculum nearly filling orifice; cephalic edge straight, lateral and caudal margins parallel with margins of orifice. Lingula rather short, not reaching margin of operculum. Rudimentary feet on ventral surface distinct.

*Adult*.—♀. Length about .8 mm.; length of front wing, .833 mm.; width of front wing, .3 mm.; length of antennæ about .25 mm.; length of hind tarsus, .16 mm.; length of hind tibia, .28 mm. Colour, bright yellow; tarsi and distal end of tibiæ more or less reddish; eyes deep brownish-red, varying to brownish-black. Wings all around on margin reddish, deepest on cephalic margin of first pair. First pair of wings spotted with bright red and brownish-black; two irregular red spots near proximal third, one on each side of the main vein, the smaller spot on cephalic side; caudal spot irregularly T-shaped. There are three or four brownish-black spots on the distal fourth of wing; one at tip, into which the vein merges, one cephalad, and one caudad of vein, with a fourth sometimes present near vein, somewhat proximad of the others; a light clouding may also sometimes occur at base of wing just caudad of basal veinlet.

Antennæ of seven joints. First joint short, sub-conical, not quite one-half length of second; second joint pear-shaped, somewhat truncate distally, about three-fourths as wide as long; third joint long, slender, slightly longer than the distal four together; fourth short, cylindrical, about one-half length of fifth; fifth, sixth and seventh subequal in length; fifth and sixth sub-cylindrical; seventh somewhat fusiform, tapering distally and bearing a terminal seta. Joint third, and distally, rather minutely ringed. In third pair of legs, femur about three-fourths length of tibia. Tarsus and claw together about three-fourths length of tibia. Distal tarsal joint, excluding claw, four-fifths length of proximal. Mentum three jointed; proximal joint long, slender, about six-sevenths length of distal two together; second joint short; third, about a fourth longer than



## ALEURODES MORI, QUAINANCE.

FIG. 2.—Pupa-case, showing structural details.

FIG. 3.—Margin of pupa-case, greatly enlarged.

FIG. 4.—Vasiform orifice, operculum, and angula of pupa-case.

FIG. 5.—Right fore wing of female.

FIG. 6.—Genitalia of male.

FIG. 7.—Egg.

FIG. 8.—Illustrating the polygonal markings on egg.

second. Mentum club-shaped, thickest at distal part of second joint, tipped with black. Rostrum short, conical, bearing three long setæ.

Eyes oblong, constricted somewhat above the centre, giving somewhat of a "dumb-bell" shape. Dorsal tubercle (operculum) when elevated and seen in lateral aspect, conical; lingula long, tapering, covered with minute hairs. Operculum, when not elevated, and seen in dorsal aspect, strongly convex, bearing a row of minute hairs on caudal margin; lingula protruded, reaching considerably beyond operculum. Genitalia acutely conical. Margin of wings delicately beaded all around; beads setate. At base of second pair, on cephalic margin, are seven to nine setæ, four of which are usually paired. Median vein of first pair of wings unbranched, extending almost to distal end of wing; nearer cephalic than caudal margin proximad, but curving gradually caudad in distal half, dividing this part approximately in the middle. A short veinlet arises from base, apparently distinct from median, and extends obliquely to caudal margin of wing.

Length about .58 mm.; proportionately smaller than female. Genitalia forcipate; penis about three-fourths the length of valves; curved, suddenly enlarged at base. In other respects essentially as in female.

This Aleurodid occurs in great abundance on the under surface of the leaves of mulberry (*Morus*) at Tampa, Florida. Figure 1, from photograph, enlarged about two-thirds diameter, will serve to illustrate this. The insect occurs in some abundance at Lake City, on the leaves of various trees, as *Telea Americana*, *Callicarpa Americana*, *Liquidamber straciflua*, *Ilex opaca*, and less frequently on *Persea Carolina*.

Under date of April 26th, 1898, Prof. Cockerell sent me specimens of what are doubtless this insect, on a creeper from Kingston, Jamaica.

## ODOUR OF SAN JOSE SCALE, ASPIDIOTUS PERNICIOSUS.

BY F. M. WEBSTER, WOOSTER, OHIO.

In the many accounts of this insect, I do not recall that attention has been called to the odour that is associated with this insect, and which, in cases of excessive abundance, can be detected at a considerable distance away. Where the air is quiet it is often possible to detect the presence of a badly infested tree a yard away, and I presume that with more acute olfactories, such as insects are supposed by many to possess, even the presence of a more limited number of the scale might be detected at a much greater distance. As ants do not appear to be at all partial to this Coccid, at least in this country, it is not easy to understand what influence this odour can have in the economy of the species. It is possible that, in its native home, this odour might attract other insects and thus afford a means of diffusion, not at present so available to the scale in this country.



## FIVE NEW COCCIDÆ.

BY EDW. M. EHRHORN, MOUNTAIN VIEW, CAL.

*Ripersia arizonensis*, n. sp.

♀ enclosed in a broadly oval snow-white waxy sac, about 3 mm. long, 2 mm. wide,  $1\frac{1}{2}$  mm. high, sac widest between middle and caudal end.

♀ oval, about one-third longer than broad, shiny, light purplish-brown, about 3 mm. long. When boiled in K. H. O. turns reddish-brown. Derm colourless, with numerous bristles scattered over the dorsum. Antennæ 6-jointed: 6 longest, joint 4 shortest; formula, 6, 1, 2, 3, 5, 4. Each joint with several hairs, joint 6 quite bristly. Legs light brown, quite stout. Femur longer than tibia. Tibia very little longer than tarsus. Tarsal digitules long fine hairs. Claw slender and curved, digitules of claw very short and slender. Anal lobes prominent, with very long bristle at tip, and several stout ones on its margins. Anal ring large, with 6 bristles. *Hab.*—In ants' nest on the roots of *grass* and *Artemisia*, sp., Camp Thurber, Grand Canyon of the Colorado, Arizona.

[This peculiar insect may form the type of a new sub-genus, *Cryptoripersia*, Ckll., which will be distinguished by the possession of a complete subpyriform brittle sac. The following measurements in  $\mu$   $\mu$  will assist in the recognition of *Ripersia arizonensis*: Anterior leg: femur, 116; tibia, 83; tarsus, 6c. Antennal segments: (1) 41, (2) 33, (3) 33, (4) 25, (5) 33, (6) 61.—T. D. A. CKLL.]

*Kermes ceriferus*, n. sp.

♀ scale globular, about 4 to  $4\frac{1}{2}$  mm. in diameter, ground colour brown, shiny, dotted with black spots. Scale completely covered with dirty white wax. Segmentation obsolete, only indicated by black markings. Ventral slightly pubescent. After boiling in K. H. O., derm colourless, with numerous small round glands and brown spots. Antennæ very small, joints obscure, last joint with numerous hairs. Legs quite stout, claw curved.

*Larva* about twice as long as broad, reddish, turning yellow when dead. Eyes red. Antennæ 6-jointed: joints 3 and 6 about equal, joints 1 and 2 equal, and 4 and 5 equal. Formula (63)(12)(45). Rostral loop reaching half way between last pair of legs and tubercles. Legs large and stout. Tarsus twice as long as tibia. Claw long and curved. Margin of each segment with stout curved spine. Caudal tubercles very large, each bearing one very long bristle and three stout spines.

*Hab.*—On *Quercus*, sp. Walnut Creek Canyon, near Flagstaff, Ariz.

*Ripersia villosa*, n. sp.

♀ in clusters and single in the crotches of twigs of oak. Sac loosely woven of long white wool, oval, about 2 mm. long and 1 mm. broad.

♀ when removed from sac bright crimson, slightly covered with white powder, skin shiny; about 1.5 mm. long, 1 mm. broad, tapering anteriorly and quite convex dorsally. When boiled in K. H. O., derm colourless, densely covered with slender hairs. Antennæ light brown; 7-jointed. Joint 7 longest. Sometimes joint 1 is next longest, but joint 2 is often longer than 1, and in many cases they are subequal; joint 6 usually next, although joint 3 may be longer than 6; joint 4 next, often subequal with 5; sometimes 3 shortest, sometimes 5; 3 and 5 often subequal. In fact, the sequence of the joints is quite variable, as is shown in the following antennal formulæ:

721(36)(45)

7(12)6(45)3

71264(53)

7(12)64(53)

Joint 1 is stouter than any of the others. Each joint with hairs, joint 7 with several stout hairs. Legs light brown, large and stout; each joint furnished with one or more rather long bristles. Femur,  $80 \times 50 \mu$ . Tibia,  $70 \mu$ . Tarsus,  $50 \mu$ . Claw,  $20 \mu$ . Digitules of claw knobbed, moderately short and stout. Tarsal digitules long, fine, slightly knobbed hairs. Tubercles small and rounded, with long stout bristle. Anal ring with six stout hairs.

*Larva* when newly hatched, colour light red, rostral loop extending beyond body.

*Hab.*—On *Quercus agrifolia*, at Berkeley, California.

[This species is probably most nearly allied to *Dactylopius Quintancii*, Tins., from which it differs in being more distinctly a *Ripersia* in the general appearance of both the antennæ and legs.—J. D. TINSLEY.]

*Dactylopius formicarii*, n. sp.

♀ small, broadly oval, slightly covered with powder, about 2 mm. long and 1 mm. broad. Colour yellowish-brown; when boiled in soda, turns red. Epidemis of dorsum with scattered spinnerets and hairs on thorax; on abdomen these become more numerous posteriorly, especially the hairs, which are quite numerous on the last 4 segments. Ventrally the long slender hairs are quite numerous on all the segments, but especially so on

the last abdominal segments. Sides with rows of spinneret spine areas. Antennæ 8-jointed in some, 7-jointed in others, nearly concolorous with the body. Joint 8 longest; next is 2, joint 1 usually next, although 3 may be longer; 5 next, always appreciably longer than 7; 6 may be either shorter or longer than 7; 4 always shortest.

Many of the antennæ are 7-jointed through failure of the 3rd to divide; the 3rd is always then quite long. Formulæ:

$$8\text{-jointed} = 82135764.$$

$$7\text{-jointed} = 7321456.$$

The joints of the antennæ bear very long, rather stout, hairs.

Legs stout and quite hairy. Femur shorter than tibia. Tibia, 215  $\mu$  long. Tarsus, 110  $\mu$  long. Claw rather stout, 37  $\mu$  long. Digitules of claw fine knobbed hairs reaching beyond claw. Tarsal digitules long slender hairs. Caudal lobes small, rounding, with one very long (200  $\mu$ ) stout bristle and several shorter ones, also numerous round glands. Anal ring large, with 6 moderately long hairs.

*Hab.*—*In ants' nests* on the roots of *Artemisia*, sp. Thurber's Camp, Grand Canyon of the Colorado, Arizona.

[Antennal formula approaches that of *D. solani*, Ckll., but the great hairiness of the body and antennæ readily separate it from that species.—J. D. TINSLEY.]

*Kermes Pettiti*, n. sp.

♀ scale about 4 mm. broad, 3 mm. long, and 3 mm. high, dark purplish-brown; some individuals of a lighter colour and marbled with brown. A distinct longitudinal groove on the meson indicated by a dark line. Surface without minute black specks. Segmentation not very distinct, indicated by rows of black spots plainly seen through a pocket lens. Ventral surface, where it touches the bark, flattened and more or less covered with a yellow secretion. Beak very prominent. When removed from twig scale leaves a whitish powder. When boiled in K. H. O., derm colourless, except numerous brown spots with black centres scattered over the dorsum. Antennæ very obscurely 6-jointed, joint 3 apparently longest. Legs very small and stout. Tibia as broad as long, with a stout spine. Femur and tibia about equal. Tarsus nearly twice as long as tibia. Claw straight.

*Hab.*—On *Quercus*, sp.; Ithaca, N. Y.; sent to me by Mr. R. H. Pettit as *K. galliformis*, Riley. I take pleasure in naming this species after the collector. Specimens have been examined by Mr. Cockerell, who agrees that they represent a new species.

## PAPILIO AJAX, VAR. MARCELLUS, IN BRITISH COLUMBIA.

I have lately received from Mr. C. De Blois Green a painting, natural size, of a butterfly which is undoubtedly *P. Ajax*, var. *Marcellus*. Mr. Burton, the captor, took the specimen on the Cowichan River, near Duncan's, in Vancouver Island, where he spends part of every summer fishing. It was upon one of these expeditions that the specimen referred to was taken, and another one was seen during the same summer, but not secured. The painting which was afterwards made by his wife is well done, and there is no doubt at all about the species. Mr. Burton formerly collected insects in England, but has not exchanged with anyone in the United States, or even had a collection in his possession for many years. There is hardly a possibility, therefore, that any mistake has been made as to the actual locality where this specimen was caught.

A point of considerable interest is, What was the food plant of the larvæ of these butterflies? The Papaw, which is, as far as I know, the only food plant, does not grow in British Columbia, nor, as far as I am aware, further west than Nebraska.

I shall be obliged if any reader of the CANADIAN ENTOMOLOGIST can give any further information on the food plants of this species, or suggest any probable food plant upon the Pacific coast.

J. FLETCHER.

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DESCRIPTION OF A NEW PSILOPA.

BY D. W. COUILLETT, WASHINGTON, D. C.

*Psilopa petrolei*, new species.

Black, polished, not light coloured, pruinose except the lower part of the occiput, cheeks and sides of face, which are thinly grayish pruinose; halteres yellowish, the knobs white. Eyes densely hairy, most approximate at middle of face. Third joint of antennæ slightly longer than the second, the spine of the latter not reaching beyond the apex of the antennæ. Wings hyaline, tinged with gray on nearly the costal half, except sometimes a spot toward apex of the submarginal cell; apex of second vein nearly twice as far from the first as from the apex of the third vein. Length, 2 mm.

Described from eight specimens reared from larvæ living in crude petroleum near Los Angeles, Cal.

Type No. 4,100, U. S. N. M. This description is published at the request of Dr. L. O. Howard, who has prepared an article on the habits of the insect.

## LIFE-HISTORY OF THE SHEEP SCAB-MITE, PSOROPTES COMMUNIS.

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

I am not aware that the full life-history of this insect has been published, though I shall not be surprised to learn that such is the case.

In order to know how long a time should intervene between the first and second dippings for the cure of scab, we must know the period of incubation and also the entire time elapsing from the deposition of the egg up to the time that the mite from that egg, if a female, may be itself depositing eggs. These points were determined in a series of experiments conducted by the writer one year ago and were reported in a local paper, the "Fort Collins Courier," last spring. I took seventy-five eggs from a lock of wool drawn from the back of a badly infested lamb, and, after dividing them in two nearly equal lots, placed them at once on the skin of the backs of two lambs that were not infested with the mites at the time. In order to irritate the surface a little and better prepare it for the little mites that would begin at once to hatch, a lock of wool was drawn in each case from the particular spot where the eggs were placed.

Mr. Ball, assistant in my department, made a careful examination of these "cultures" once a day until the mites from the eggs were fully grown and themselves laying eggs.

At the first examination a few young mites were found, which was to be expected, as a few eggs among so many would be about ready to hatch. At the end of the fourth day all the eggs had hatched. At the end of the ninth day a few individuals were found in copula; and on the eleventh day eggs were found. As it required four days for the newly deposited eggs to hatch, the entire time elapsing from egg to egg would be fourteen or fifteen days.

As there would be eggs in all stages of incubation upon a sheep when the latter is dipped for the cure of scab, I have set the limit of time for the second dipping at not sooner than five days, and not later than ten days after the first dipping. If the second dipping comes at a time outside this limit, there will probably be eggs upon the sheep again.

## AMERIA TEXANA, FRENCH.

From a comparison with an example recently sent me by Mr. Harrison G. Dyar, from the Smithsonian Institution, I find that this is synonymous with *Pagara simplex*, Walker. *Ameria texana* will then be known as a synonym.

G. H. FRENCH.

ASPIDIOTUS FERNALDI (CKLL.), SUB-SP. COCKERELLI,  
SUB-SP. NOV.

BY PERCY J. PARROTT, MANHATTAN, KANSAS.

♀ scale nearly circular, somewhat flattened, little convex, roughish, dark gray above bark, reddish-brown below bark, 2 mm. diameter; exuviae little exposed, often concealed by whitish secretion, orange, placed to one side of centre; ventral scale, delicate and white; old scales dark brown, often almost black. Scales are thickly massed.

♀ oval, white, marked with irregular light yellow spots; first and second lobes, and margin of last segment, yellowish.

Five groups of ventral glands; median 2 to 5, cephalolaterals 11 to 18, caudolaterals 7 to 18.

Two pairs of well-developed lobes; the mesal somewhat oblique, with one notch on lateral margin; the second pair somewhat angular and inclined to mesal lobes, notched on margin; dark, unequal processes mesal of mesal lobes and sides of incisions, those mesal of first incision large and conspicuous (Fig. 9.)

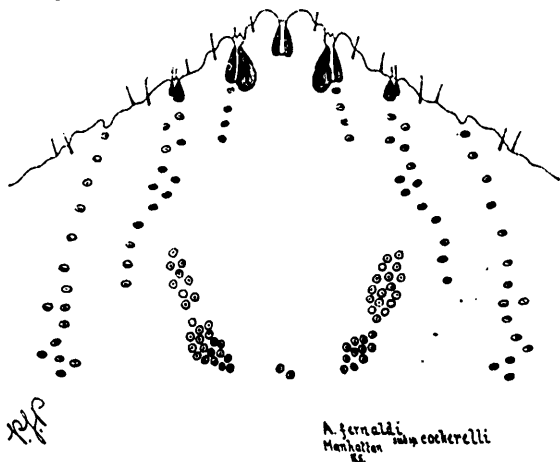


FIG. 9.—Characters of female. (Original.)

One small spine on lateral of mesal lobes, two conspicuous ones on margin of 2nd pair of lobes and lateral of 2nd pair of incisions, respectively.

Plates simple, often undiscernible; when present, one or two caudad of each incision,

Very common under the rough bark on the trunks of maples in Manhattan, Kans. Collected Sept. 18, 1898.

"The species is closely allied to *Aspidiotus Fernaldi*, Ckll., which occurs on honey locust in Massachusetts, but differs from it by the narrower, notched, median lobes and the more numerous glands in the groups."

It is with the greatest pleasure that I dedicate this species to Prof. T. D. A. Cockerell, who first led me to study the Coccidae, and has given me his valuable assistance and encouragement while studying them. I am also indebted to him for the quoted passages, which I have taken from his manuscript.

Scales were collected from Juneberry in the same vicinity as the maples, which intergrade between the maple insect and *Fernaldi*. "They constantly agree with the maple species in having many glands in the groups, but some have lobes as in the maple species, while others have lobes just as in *Fernaldi*. (Fig. 10.) Some of the Juneberry specimens



FIG. 10.—Variations of characters of females from scales on Juneberry. (Original.)

can only stand as *Fernaldi*, var., for they differ in no tangible character except the rather more numerous glands in the groups." The number of spinnerets for the Juneberry specimens are as follows: median, 2-3; cephalolaterals, 8 to 18; candolaterals, 8 to 13. In exterior appearance the scales resemble the maple specimens, but are not so numerous nor so evenly distributed, being found in small separate clusters. Collected in Manhattan, Kans., July 23, 1898.

## A NEW BUTTERFLY FROM UTAH.

BY HENRY SKINNER, PHILADELPHIA, PA.

MELITÆA MARIA, n. sp.—Male: Expands  $1\frac{1}{2}$  inches. Upper side. Primaries. The outer margin of the wing has along its edge about eight brick-red spots; internal to these is another row of yellow spots, separated from the former by a very small space. Next comes a row of yellow spots, the first four having an outward curve, and the lower three an inward curve. There then comes a row of quadrate brick-red spots, nearly parallel to the preceding yellow row. At the end of the cell are three yellow quadrate spots. The cell has in it two comparatively large red spots, outlined with black, and having a yellow patch between them and another toward the base. There is also a quadrate yellow spot with concave sides in the space below the third median nerve. The secondaries are marked in a similar manner.

Under side. Primaries. These are light brick-red, with two spots in the cell of the same colour encircled with a black line; beyond the cell are three oblong yellow spots; still further toward the tip are two rows of yellow spots edged with black. The lower half of the wing is immaculate, with the exception of a yellow dot below each median nerve. On the secondaries are about six rows of spots, the rows being alternately red and yellow, narrowly edged by black. The female is somewhat larger and darker in colour, having less yellow on it. This species belongs to the *Anicia* group, but is lighter in colour than the other species, having more yellow spots. The wings are also narrower. The under side is light in colour, similar to *Acastus*. Described from a number of specimens taken at Park City, Utah, June 26th, 1895, by Prof. A. J. Snyder, and named in honour of his wife, who is an ardent collector and student of the Lepidoptera.

## A SERIOUS ATTACK ON THE APPLE FRUIT, BY ARGYRESTHIA CONJUGELLA (ZELL.) IN EUROPE.

BY ENRIO REUTER, HELSINGFORS, FINLAND.

In the annual reports of the Canadian Experimental Farms for 1896 and 1897, Dr. James Fletcher describes a new apple-fruit pest in British Columbia, caused by the attacks of small caterpillars, viz., the larvæ of a little tineid moth, *Argyresthia conjugella*, Zell. The injuries done by this new enemy, called by Mr. Fletcher "the apple-fruit miner," closely resemble those caused by the apple maggot, *Trypeta pomonella*, Walsh.



The caterpillars tunnel the pulp of the fruit in every direction, leaving brown-coloured channels with rather large chambers here and there; this attack thus being easily distinguishable from that of the common codling worm.

According to Mr. Fletcher, this apple pest has not previously been noticed in America, and Lord Walsingham, of Thetford, England, that well-known microlepidopterologist, to whom a specimen was sent for determination, states that *Argyresthia conjugella* in Europe feeds on the fruit of *Pirus (Sorbus) aucuparia*, but has not been recorded from *Pirus malus*. At least no injury of this insect on apples has, as far as I know, until now been observed in Europe.

Last summer, however, an apple pest, quite similar to that described by Dr. Fletcher, has been injuriously abundant in Finland, the apple fruits in almost every orchard having been very seriously injured by small caterpillars and often completely spoiled for use. There can be little doubt that these caterpillars are the larvæ of *Argyresthia conjugella*, one of our commonest tineids.

The unexpected and violent attack of an insect, not previously known in Finland as an enemy to the apple fruit, is peculiar enough, but I think it will be a matter of still greater interest, since we may be able to point out the cause of this phenomenon.

The caterpillar, as stated above, ordinarily feeds in our country on the fruits of the Mountain Ash (*Sorbus aucuparia*), and sometimes also on those of the Bird Cherry (*Prunus padus*). In 1896 and 1897, especially in the latter year, the Mountain Ashes bore fruits in uncommonly great abundance, which was an extraordinarily great advantage for the multiplying of the insect. But this summer the fructification of the Mountain Ash, as well as of the Bird Cherry, almost *totally failed throughout Finland*. *The insect could not find its ordinary food, it must try to obtain another, and the egg-laying moths, swarming in immense numbers, instinctively flew to the apple trees to lay their eggs.*

In a letter recently received, Dr. Fletcher informs me that this insect during the past season was again very destructive to fruits in British Columbia, and, although he could not confirm it, he was told that the prunes were attacked as well as the apples. If this were really the case, the fact stated above, that the larvæ attack also the Bird Cherries, seems to be of considerable interest.

Prof. M. Matsumura, of Sappora, Japan, has described<sup>1</sup> an injury to apples caused by another little tineid belonging to the family *Lavernidae*, and probably to the species *Laverna herellera*, Dup. In a footnote Dr. L. O. Howard<sup>2</sup> suggests that this insect may be identical with *Argyresthia conjugella*, and that the Japanese insect has been introduced into British Columbia. To judge from the figures, drawn by Prof. Matsumura, of this Japanese insect, and especially of an apple infested by it, and considering, further, the description given by the same author, the Japanese insect certainly does not seem to be identical with our Finnish *Argyresthia conjugella*. The injury caused by *Argyresthia conjugella* on the apple fruits, as described above, is, in fact, quite different to that of the Japanese insect. Dr. Fletcher also points out in his letter that the figure given of the Japanese insect and the description of its work do not quite agree with the Canadian *Argyresthia*.

The injury of *Argyresthia conjugella* is, indeed, a very characteristic one. As this apple pest appears in quite a similar manner in two countries geographically so widely separated as British Columbia and Finland, and as, further, both these attacks are of quite a different nature from that caused by the Japanese insect, we must conclude that the Japanese pest is not identical with that occurring in Canada and Finland.

### THE BITE OF OTIORHYNCHUS OVATUS.

BY JAMES FLETCHER, OTTAWA.

*Otiorrhynchus ovatus* is an insect which, during the last decade, has become decidedly more numerous in Canada than was formerly the case. Little seems to be known about its habits. It has been sent to me occasionally with complaints of its attacks upon various crops. Among these may be mentioned injuries to the growing stems of potatoes, and also injuries to fruit in the fruiterer's shop. The beetles have been also sent in frequently as having been found in considerable numbers huddled together in dwelling houses late in the autumn. Perhaps the most interesting complaint which has been made comes from Prof. W. L. Goodwin, of Queen's University, Kingston, who writes: "I send two specimens of a small beetle which caused so much annoyance in camps on Wolf Island, in the St. Lawrence, near Kingston, Ontario, in July last. It attacked us at night and bit with unpleasant severity." Upon writing to Prof.

1. M. Matsumura. Two Japanese insects injurious to fruits in: Bull. No. 10, new series, U. S. Dep. of Agric., Div. of Entom., Washington, 1898, p. 36-38.

2. Loc. cit., p. 37.

Goodwin for exact particulars, and to the suggestion that he might possibly have been mistaken as to the identity of this nocturnal assailant, the following letter was received :

"As to our experience of last summer, there can be no question as to the guilt of *Otiiorhynchus*. I was awakened several times by the pain of the bite, and caught the culprit red-handed, and having crushed him safely to destroy his powers of locomotion, I laid him in a safe place to identify him the next morning. The bites are very painful, as compared with those of other pests. They itch for a long time, and do not heal sometimes for a week or two. I examined the mouth of our little enemy with a microscope, and concluded that it was a biting mouth and not a piercing mouth. The other members of our camp were also attacked. The beetles were found constantly in our bed clothes, and there can be no doubt, I think, as to this apparently acquired habit."

ON THE RELATIONS OF A SPECIES OF ANT, *LASIUS AMERICANUS*, TO THE PEACH ROOT LOUSE, *APHIS PRUNICOLA*.

BY F. M. WEBSTER, WOOSTER, OHIO.

Some years ago, Dr. Erwin F. Smith\* called attention to the fostering of this aphid by a species of ant, *Lasius claviger*, and, although not able to actually witness the act, his studies of the actions of this ant about the roots of peach trees infested by this aphid led him to believe that the former brought the latter from below ground in spring and placed them upon the twigs, thus indirectly if not directly causing their diffusion in orchards.

This *Aphis prunicola* is quite abundant in some localities in Ohio, and I have observed it on the twigs of peach trees as late as early December. Having lately had occasion to study this insect on the roots of young peach trees, I was, equally with Dr. Smith in his previous observations on this aphid, very strongly impressed with the attention given them by ants, in my cases this being *Lasius americanus*, Em.

Not only have I been able to observe the attentions of this ant in caring for the aphid on the roots, but also found them transporting them about on the twigs, and, while I too was unable to witness the actual transportation of the aphid from root to twig, I have no doubt that it is done and also that this transportation is carried on from twig to root. If we examine closely it will be observed that this ant burrows down about

\*Entomologica Americana, VI., pp. 101-103 : 201-207, 1890.

the bases of young peach trees from the surface of the ground to the crown, and when the soil is somewhat heavy and packed closely about the base of the tree, these burrows are excavated close to the bark, which is here very soft and tender, and in some cases even the bark itself has been gnawed away, thereby giving the surface an irregularly grooved appearance, but clearly marking the directions of the burrows. This disposes of the question of the ability of this ant to excavate in the tender bark of the roots and about the crown of young peach trees.

Below ground I always find this aphid clustered on the most tender roots or rootlets, as stated by Dr. Smith, and with ants in constant attendance, promptly removing their wards whenever these are brought to light by my digging. But in cases where there was a lack of rootlets, a condition of affairs was encountered that was alike perplexing and interesting. The bases of some of the roots, and also the crown, had patches of bark removed and the wounds had every appearance of having been caused by the gnawing away of the bark, the detached bits intermixed with the escaping sap being present, and the most persistent search failed to reveal any organism capable of doing this, except the ants, of whose ability to gnaw the tender bark of the lower portion of the tree there was ample evidence between the crown and the surface of the ground. The object of these wounds, however, did not appear clear to me until on further examination it was found that where these wounds had begun to heal over, the lips thereof were closely packed with root lice, attended by this ant. It appears that this aphid can subsist from this tender growth of over-healing bark, as well as if they were colonized on the tender rootlets, and in the former case they may be observed collected along the edges of the wound precisely as does *Schizoneura lanigera*, about the overgrowing bark on the apple, in cases of wounds caused by a pruning off of a large limb. Where the wounds on the peach roots were infested by the aphid all bits of gum and detached bark had, seemingly, been removed, thus leaving a clear area for the work of the aphid, and here as elsewhere the ants were carefully looking after them.

When we come to recall the influence of other species of ants, and especially other members of this genus *Lasius*, on other species of aphides, it is impossible for me to escape the conclusion that we here have ample grounds for accusing *Lasius americanus* with intentionally gnawing the bark on the roots in order to furnish a supply of food for *Aphis prunicola*, Kalt., where there is a lack of rootlets for the required pasturage.†

†Read before the Ohio State Academy of Science, December 29, 1898.

## A SOUTHERNER ARRESTED IN CANADA.

Towards the end of November last I had occasion—as I so frequently have—to test the patience and endurance of Dr. J. B. Smith, in order to obtain the names of some *Noctuids* taken here last summer; which he promptly determined and returned. In his letter to me accompanying the list of names, he says amongst other matters: “But let me ask of you what do you know concerning No. 11? This is *Acontia aprica*, var. *biplaga*. It is a very common species in Texas and in the South-west generally, and it has been found North as far as Southern Missouri; but I have never seen it any further North or East of that. Is there any chance of a mistake in the locality? This northward extension, if actual, would prove very interesting; but I must confess I am distinctly skeptical,” which under such circumstances he was quite justified in being, and in requiring proof of its right to bear the London label. There are in Ontario two species of this somewhat extensive genus *Acontia*, (*Tarache*) *crastroides* and *candefacta*, which are present every season and nowise rare; but I have never heard of any other species of the genus as having been taken in it.

My evidence to the genuineness of the capture here is that Mr. Bice was at the time I got it constantly going the rounds of his daily occupation, and that he is not in communication about insects with anyone outside the city to get it from abroad. I saw him turn it with other things out of his cyanide bottle, which he told me were taken in a closed globe; that is, one closed at the bottom, where small specimens get quickly dried up, and have to be relaxed before they can be pinned with safety. I secured it there and then; relaxed it, pinned and spread it with special pleasure, because it was to me such a novel and attractive specimen. Dr. Smith acknowledged my answer to his question and considered the evidence satisfactory.

Such a find as that is well calculated to throw theories of distribution and exactly laid out Faunal Zones into confusion; but these, like all other human systems, are rigid things in comparison with nature's elastic methods of dividing up the surface of the globe to best suit its own interests. Life in nature rebels against being hedged in by lines of latitude and longitude, and insect life particularly. Many interesting questions are started by such a departure from the ordinary routine of human observation and experience. Missouri is a long way from here. Did that specimen come direct from there to here? It seems very

unlikely. Did it get here by shortened stages and lengthened time through several generations? That starts the question of food plant, what it is, and can it be obtained between there and here? Latitude might thus arrest its progress, at least its permanent progression that way. I have often wondered why insects, which I have every reason to believe were in a locality, could not be got; and am impressed with the idea that there must be many in a locality where one is got, and that some may be in localities where none have yet been seen; and when one is taken in such localities we are apt to conclude that it is the only one that ever was there.

It was in the autumn of 1881 that I took my first specimen of *Heliothis armiger* at Hamilton. An. Rep. Ent. Soc. of Ont., 1881, p. 30. And Dr. Saunders, then of London, now of Ottawa, assured me that up to that time he had not taken it. It was considered then to be but a transient visitor; now it could be taken here in numbers every season, although reported as injuring corn for the first time last season—a good illustration of how a migrant establishes itself in a new locality where its favorite food plant is easily obtainable. And others may be doing the same, of whose presence we have as yet had no indication.

The other species new to the Society's collection of that sending were:

*Bryophila teratophora*, H. S.

*Manestra anguina*, Grote.

*Schinia trifascia*, Hub.

*Galgula subpartita*, Guen.

J. ALSTON MOFFAT, London, Ont

As a postscript to the above, I will now notice another of Mr. Bice's rare finds. Amongst the *Hydracia* sent to me by Mr. H. Bird, Rye, N. Y., was a handsome specimen of *H. Necopina*, Grote, which Mr. Bird said was considered by many to be a mythical species until he discovered its food plant, and secured it in sufficient numbers to distribute freely. Mr. Bice called and saw the specimens; looked at them long and intently; pondered much, but said little. He went home and turned over his more recent captures, called a few days later with a box in his hand, which I took and opened; and there, to my surprise and delight, was a *Necopina*; lacking the lustre of the other, but quite unmistakable. Mr. Bird's specimen recalled something he remembered taking, but said nothing about it until he should see, for fear he might be mistaken.

J. A. M.

## NOTES ON THE AMERICAN FORMS OF EUCHLOE, HÜBN.

BY A. G. BUTLER, PH. D., BRITISH MUSEUM, LONDON, ENGLAND.

Dr. Beutenmüller, in his recent revision of the species of *Euchloe*, notes the fact that the neuration of this genus is variable, but he appears not to have been aware that the variation is so frequent that no division of the genus based thereupon has any value. In his three groups, *Euchloe*, *Midea* and *Anthozharis*, there are not only species differing in the number of veins in the primaries, but individuals of the same species differ in the same way.

Another point in Dr. Beutenmüller's definition of his groups requires consideration: he speaks of vein 9 as being present or absent, whereas a careful examination of the position of the veins must make it evident that vein 9 is never absent, but that veins 7 and 8 frequently coalesce or are conterminous. This is quite certain, from the fact that in all species which normally possess 11 veins only in the primaries, the twelfth vein occurs abnormally as a furcation of vein 7: thus, in *Midea lanceolata*, which usually has only eleven veins, vein 7 is sometimes forked near the distal extremity, though with a shorter fork than is usually seen in *Euchloe Sara*; nevertheless, some examples of the latter, and particularly in the smaller varieties, *E. Reakirtii* and *Julia*, have only 11 veins.

Dr. Beutenmüller places *E. pima* and *E. methura* under *Midea*, although, excepting in the absence of the fork to vein 7 (or, in other words, in the absence of vein 8), they agree far more closely with the species of *Zegris*.

Some of the white species of *Euchloe* have 11 and others have 12 veins to the primaries, whilst the second subcostal branch (vein 10) varies considerably in its position in the same species, being emitted before, at or after the end of the discoidal cell.

As regards *E. creusa*, I believe it to vary seasonally as much as its very close ally, *E. ausonia*; the attempt to distinguish between *E. ausonides* and *E. hyantis* looks to me like a failure, not that they cannot be readily distinguished by size, form of secondaries, depth of ground-tint, and size of white spots on under surface, but because these differences are also to be seen in undoubted seasonal variations of the European form, *E. ausonia*, and because if *E. ausonides* is distinct from *E. hyantis*, the Vancouver form, which differs in the pattern of the under surface, has an equal claim to separation. As regards typical *E. creusa*, which Dr. Beutenmüller considers to be *E. hyantis*, I can definitely assure him that the type (which we possess) agrees with his *var. elsa*.

My idea of this species is that it can be arbitrarily sorted out into seven graded forms: *E. ausonides*, *E. var.* from Vancouver, *E. hyantis*, *E. lotta*, *E. coloradensis*, *E. creusa* = *elsa*.

*Euchloe olympia* is undoubtedly a species of *Zegris*.

## BOOK NOTICE.

THE BUTTERFLY BOOK.—A popular Guide to a knowledge of the Butterflies of North America. By W. J. Holland, D. D., Chancellor of the Western University of Pennsylvania, etc., Pittsburg, Pa. : 1 vol., 4to., pp. 382.

[Price, \$3.00, postage prepaid. Copies may be procured from the author, or William Briggs, 29-33 Richmond Street West, Toronto.]

It is with great pleasure that we announce the publication of this beautiful popular work on the Butterflies of North America. Hitherto the vast number of young people who begin collecting insects have had their enthusiasm sorely chilled by their inability to find names for their specimens, and have in consequence soon given up the pursuit in despair. Now there need be no difficulty as far as the butterflies are concerned. In the handsome volume before us there are no less than forty-eight beautiful coloured plates, produced by a new process from photographic representations of specimens from the author's cabinets, and on them are depicted over a thousand butterflies, belonging to 527 species. The colours are remarkably true to nature, and a child should have no difficulty in identifying any specimen that he may capture from the plates alone. In the letterpress brief descriptions are given, first of the characteristics of the genus in all its stages, with a wood-cut showing the neururation, and then of each species, setting forth the colours and markings, size, etc., of the butterfly, the early stages where known, and the geographical distribution; references are also given to the works of Edwards, Scudder, and other authors, where fuller information can be obtained. As an introduction to the work, illustrated chapters describe in a popular and interesting manner the life-history and anatomy of butterflies, how to capture, prepare and preserve specimens, their classification and the principal books that have been published upon them in North America. Interspersed through the volume are short papers, for the most part of an amusing character, in which the author varies the monotony of descriptive matter by telling some of his experiences or relating some interesting facts regarding these beautiful creatures. We heartily commend the work to our readers, and earnestly hope that it may become widely distributed amongst all lovers of nature throughout North America.