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GRANARY INSECTS.

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Every year, in the United States and Canada, thousands of dollars worth of stored grain is ruined by granary insects, chiefly of three species. These are all well known, and much has been written concerning their habits and the methods by which they can be destroyed. Besides the three very injurious species, the Granary Weevil, the Rice Weevil and the Angoumois Grain Moth, which are responsible for most of the damage done, there are a great many other kinds of insects which do serious harm to stored grain and various other edible products. All of these insects are spoken of popularly as "weevils," but the only true granary weevils are the two mentioned above.

The power of granary weevils to destroy grain, when held for any length of time in stores or warehouses, is enormous. These insects are not natives of North America, nor is it at all likely that they will ever increase sufficiently in Canada, where we have such cold winters, to do very serious injury. It is true they occasionally destroy samples or small quantities of grain kept in heated offices or stores, but this injury cannot compare with their ravages in hot climates, particularly in India and South Africa. In the Southern States they do an enormous amount of damage every year, and it has been estimated of Texas alone that there is an annual loss of over a million dollars. Grain infested by these insects loses in weight, is useless for seed, and is unfit for consumption by human beings or live stock.

THE GRANARY WEEVIL (*Calandra granaria*, L.).

This beetle, as well as the two other insects mentioned in this short article, has long been known as a serious enemy to stored grain. When mature, the Granary Weevil is from an eighth to a sixth of an inch in length, of a dark shiny mahogany brown colour, with the head prolonged into a slender snout. Some specimens are almost wholly black. Having no wings beneath the hard wing-cases, it is unable to fly. The eggs are laid in minute holes, which the female beetles bore into the grain with

their slender beaks. On hatching from the egg the young grub at once begins to feed on the contents of the kernel, completes its growth and turns to a beetle inside the same grain, which does not show any sign of injury until the beetle emerges, when it is found that the greater part of the inside has been consumed. In wheat and other small cereals a single larva inhabits a grain, but a kernel of corn furnishes food for several individuals. The mature beetles also feed upon the grain, and live for a long time, so that in warm places where grain is kept in store for a length of time, the injury may be considerable. In the course of a single year it has been estimated that one pair of these weevils will produce 6,000 descendants, so it can be readily seen that they are capable in a short time of doing much damage.

THE RICE WEEVIL (*Calandra oryzae*, L.).

This insect differs somewhat in size and general appearance from the Granary Weevil. Unlike that species, it possesses fully-developed wings, has two yellowish blotches on each wing-case, is slightly smaller and of a pale brown colour. The life-history of this insect is similar to that of the preceding species, except that in very warm climates the beetles are often found in fields away from any granary, and in the extreme South and in the Tropics the females lay their eggs in standing grain. The Rice Weevil is often found injuring stored grain in company with the Granary Weevil.

THE ANGOUMOIS GRAIN MOTH (*Sitotroga cerealella*, Ol.).

In Canada the Grain Moth has never developed sufficiently to be considered an important enemy of stored grain. In Southern climates, however, where it is very abundant, this insect is a bad pest. The moths fly from the granaries to the field and lay their eggs upon standing grain. The eggs, or young caterpillars are thus carried with the threshed grain into the granary, where they develop and cause great loss. The moths, however, have not so far been recorded as laying their eggs upon standing grain in Canada, and where damage has occurred, it has been to infested grain which had been imported. The eggs are deposited in groups of from 15 to 25, generally upon the under side of the grain or in the crease of the kernel. They are white at first, turning pink before hatching. The young caterpillar is a minute creature, slender, and covered with long hair. When mature it is 2.5 of an inch in length, and of a dirty white colour. As a rule only one larva enters each grain, but when corn is attacked, two or three larvæ may be found in a single kernel. After

completing its growth the caterpillar spins a thin silken cocoon, and within this changes to a brownish pupa; in a few days later the moth emerges. The perfect insect resembles somewhat a clothes moth. The wings expand about half an inch, are of a satiny cream colour and bear a few dark spots on the fore wings, which are narrow, pointed and fringed. The hind wings are darker and have much wider fringes.

Remedies.—When stored grain is found to be infested by one of the above three insects, or, in fact, by any insects which are known to work in dry cereals, it is a simple matter to destroy them. After repeated experiments, it has been found that the use of bisulphide of carbon will kill all the insects without any injury to the grain as to its wholesomeness for food, or as to its germinating quality for seed. Bisulphide of carbon is a colorless liquid with a very objectionable odour, which vaporizes quickly at the ordinary temperature of the atmosphere. A convenient method for treating small quantities of infested grain, is to fill an ordinary coal-oil barrel, which will hold about five bushels of grain, and the quantity of bisulphide to use is one ounce to every hundred pounds of seed. The bisulphide may be poured right on to the grain or placed in a shallow receptacle, but care must be taken to close up the top of the barrel tightly. This is best done with a cap made specially for the purpose, but may also be done with fine sacks laid smoothly on the top, over which boards are laid, with a considerable weight on them to hold the covering down closely. When grain in bins is being fumigated with bisulphide of carbon, these should be made as nearly air-tight as possible. This may be done by pasting sheets of paper over the outside, or by covering them with blankets or canvas. In tight bins the amount of bisulphide to use is a pound to a pound and a half to the ton of grain. Some entomologists claim that one pound of bisulphide to every 100 bushels of grain is sufficient to destroy all insects, even in open bins. Infested grain should be subjected to the fumes of bisulphide of carbon for at least 48 hours, but as the vapour is very inflammable, no light of any kind must be brought near and no smoking must be allowed near the building when this chemical is being used.

In Queensland it has been found that salt (1 quart dissolved in 2 gallons of water) will prevent weevils from attacking grain which has been sprinkled with this solution.

• SOME NEW OR LITTLE-KNOWN BEES.—V.

BY CHARLES ROBERTSON, CARLINVILLE, ILLINOIS.

Prosopis eulophi, sp. nov.—♀.—Front coxæ simple; eyes long; cheeks narrow; metathorax with a distinct enclosure bordered by a raised line; dorsal segment 1 minutely punctured, without lateral white pubescent fasciæ; black; flagellum testaceous beneath; pale yellow marks as follows: lateral face marks about equally narrowed above and below, two lines on collar, tubercles, dot on tegulæ, bases of tibiæ, and base of hind metatarsus; wings hyaline; length 5 mm.

♂.—Resembles the female, but the flagellum is more testaceous and the abdomen, especially dorsal segment 1, more distinctly punctured; face narrowed nearly one-half below; scape broad; face below antennæ whitish, on the eye margin pointed as high as middle of scape; yellowish marks as follows: anterior tibiæ in front, middle and hind tibiæ at base and apex, tarsi, two lines on collar, tubercles, dot on tegulæ; length, 4-5 mm.

Carlville, Illinois; 10 ♀, 9 ♂ specimens.

Trypetes productus, sp. nov. *Trypetes barbatus*, Trans. Am. Ent. Soc. 29: 171, 1903, ♂.

This does not belong to the female described under the name of *T. barbatus*. It can be distinguished from the male of *T. carinatus* by the ventral segment 1 being produced to a point; shorter antennæ, with joint 3 more than one-half as long as 4; flagellum darker; clypeus more strongly bearded.

Carlville, Illinois; 10 ♂ specimens.

Osmia collinsie, sp. nov. *Osmia major*, Ent. News, 13: 79, 1902, ♂.

Evidently this insect, described from one specimen, is not the male of *O. major*. It is likely to be mistaken for the male of *O. atriventris*. It runs a little larger; ventral segment 2 more finely punctured, its apical margin rather densely pubescent; hind metatarsi unarmed; length 8-10 mm.

Carlville, Illinois; 10 ♂ specimens.

Andrena salictaria, sp. nov.—♀. In size, structure, colour and habits this specimen closely resembles *A. Illinoensis*. It is a little more slender; scutel minutely roughened and opaque; scutel and disc of mesonotum usually more purplish; fasciæ on segments 2-4 more whitish, July, 1903.

thinner, more interrupted on 2; basal process of labrum shorter, more rounded; second submarginal cell usually relatively shorter compared with third.

♂. Differs from the male of *A. Illinoensis* by the scutel being finely rugose and opaque, often without purplish; apex of abdomen rather pointed and with a small tuft; ventral segment 6 not reflexed; hind tibiae and tarsi more frequently yellowish.

Carlinville, Illinois; 39 ♀, 47 ♂ specimens. *A. Illinoensis* has the scutel smooth and shining. The ♀ type specimen has the fasciae on segments 2-4 quite thin and white, but fresher specimens have the fasciae more dense, more ochraceous and hardly interrupted on 2. The male of *A. Illinoensis* has the sixth ventral segment reflexed and bordered with dense pubescence, so that the apex of the abdomen appears to be open, the orifice densely pubescent, the apex thus bearing a great tuft.

Andrena nigra, sp. nov. *Andrena Illinoensis* form *bicolor*, Tr. A. S. St. Louis 8: 46, 1898.

This is more nearly related to *A. salictaria* than to *A. Illinoensis*. Peculiarities in its time of flight and flower visits seem to make it desirable to separate it as a distinct species. The name refers to *Salix nigra*, the only flower on which I have found it collecting pollen. *A. Illinoensis* and *salictaria* are likewise oligotropic visitors of *Salix*.

A NEW ROACH FROM PORTO RICO.

BY A. N. CAUDELL, WASHINGTON, D. C.

Ichnoptera adusta, n. sp.—Description—Male: Colour dark yellowish, with eyes black and the disc of the pronotum slightly mottled with fuscous and the tips of the elytra and wings fuliginous. Anterior femora beneath on the inner margin armed on the apical two-thirds with about ten semiequal, equidistant spines, the basal third unarmed. Subgenital plate roundly incised apically; apical styles long, slender rigid spines extending about half their length beyond the apex of the subgenital plate; cerci long, fusiform.

Length, pronotum, 3.5; elytra, 15; width pronotum, 4 mm. Type number 8400, United States National Museum.

One male, Arroyo, Porto Rico, at light, Feb., 1899; Aug. Busck, coll.

The infuscated apices of the elytra and wings of this Roach will serve to identify it readily, and the armature of the fore femora and the rigid anal styles are different from most American species.

OBSERVATIONS ON LAMPYRIDÆ.

BY FREDERICK KNAB, URBANA, ILL.

Two species of fire-flies are abundant in western Massachusetts in the early summer and often their display of light presents a magnificent spectacle. These species are *Photinus scintillans*, Say, and *Photuris Pennsylvanica*, De Geer. *Photinus scintillans* becomes active very early in the evening, and long before twilight begins its orange-coloured light may be seen flashing among the shrubbery. It is only active during the twilight hour and some time before total darkness has set in its lights have disappeared. This species frequents localities with abundant shrubbery, and often congregates in certain copses or on the margin of the woods, while other similar situations are almost deserted. Even in larger towns, where there are gardens with shrubbery, it may often be seen in some numbers.

The other species, *Photuris Pennsylvanica*, is the most abundant of all the fire-flies. It makes its appearance in the late twilight and its display of light continues far into the night. Its light is more brilliant than that of the first mentioned species and of a distinctly greenish colour. This species is partial to low, moist situations, and is particularly abundant on low meadows bordering rivers. In the time of their greatest activity, when thousands are sending forth intermittent flashes, they offer a spectacle beautiful beyond description.

It occurred to the writer that the difference in the colour of light of these two species of fire-flies might possibly be one of optical effect, rather than an actual difference. While the light of *Photinus scintillans* appeared bright orange and that of *Photuris Pennsylvanica* a pronounced green, no comparison could be made, for the two forms do not display their light at the same time and place. Perhaps the light of *Photinus scintillans* appeared orange simply in contrast with the bright green of the vegetation, still plainly visible at the time of the beetle's appearance, and, indeed, then of a more pronounced colour than under the strong light of full day. This supposition was strengthened by the fact that when one of these insects was brought into the yellow light of a kerosene lamp, its own light, by contrast, appeared of the characteristic phosphorescent greenish colour. One evening specimens of both species were secured and, in complete darkness, were with some difficulty induced to emit their light simultaneously. It was then seen that the light of the two species is very much alike and of a greenish colour, that of *Photuris Pennsylvanica* being of a slightly stronger green.

I cannot leave this subject without some mention of that interesting form, *Phengodes*. A few years ago the writer found a larva of *Phengodes plumosa* under a stone near Mount Tom, Massachusetts. It emitted light of a brilliant blue colour at the sides of the body segments. Apparently both the larva and the larviform female of some of the tropical species of *Phengodes* and related genera emit light of two colours, as has been reported by a considerable number of observers. In these forms the head, or the region immediately behind it, glows in a brilliant red light, while points along the body segments shine in a white, yellow, green or blue light. Some of these forms are certainly the larviform females, but it seems that the larva also emits exactly the same kinds of light. The reader will find a most interesting account of these luminous forms, accompanied by many bibliographical references, in a paper by Dr. Erich Haase in *Deutsche Entomol. Zeitschrift*, vol. 32, p. 145-167. The forms found in North America appear to be rare, or at least very local, and our knowledge of them is still very incomplete. It is to be hoped that observers will take every opportunity to make observations on these remarkable forms. Gondot (*Revue Zool.*, 1843, p. 17) states that the male *Phengodes* also is brilliantly luminous, and Haase asserts that the male of his *Phengodes hieronymi* emits a greenish light from the under side of the abdomen. The only male of *Phengodes plumosa* which the writer has seen alive certainly gave forth no trace of light, though this does not prove that it may not be luminous at certain times. This specimen was captured at twilight, near Holyoke, Mass., as it flew rapidly across a road through the woods. The date of capture, May 30th, is at variance with the observation of Thomas Say, published in the *Boston Journal of Natural History*, vol. 1, p. 157. Under *Phengodes plumosa* he there remarks: "Not uncommon for a short period in the autumn. Attracted by the candle, they enter the house in the evening and fly repeatedly against the ceiling in their efforts to escape."

THE GENUS *VENUSIA* AND ITS INCLUDED SPECIES.*

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

Probably everyone will agree with Dr. Pearsall's remarks in the April number of this journal as to the necessity for a revision of the North American Geometridæ. The whole group is in a sad state of disorder; the old species are not all well understood and many of the newer ones

*See Pearsall, *CANADIAN ENTOMOLOGIST*, XXXVII, 125, April, 1905.

(Dr. Hulst's and Dr. Strecker's), being unfigured and insufficiently described, are very difficult to identify. It will be some time yet, I fear, before anyone will be in a position to attempt a complete monograph, and probably it will be better to take up the work genus by genus, as Dr. Pearsall is doing.

With regard to the new genus *Nomenia*, I have carefully examined all the specimens in my collection from California, Nevada and British Columbia, which, according to the nomenclature of Dr. Dyar's Catalogue, would stand under the name *Venusia duodecimlineata*, Packard, but I cannot find among them any that possess the antennal structure described by Dr. Pearsall.

This does not, of course, prove that the genus *Nomenia* is not a good one, but it shows that *not all* the California so-called *12-lineata* belong to it, and so until Dr. Packard's original types (from California) can be examined it will be doubtful whether the name *12-lineata* should be attached to the *Nomenia* or to the ordinary form. The genus *Venusia* as Dr. Pearsall points out, is represented in North America by a single species, *V. cambrica*, Curtis. The other species listed by Hulst under *Venusia*, form with *Euchæca lucata*, Guenée, a distinct and natural group. But I am afraid we have not yet got these quite correctly named in our lists.

My good friend Mr. L. B. Prout, of London, is very carefully going over, on my behalf, Walker's type specimens in the British Museum; and he tells me that the type of *Tephrosia? comptaria*, Walker, (from Nova Scotia), is certainly not a specimen of *L. perlineata*, Packard, as Hulst supposed, but a *12-lineata*, Packard—eastern form.

I think, therefore, that the name *Euchæca comptaria*, Walker, must be used for the eastern, British Columbia and the bulk of the California specimens of *12-lineata*, Packard. The species now called *Comptaria* will retake its former name *E. perlineata*, Packard, and *Euchæca lucata*, Guenée, with *condensata*, Walker, as a synonym, will complete the group.

I would therefore list the species referred to as follows :

- Venusia cambrica*, Curtis.
- Nomenia 12-lineata?*, Packard.
- Euchæca comptaria*, Walker.
 - = *12-lineata*, Packard (part).
 - = *salienta*, Pearsall.
- Euchæca perlineata*, Packard.
- Euchæca lucata*, Guenée.
 - = *condensata*, Walker.

I may add that the type of *inclinataria*, Walker, (= *inclinata* Hulst), placed by Hulst in the synonymy of *comptaria*, is a specimen of *Xanthorhoe ferrugata*.

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

BY F. H. WOLLEY DOD, MILLARVILLE, ALTA., N.-W. T.

(Continued from page 230.)

373. *Cosmia discolor*, Walk.—(*paleacea*, Esp., of North American authors, in error.) Common in 1903, ♂♂ Aug. 31st to Sept. 23rd; ♀, only one observed, Sept. 7th. A single specimen only (♂) taken previously, in 1895. A few during 1904. Treacle.

374. *C. punctirena*, Smith (? = *infumata*, Grt.).—Common in 1903, in about double the numbers of *discolor*; ♂♂ Aug. 8th to 22nd; ♀♀, common, Aug. 7th to Sept. 5th. A few specimens in 1899 and 1904. Treacle.

[Note.—*C. paleacea*, Esp., has probably never been taken in N. America.]

The above synonymy is merely tentative, as I dare not risk any definite reference without a personal inspection of types. I only purpose for the present to try and make clear my reasons for claiming that we have two North American species which have long been confused with, but are distinct from, the European *paleacea* of Esper. The dates given above are for 1903 only. The earliest dates represent absolute first appearances, and the latest are fairly indicative of the duration of each.

Of *discolor* I have under examination 32 ♂♂ and 7 ♀♀, of which 2 ♂♂ are from Kaslo, B. C., 3 ♂, 4 ♀ from Cartwright, Man., 3 ♂, 1 ♀ from Aweme, Man., and a specimen without abdomen, but apparently a ♀, from Franconia, N. H. The balance are Calgary specimens. Expanse of males, one 38 mm., the rest 40 to 45 mm. Females 44 to 47 mm. Colour from a pale straw-yellow to rosy, orange or ferruginous, with generally more or less of a smoky suffusion, but this is never quite uniform and does not tend to obscure the maculation. The t. a. line forms an obtuse, though generally distinctly pointed angle in submedian interspace. It is often scarcely larger than a right angle. The discoidal spots are distinctly, often quite contrastingly, paler than ground colour, the orbicular immaculate, the reniform occasionally so, but often with a smoky shading on its lower border, where the central transverse shade of the wing touches the junction of veins 4 and 5 with the cross-vein at the end of the cell. This shading may sometimes be traced throughout the length of the reniform on the cross-vein, but very rarely tends to form a dark spot on its lower edge as it does in *punctirena* and *paleacea*. The secondaries are very pale

immaculate yellow on the costal region, but have either a smoky or a distinctly pink or rosy shading from the base nearly to the hind margin over the central and lower portion. This shade is often darkest on the veins, and forms a stronger contrast with the costal region than is seen in *punctirena*. The ♀ abdomen is more thinly scaled than is the case with *punctirena*, is longer, and tapers narrowly to a point from which the ovipositor generally protrudes. The type is in the British Museum, and is, Sir George Hampson tells me, "a yellow form, partly suffused with fuscous."

Punctirena was described from Colorado, Wyoming, and Cartwright, Man., and a poor figure accompanies the description. The type is a Cartwright specimen, and is in the U. S. National Museum. I have a ♀ from Ottawa, and a very imperfect specimen, but one of which the identity is beyond question, taken on the summit of Mt. Washington, N. H. In all I have at present under examination 23 ♂♂ and 34 ♀♀, and all but the two above mentioned are Calgary specimens. Expanse of males, one 34 mm., another 44 mm., the rest from 39 to 43 mm. Females 41-45 mm. A description of the colour would sound exactly like that of *discolor*, but whilst the variation in shades of yellow or reddish covers the variation for that species, *discolor* is decidedly the brighter coloured species of the two, but the extreme range of variation in *punctirena* is greater. The colour difference, though individuals can be occasionally matched, is obvious in a series, but hard to express in words. *Punctirena* has the same smoky or fuscous suffusion, but this has a strong tendency to obscure both the ground colour and the maculation, which is not the case in *discolor*. A few specimens appear to be of a uniform smoky-brown ground, with a faint reddish or orange tinge, and as a whole *punctirena* runs very much the darker of the two, and none of my specimens can be called rosy. The t. a. line forms an obtuse, but more or less rounded angle in the submedian interspace. The angle may be pointed, but is generally a larger angle than that formed by the same line in *discolor*. The discoidal spots are more often nearly concolorous, rarely contrasting with ground colour, and there is always a very distinct dark spot on the lower edge of the reniform. This spot is evident even when the rest of the maculation is obscured. The secondaries are duller than in *discolor*, and though they generally have a smoky suffusion throughout their lower portion, the rosy shade never seems to be present, the veins are not distinctly darker, and costal area, though generally paler, does not contrast. The ♀ abdo-

men is hardly more thinly scaled than the ♂, except that the lateral and terminal tufts are absent, is *shorter than in discolor*, does not taper so sharply, and the ovipositor less often protrudes.

In the above descriptions I have only mentioned those characters which I have found to be of value in separating the two species, and have italicized those points which I believe to be of the most importance. As is so frequently the case with closely allied species, it does not seem possible to find any one distinctive character which is quite constant, and though a long series of each at once conveys the impression of distinctness, a few individuals are, I admit, rather hard to place, and differentiation must be sought in a sum total of all the characters. A recapitulation of the points of difference may be useful.

(1) *Discolor* is the brighter coloured of the two, has more of a rosy and less of an orange tendency, and does not run to such dark smoky-brown forms.

(2) The t. a. line in *discolor* is usually not only more sharply angulated, but the angle tends to be pointed rather than blunt or rounded, as it generally is in *punctirena*. Though this difference is perhaps the most obvious of any in a series, it is not constant. It is, however, much easier to find *punctirena* in which the angle is sharp or pointed than to find *discolor* in which it is blunt or rounded.

(3) The discoidal spots are generally more contrastingly pale in *discolor* than in *punctirena*, and though in the latter species they are sometimes contrastingly pale, a concolorous tendency is much more frequent than in *discolor*.

(4) A dark spot in lower portion of reniform in *discolor* is rarely developed to any marked degree, but in *punctirena* it is generally prominent, and often the most conspicuous mark on the wing. This is quite characteristic of the two species as a whole, though as a matter of fact I have *discolor* with a more distinct dot than some of my *punctirena*, which all but lose it.

(5) The secondaries in *discolor* have usually more of a dusky, often rosy shading in their posterior portion, which is sometimes darkest on the veins, and the pale costa contrasts rather strongly. *Punctirena* has dusky, but not rosy, secondaries, with slightly paler, but not contrasting, costa. Either species may sometimes have secondaries almost immaculate, but as a rule they are darkest in *discolor*, except on the costa. This is another conspicuous feature in a series.

(6) In the ♀♀ the abdomen of *discolor* is more thinly scaled than in *punctirena*, is longer, more narrowly tapering, and the ovipositor more often protrudes.

(7) *Discolor* is, at Calgary, slightly the larger species of the two, and during 1903, when both were fairly common, was *quite three weeks later* in appearance, and continued turning up at treacle after *punctirena* was over. This last is certainly not amongst my least important points.

Of European *paleacea*, Esp., (*Euperia fulvago*, Hbn.), I have 7 ♂♂ and 3 ♀♀ from the British Isles, chiefly from Sherwood Forest, Notts, and 6 ♂♂ and 21 ♀♀ bearing labels of numerous other European and some Asiatic localities. If it were not that I feel so confident of the distinctness of *discolor* and *punctirena* in this one locality, I might easily have been deceived into looking upon both as local races or mere varieties of *paleacea*, which combines some of the characters of both. But it combines them in such a way as to bespeak a third species. It comes between them, but without connecting them. In colour it is brighter than either, but in the 37 specimens before me there is much less colour variation even than in *discolor*, and scarcely any tendency to a smoky suffusion. A few specimens of all three can be found to match in colour almost exactly. It varies from a very pale golden-yellow, through straw, to orange. The latter form is, I believe, the var. *angulago* of Haworth, and the var. A. of Guenée. The former, though mentioned in Tutt's "British Noctuae and Their Varieties," Vol. III, p. 19, is entirely omitted from the Staudinger Catalogue, in which, however, an aberration *Trichi* is listed and referred to as a form shaded with fuscous. Colour, however, is not usually of important specific value in forms in widely separate localities. The t. a. line has generally the sharp angulation of *discolor*, which is conspicuous in a series, though a few specimens have it decidedly blunt. The discoidals have a stronger tendency to be concolorous than even in *punctirena*, and the dark spot in the reniform is strongly developed in all my specimens but one, in which the entire maculation is so faint that the spot, though discernible, has almost become obsolete. The secondaries are frequently immaculate, but have sometimes a slight dusky or even pinkish shading in their lower portion. The ♀ abdomen, though scaled as in *punctirena*, is long as in *discolor*, but not quite so sharply tapering. The ovipositor sometimes protrudes. So that *paleacea*, whilst in colour of both primaries and secondaries it cannot be called either intermediate, or nearer to one than to the other, has usually the sharply angulated t. a. line of *discolor*, the discoidal spots of *punctirena*, and a ♀ abdomen somewhat intermediate

between the two, but decidedly tending towards *discolor*. A combination of *discolor* and *punctirena* would make *paleacea* in everything except colour, and the supposed distinctness of the latter from each is based solely upon my confidence in the distinctness of the two former from each other. Dr. Dyar, in his Kootenai list, refers those specimens from Kaslo having the dark spot in the reniform to *paleacea*, those lacking it to "var. *discolor*, Walk." As before pointed out, my use of the names *discolor* and *infumata* are merely tentative. Sir George Hampson tells me that *infumata* is "a gray-brown form," and though he not long ago expressed his opinion to me that *punctirena* was a synonym of *infumata* and *discolor* probably distinct, he has since told me that he considers all four names to refer to one species. Of the published figures of the three species which I have had the opportunity of examining, that in Newman's "British Moths" has not as well developed a dark spot in reniform as *paleacea* usually seems to possess, nor as sharply angulated a t. a. line. I have, however, specimens with a blunter angle, but not with such a constricted, though really a fainter dark spot. As there is no colour guide, it would be quite excusable to say that the figure combined all the characters of *punctirena*. But constriction of the spot is a variation which in all probability occurs in the European species, as it certainly does in *punctirena*, which in that point then approximates an occasional partially developed spot in *discolor*. In Barrett's "Lepidoptera of the British Islands," Vol. V, pl. 223, figs. 2 and 2a, though the dark spots are well developed, the t. a. lines again, in both figures, have a blunter angle than seems usual. But the even, unicolorous appearance of both primaries and secondaries at once bespeaks *paleacea*. The merest glance at Dr. Holland's pl. xxvi, fig. 32, gives the immediate impression of European *paleacea*, exactly, and in every detail. The uniform, slightly orange-yellow primaries, sharply angulated t. a. line, concolorous discoidals, except for the typically well developed dark dot, and the clear immaculate secondaries, combine to make such an excellent representation of the Old World species, that I will be bold enough to assert that it actually does represent *paleacea*, Esp., and is therefore correctly named. But I have so far not seen the species from North America, and I seriously doubt its being a North American specimen. I asked Dr. Dyar his opinion of the figure, and he replied: "I cannot match Holland's figure in my American specimens, though I have about a hundred of them. I have but two European specimens, yet one of them is the exact match of the figure." The figure of the type of *punctirena* in CAN. ENT. XXXII,

pl. 5, is evidently from a very poor negative and therefore of little value. But the rounded bend of the t. a. line (just traceable), the well-developed spot, and the general smoky-suffused appearance, leave me in no doubt about my having the species correctly named. In addition to which I have specimens named by Prof. Smith himself. I have not been able to procure *venosa* for comparison, and the very small number I have succeeded in obtaining from correspondents, though I have been trying for eighteen months, causes me to suppose that neither *discolor* nor *punctirena* are by any means generally common, though they seem to have the same range. I much regret that I have had finally to write this article with so little outside material for study.

375. *Orthosia verberata*, Smith., (CAN. ENT. XXXVI, 153, June, 1904).—Described from two pairs from here. Of these, the type is at Rutgers College, and a pair are co-types in my own collection. Only ten or a dozen specimens have been taken altogether; one in 1904, the rest during 1903. Sept. 11th to 27th; treacle. Under the description the form is stated to be allied to *ferruginoides*, but no comparison is made. Of *bicolorago* and its var. *ferruginoides*, I have a good series from the Eastern States, and two ♂♂ and a ♀ from Cartwright, Man., where I understand from Mr. Heath it is not uncommon. The more usual form is of an orange or rusty, that is a ferruginous, yellow, varying in tint in different specimens, with basal, t. a., and t. p. lines, central shade, and sub-terminal area purplish, though in the palest specimens the purple shadings are very slight. This, Dr. Dyar tells me, is the so-called variety *ferruginoides*. Typical *bicolorago* is a less common form, with a purplish shading over the entire outer portion of the wings, both primaries and secondaries, beyond the central shade, making an obvious colour contrast with the inner portion, which probably suggested its name. I have at least one specimen intermediate between the two forms. Of the three Cartwright specimens, the two ♂♂ are var. *ferruginoides* and the ♀ *bicolorago*, and their place is obviously with the eastern form. *Verberata* is luteous or buff rather than yellow, though a few specimens have a more decided ferruginous tint than any of my *ferruginoides*, and whilst purplish transverse lines and shadings seem always present, I have as yet seen no approach to the *bicolorago* form in the Calgary species. The secondaries are uniformly dark smoky below the subcostal vein, but the costa is pale and contrasts strongly, which is rarely the case with my *bicolorago*, in which the secondaries are, as a rule, much paler. The t. a. line seems

better defined and less coarse than in the older species, the t. p. line less obviously crenulate, and the discoidal spots more clearly outlined and slightly larger. The two series contrast somewhat, and, were they mixed, I feel sure I should not have the least difficulty in picking out every Calgary specimen without the aid of labels. I am inclined to look upon *verberata* as a good species. It resembles the late C. G. Barrett's figures of British *ferruginea* much more than do any of my Manitoba or eastern specimens. I hope soon to have an opportunity of comparing all three forms together. Dr. Dyar, in the Kootenai list, records *bicolorago*, var. *ferruginoides*, from Kaslo. I sent him a Calgary specimen of *verberata*, and whilst questioning its validity as a species, he added, "The Kaslo specimens should be *verberata* if this name holds."

376. *O. euroa*, G. & R.—Not common in 1896, and a few taken in 1897, at treacle. Not met with since. Middle to end of August.

377. *O. Conradi*, Grt.—Fairly common. July and Aug. An extremely variable species, of which I have closely studied a long series. It varies from a very pale luteous to a dark crimson. Some specimens are almost immaculate except for the dark spot in reniform, others have the transverse lines very distinct.

378. *Parastichtis discivaria*, Walk.—Common some years. July and Aug. Treacle. Sir George Hampson has specimens from me. He called what I sent him *gentilis*, Grt., adding, "*Discivaria*, Walk. = *perbellis*, Grt., is, I think, a distinct species." It varies enormously, but I cannot make more than one species out of Calgary material.

379. *Scopelosoma tristigmata*, Grt. Rare. } Sept., Oct. and April and

380. *S. devia*, Grt. Common. } early May, at treacle and
sallow blossoms.

381. *Homoglaea hircina*, Morr.—Generally very rare, but rather common in 1898 and again in 1904. End April and early May. Sallows and treacle. A very variable species.

382. *H. carbonaria*, Harr.—Rare. Oct. and early May.

383. *Ipimorpha pleonectusa*, Grt.—Far from common, but fairly regular in appearance. Middle July and Aug.

384. *Dasympoudea Meadii*, Grt.—Two specimens at light. July 23rd, 1901.

385. *Copablepharon absidum*, Harr.—Two fine specimens at the Calgary town lights, on Aug. 7th, 1902, by Mr. T. N. Willing, through whose kindness one of them is in my collection. The name is on the authority of Dr. Fletcher.

386. *Heliothis phlogophagus*, Grt.—Rare. End May and June. Flying in sunshine.
387. *Schinia cumatilis*, Grt.—Three specimens. July 21st to Aug. 2nd, 1900 and 1903. Light.
388. *Melanoporphyrta Oregona*, Hy. Edw.—Not common. Middle June to middle July. A day-flyer.
389. *Melicleptria septentrionalis*, Hy. Edw.—Rather more common than the preceding. Middle May to middle July. Also a day-flyer. Sir George Hampson treats this as a synonym of European *ononis*, Fabr. Superficially this and the preceding species are rather alike, and might easily be confused by one who was not acquainted with the range of variation. Among the several points of difference which I have found constant, perhaps the most obvious is that the reniform in *septentrionalis* is outlined posteriorly by a broad black line, never present in *Oregona*.
390. *Heliaca diminutiva*, Grt.—One specimen, flying in sunshine, June 9th; 1897.
391. *Polychrysis trabea*, Smith.—Described from here, and figured with description. The type is at Washington. Decidedly rare, but fairly regular in appearance. Middle July to middle Aug. Light. This species is referred by some, including Dr. Dyar, to Oberthür's var. *esmeralda* of *moneta*, Fabr. So far I have seen nothing written on the subject whatever, beyond Dr. Dyar's listing, and a few vague suggestions in private letters. *Moneta* appears to be common in some parts of Europe, and is also stated to occur in Siberia, and the mountain districts of Central Asia. It was not taken in the British Isles previous to 1890, but has since been of fairly regular occurrence in some of the south-eastern counties of England, though very far from common. The var. *esmeralda* seems to differ from the typical form in being of a yellowish-white colour instead of golden-yellow, and Mons. Oberthür says in the description: "It has exactly the same markings (as typical *moneta*) except so far as concerns the bent extrabasal line below the median nerve of the superior wing. This line is double in *moneta*, simple in *esmeralda*." The var. is stated to be not uncommon in Amurland (Siberia). I have two British specimens of *moneta* in my collection, through the kindness of Mr. L. B. Prout, of London, Eng. They differ from Alberta specimens in being decidedly richer in colour, and have the maculation better defined. The inner portion of the t. a. line, evident in the British specimens, has a tendency to become obsolete in the Calgary form. The secondaries in the latter are

also a little paler. I can see nothing to separate them as species, but a comparison of five North American specimens with two European is hardly a fair basis from which to arrive at any definite conclusion, and I therefore follow Prof. Smith. In Europe *moneta* is partially double brooded, and the larva feeds on *Aconitum napellus* (Monkshood), *A. lycoctonum*, various species of *Delphinium* (Larkspur), and *Trollius Europæus* (Globe flower). My information concerning the European species is all derived from Barrett's "Lepidoptera of the British Islands," Vol. VI, p. 102-107, and Tutt's "British Noctuæ and their Varieties," Vol. IV, p. 20-23. The new-world form is figured as *moneta* in Dr. Holland's book, and the figure is an excellent one. It is there stated to occur in Assiniboia as well as Alberta, but so far as I know it has not yet been turned up elsewhere. The type is at Washington, and is figured in Ent. News, Vol. VI, pl. xv, December, 1895, and described in Vol. VII, No. 1, of that magazine. Its sex is not stated. Sir George Hampson accepted the species as *trabea* without comment.

392. *P. purpurigera*, Walk.—Very rare. Light and at dusk. Aug.

393. *Plusia æroides*, Grt.—Not common. Middle July and Aug. Light.

394. *Euchalcia venusta*, Walk.—Rare. Middle July to middle Aug. Light.

395. *E. Putnami*, Grt.—Fairly common. July and Aug. Light. The species is referred by Dr. Dyar as a var. of European *festuæ*, Linn., a fairly common European species. I have four British *festuæ*, which differ from Calgary specimens chiefly in being darker and having larger metallic spots, and a golden metallic spot at base of primaries, not present in any of a large number of *Putnami* I have examined. In my *Putnami* the two central spots are often joined, which I believe is seldom, if ever, the case with *festuæ*. I find it stated by Mr. Tutt that Guenée claimed to have seen a North American specimen exactly like the European species. Dr. Ottolengui, in his paper on *Plusia* (Journ. N. Y. Ent. Soc. X, p. 57-82 and pls.), suggests the possible existence of two or even three species known as *Putnami* on this continent. The north-west form is certainly less like *festuæ* than *trabea* is like *moneta*.

396. *Autographa mappa*, G. & R.—Two specimens, July 24th, 1898, and July 22, 1903. Probably at light.

397. *A. bimaculata*, Steph.—Fairly common. Middle July and early Aug. Dr. Ottolengui believes the north-west form to be either a July, 1905.

geographical race or else a new species. I have no material from other localities.

398. *A. Californica*, Speyer—Common. I have records from May to September. I believe it hibernates here, and is almost certainly a migrant. *Ou* seems to be a closely allied species of which I have two specimens from Louisiana, Mo., sent me as such by Mr. Henry Engel. I see differences, but as they are not very strongly marked I dare not risk a comparison without more material. Dr. Ottolengui in his notes on "Plusia and Allied Genera" (Journ. N. Y. Ent. Soc. X, 57-82, June, 1902), states that the two are quite distinct.

399. *A. pseudogamma*, Grt.—Not common. Middle July and early Aug. There seems to have been a good deal of confusion in the past between this and the preceding species. I had both named for me by Prof. Smith some years ago, and his determinations were corroborated by Dr. Ottolengui at the time he wrote his paper. The differences between my two series are also in accordance with Dr. Ottolengui's figures, which, however, are unfortunately not clear enough in detail to bring those differences out plainly. Of the two, *Californica* has the most acute apices. It has far less of the greenish or bronze lustre seen in *pseudogamma*, and is much more reticulated in appearance, chiefly owing to the transverse lines being more clearly marked and more irregular, though actually finer. One of the most constant points of difference is seen in the outer margin of primaries. In *Californica* the lunulate dark terminal line is duplicated by another at the base of the fringes, and preceded by a third, finer and more direct one, in the terminal space. It has thus the appearance of being treble. In *pseudogamma* the terminal line is obviously single and less lunulate, and though bordered anteriorly by a narrow shade of the pale ground colour, is not preceded at a short distance from it by a fine and separate line as in *Californica*. Dr. Holland's figure standing as *pseudogamma* is not sufficiently clear to bring out points of difference with any exactness, but from the distinctive characters in the terminal area which I have just pointed out, there can be little doubt that the specimen figured is really *Californica*. *precatonis* is a species which, until I obtained and compared a good series, I had considerable difficulty in separating from *pseudogamma*. There is a difference in the sign, I admit, the upper portion being more open in *pseudogamma*, but unless I have more than one species under *precatonis*, the sign seems a much more variable character in this than in most of its allies. It is really a brighter coloured species, with more of a bronze or coppery lustre, and has finer transverse lines.

400. *A. flagellum*. Walk — Redescribed from here by Prof. Smith as *insolita*, of which the type is at Washington. It is figured in Ent. News, VI, Pl. XV. Not common, but regular in appearance. Middle July and Aug.

401. *A. rubidus*, Ottol.—Four ♀♀ only. Two are in my collection. One is dated July 2nd, 1901, and was the first I ever saw. It has been seen by Dr. Ottolengui, and is a good specimen. The other, dated June 26th, 1903, is badly rubbed. A ♀ from here is in the U. S. National Museum, and another is in the British Museum. At first sight it might be taken for an aberrant *pecationis* or *pseudogamma*, but amongst other differences it is easily distinct from both by the sign, which runs to a rather sharp point posteriorly. It was described from Cartwright, Man., and St. John, N. B., and a good figure is given with the description. The type is a ♀ in Dr. Ottolengui's collection.

402. *A. alias*, Ottol.—I have a ♂ from Blackfalds, Alta., about a hundred miles north of Calgary, taken by Mr. Gregson on July 28th, 1902, which bears Dr. Ottolengui's label, and has been seen by Sir George Hampson. The species is stated by its author to be common throughout Canada and the Northern States, and to have been confused with *u-aureum*, whilst resembling *rectangula*. *U-aureum* is now dropped from our lists as not North American. The type is a ♂ in Dr. Ottolengui's collection. I have two Pine Creek specimens dated Aug. 9th and 16th, which I should say are undoubtedly the same species, and a fourth from St. John, N. B., which was sent me a few years ago as *mortuorum*. All agree with the two figures of *alias* given in Dr. Ottolengui's paper. One Didsbury (Alta.) and two Pine Creek specimens show some slight modifications in the sign, but after much study I have not been able to satisfy myself that they differ specifically. I sent one of these to Sir George as possibly *excelsa*, and he returned it labelled *octoscripta*. It is certainly not unlike Dr. Ottolengui's figure of that species, which, however, is not clear in detail. It bears date Aug. 21st, 1903, and the others are dated Aug. 7th and 9th, 1903-4.

403. *A. excelsa*, Ottol.—I have the name only, but Dr. Ottolengui tells me that he has at least three specimens from me. One of these is a ♂, taken at light on Aug. 29th, 1895, and was named *angulidens* for me by Prof. Smith some years ago. The two species are stated to be very much alike, but separable amongst other differences by the sign, which in the present species is rather V-shaped, and in *angulidens* more like a U. It has the same range as *alias*, whereas *angulidens* appears to be

exclusively confined to Colorado. I have a badly-rubbed specimen from Field, B. C., which I take to be this species. The type is a ♂ in the collection of Dr. Ottolengui.

404. *A. epigaea*, Grt.—Two ♂♂ July 29th, 1898, and Aug. 21st, 1903, and a ♀ July 27th, 1904, the latter marked "dusk," are all I have in the collection. It was only when finally touching up these notes for sending to press that I noticed that I had two species under *ampla*, and after a careful comparison with Dr. Ottolengui's figure, I have little doubt that the three I have picked out are *epigaea*. Once recognized as distinct, their difference is rather obvious. The ground colour is dark silvery ashen gray, without the obvious purplish shading of *ampla*. There are no blackish marks near apex and anal angle as in *ampla*, and the t. p. line is not bordered anteriorly throughout its length by black, and does not meet the inner margin quite so near the anal angle, which in this species is more obviously falcate. One difference in the sign appears to be that in the present species its inner portion touches the median vein on the t. a. line, whereas in *ampla* it touches it at a point slightly further from the base. This holds in my specimens, and is seen even more clearly in Dr. Ottolengui's figures, but the slight variation in my short series of both leads me to doubt its constancy. It is quite probable that I have sent away a few as *ampla*.

405. *A. ampla*, Grt.—Rare. I have only six specimens at present in the collection, bearing dates from July 7th to Aug. 6th. Light.

406. *A. falcifera*, Kirby.—Fairly common. End June to early Sept. Flying in daytime and at light. One specimen quite fresh on May 8th, 1900. Dr. Ottolengui's paper tells us that *falcifera* is the gray form of the species, and "was described from Nova Scotia, and it is noteworthy that in the north the brown form is rare." *Simplex* is the darker, brown form, and "was described from New York, where the brown form is common." The majority of Calgary specimens fall between Dr. Ottolengui's figures of the two forms, and I have nothing quite matching either of those extremes, but some are darker than Dr. Holland's figure, though less red. Though distinctly brown specimens occur, the general tendency is towards gray, at the expense of brown. By far the grayest specimen I ever saw was a Regina specimen of Mr. Willing's, dated June 16th, 1904.

407. *A. diasema*, Bdv.—A single ♀ flying in sunshine on Sulphur Mt., Banff, Aug. 13th, 1900, at a little over 5,000 feet, has been seen by Dr. Ottolengui.

(To be continued.)

MANITOBA MICRO-LEPIDOPTERA.

BY W. D. KEARFOTT, MONTCLAIR, N. J.

(Continued from page 208.)

Exentera apriliansa, Grote.—Aweme, IV, 30, to V, 21; Beulah. Thirteen specimens. This is a particularly interesting capture. Grote's description* is remarkably brief, and his generic description, occurring on the same page, is misleading on account of an error. He states: "Hind wings 7-veined, 5 wanting." I know of no Tortricid genus in which 5 is absent; frequently 3 and 4 are coincident or stalked for their entire length, but even this is not the case in any one of these specimens; 3 and 4 are stalked from a quarter to a half. Prof. C. H. Fernald kindly examined his type specimen, given him by Grote, and advises that in this specimen, which is a female, veins 3 and 4 are stalked for half their length, vein 5 present, bent strongly towards base, and arising close to origin of 3+4. It is exceedingly doubtful that Grote's genus will stand. The specimens are dark grayish-fuscous, almost immaculate, but with more or less obsolete-darker, narrower fascia from middle of costa to angle, and the basal area defined by an oblique line rising out of dorsum at inner quarter, but lost above middle of wing. Hind wings pale gray. Expanse 15. to 20. mm. Fore-wings narrow and outer margin rounded, not indented.

Proteopteryx columbia, Kearf.—Aweme, VII, 14. One specimen, agreeing with the type of the darkest form.

Epinotia incarnana, Haw.—Aweme, VII, 31. (Europe and California.)

Epinotia fasciolana, Clem.—Aweme, VI, 6 to 10; Beulah. (Maine to Penna.)

Epinotia liturana, Wlsm.—Cartwright. Type from California, not since recorded.

Epinotia imbridana, Fern.—Rounthwaite, July; Aweme, VI, 9, to VIII, 12. This has been a MS. name for many years. Dr. Fernald promises to have the description in print before this appears.

Epinotia pseudotsugana, Kearf.—Rounthwaite, Aug.

Epinotia lindana, Fern.—Rounthwaite, Aug. (Canada, Mass.)

Ancylis mediofasciana, Clem.—Aweme, VI, 6; Beulah, VIII, 15; Winnipeg. (No. Atlantic States.)

Ancylis nubeculana, Clem.—Rounthwaite, Aug. (No. Atlantic States.)

Ancylis laciniana, Zell.—Rounthwaite, June; Aweme, VI, 16 to 25. (Type from Mass.)

*CAN. ENT., IX, 227, 1877.
July, 1905.

Ancylis comptana, Froel.—Aweme, V, 21. Supposed to be the same as the European strawberry leaf-roller and pest.

Ancylis dubiana, Clem.—Rounthwaite, June. (Type from Virginia.)

Ancylis augulifasciana, Zell.—Rounthwaite, Aug.; Aweme, V, 21, to VI, 14. (Maine to Ohio.)

Ancylis plagosana, Clem.—Aweme, V, 21 to 29; Beulah. Described from specimens collected in Labrador, not recorded since; a most interesting new record.

Ancylis diminuata, Kearf.—Aweme, V, 21; Winnipeg.

Enarmonia prunivora, Walsh.—Aweme, VII, 6. (Missouri to Minnesota.)

Enarmonia lautana, Clem.—Aweme, IV, 29, and V, 1. (Virginia and Texas.)

Enarmonia gallealicyana, Riley.—Aweme, VI, 6 and 25; Rounthwaite, June and August. (New York to Texas.)

Enarmonia nigricana, Steph.—Rounthwaite, June. This is the species, the larvæ of which are sometimes quite injurious to cultivated peas, common to Europe, and supposed to have been introduced into America.

Hemimene simulana, Clem.—Aweme, VII, 25. (Atlantic States.)

Acleris nivisellana, Wlsm.—Aweme, IV, 30, to V, 14. (Maine to California.)

Acleris simpliciana, Wlsm.—Aweme, VI, 10, and X, 12. (New Hampshire and Oregon.)

Acleris pulverosana, Walk.—Beulah, May and July. Type from Hudson's Bay, not since recorded.

Acleris hastiana, Linn.?—I have, not only from Manitoba, but from all parts of North America, several hundred specimens, representing the most diverse and bizarre varieties, that may finally find lodgment under this name. I have also a number of European specimens representing a number of varieties. I do not feel able, at this time, to pass judgment on the species, and the only way the question will ever be satisfactorily solved will be by extensive breeding and inbreeding. So far as I know, none of the species of this genus are borers in stems or roots, all leaf tyers and crumplers, hence for any one with the time and opportunity, extensive breeding operations are not difficult. Meyrick gives the European food-plant as "*Salix*" (willow). I have bred several of the so-called varieties from huckleberry.

Epagoge sulfureana, Clem.—Beulah, VII, 15; Rounthwaite, July.

The very pale canary yellow form, with the oblique lines reduced to three or four red dots, hind wings pale fuscous. (Atlantic States.)

Cenopsis reticulatana, Clem.—Aweme, VII, 27, to VIII, 12; Cartwright, VIII, 12 to 28; Rounthwaite, July. (Atlantic and Southern States.)

Cenopsis Pettitana, Rob.—Cartwright, VII, 22, to VIII, 14. (Atlantic States.)

Sparganothis senecionana, Wlsm.—Cartwright, VIII, 8. (California and Oregon.)

Sparganothis irrorea, Rob.—Rounthwaite, July; Aweme, VII, 9. (Maine to Colorado.)

Sparganothis breviornatana, Clem.—Winnipeg. I have long series, both male and female, of this species, as well as *S. xanthoides*, Walk., and can see no reason for uniting them.

Sparganothis puritana, Rob.—Rounthwaite July. (No. Atlantic States.)

Sparganothis vocaridorsana, Kearf.—Aweme, VII, 10; Winnipeg; Rounthwaite, July.

Archips rosaceana, Harris.—Aweme, 16 males and no females, VII, 1, to VII, 27; Cartwright, both sexes; Rounthwaite, July. (Northern United States.)

Archips purpurana, Clem.—Aweme, VII, 27 to 27. (No. Atlantic States.)

Archips cerasivorana, Fitch.—Cartwright, VIII, 4, to IX, 8. (Northern U. S. and California.)

Archips semiferana, Walk.—Rounthwaite, July. (Atlantic States to Colorado.)

Archips fervidana, Clem.—Cridle, VIII, 3 and 12; Beulah, VII, 15, to VIII, 15. (No. Atlantic States.)

Archips fractivittana, Clem.—Winnipeg. One specimen, paler yellow than eastern examples, the oblique brown band almost obsolete, and represented only by a small dot on costa, a larger blotch at anal angle, and a medium size spot midway between them. (So. Atlantic States and Ohio.)

Archips afflictana, Walk.—Winnipeg, V, 17. (Northern States and California.)

Archips virescana, Clem.—Rounthwaite, July. (Common all over North America.)

Archips glaucana, Wlsm.—Aweme, VII, 22 to 31; Beulah, VII, 15. Described from So. Oregon, not since recorded.

- Archips Clemensiana*, Fern. Rounthwaite, Aug. (Maine to Wisconsin.)
- Archips persicana*, Fitch.—Rounthwaite, July; Aweme, VI, 25, to VII, 12; Cartwright, VII, 11. (North Atlantic States and Canada.)
- Platynota sentana*, Clem.—Rounthwaite, July; Aweme, VII, 2 to 12. (Maine to Texas.)
- Pandemis Canadiana*, Kearf.—Aweme, VIII, 2 to 13; Cartwright, VIII, 5 to 14; West Manitoba.
- Tortrix Alleniana*, Fern.—Cartwright, VI, 28, to VIII, 4; Aweme, VII, 9 to 23; Rounthwaite, July.
- Tortrix lata*, Rob.—Aweme, VII, 15, to VIII, 15; Winnipeg; Rounthwaite, June. Since writing the note, which appeared on page 93, *ante*, on *T. pallorana*, Rob., I have had the opportunity of examining specimens of both these species, as identified by Prof. Fernald, and while I am not convinced that there is more than one species, would, for the present, place those from Aweme, as well as those collected by Mr. Willing, under *lata*. The coloration of both are of much the same shades, and individual variation connect the two series, and the only good difference is that the fore wings of *lata* are broader in proportion to their length than *pallorana*; the termen of the latter is more oblique.
- Tortrix albicomana*, Clem.—Rounthwaite, July, the intermediate yellow form.
- Tortrix quercifoliata*, Fitch.—Aweme, VII, 9 to 26. (New York to Texas.)
- Tortrix peritana*, Clem.—Aweme, VII, 21 to 28. (Atlantic States.)
- Tortrix conflictana*, Walk.—Aweme, VI, 18, Cartwright. (No. Atlantic States.)
- Tortrix horariana*, Wlsm.—Winnipeg. Type from Oregon, and not since recorded.
- Eulia quadrifasciana*, Fern.—Cartwright. (No. Atlantic States.)
- Eulia triferana*, Walk. Aweme, VI, 16; Beulah. (Atlantic States.)
- Phalonia vitellinana*, Zell.—Rounthwaite, July; Aweme, VI, 14 to 25; Cartwright. (Maine to Mass.)
- Phalonia angustana*, Clem. (*promptana*, Rob.)—Beulah, VIII, 15. (Penna. and Texas.)
- Phalonia angulatana*, Rob.—Rounthwaite, June; Aweme, VII, 29; Winnipeg, VI, 18. (Penna. and Texas.)
- Phalonia Smeathmanniana*, Fab.—Rounthwaite, June. Name subject to correction. (Europe, Maine and California.)
- Phalonia bunteana*, Rob.—Rounthwaite, July. (Atlantic States.)
- Phalonia anotherana*, Riley.—Rounthwaite, Aug.; Aweme, VI, 8, VIII, 3, and X, 13. (Atlantic States.)
- Hysterosia inopiana*, Haw.—Rounthwaite, June and July; Aweme, VII, 2; Beulah, VIII, 15; Cartwright. (Europe and Northern United States.)
- (To be continued.)

NEW SPECIES OF NOCTUIDÆ FOR 1905.—No. 2.

BY JOHN B. SMITH, SC. D., NEW BRUNSWICK, N. J.

(Continued from page 204).

Mamestra ascula, n. sp.—Ground colour very pale ashen gray, with a somewhat luteous tinge more or less obvious in most specimens; best marked in the male, most frequently wanting in the female. The ordinary lines are all broken and obscured by the shading, yet all distinctly traceable, geminate, one part of the line blackish, the other smoky and always partly incomplete. Basal line usually marked by a geminate spot on costa. There is a short black basal streak, best marked and a little curved in the female, and above it the basal space tends to be a little paler. T. a. line well removed from base, with a rather even outcurve, just a little drawn in on the veins. T. p. line outcurved over the cell, very obscurely marked in that part of its course, best marked on the incurve in the submedian interspace, where the included space is paler and the defining lines are well marked. A pale shading extends from that point to the hind angle, and another from the end of the cell to the apex; the latter is almost always present; the former is sometimes poorly marked. S. t. line irregular pale, sometimes defined by preceding black marks, sometimes only by the darker terminal space; always with a blackish shade above the hind angle, usually emphasized by white scales at this point. There is a series of blackish terminal lunules, a pale line at the base of the fringes, a blackish interline and an alternation of light and dark gray at the edge of the wing. The orbicular is long, narrow, very oblique, usually well defined, with blackish outer border and a white annulus. The reniform is of good size, rather narrow, oblong, with the angles rounded, though sometimes more kidney-shaped, usually well defined, though the defining lines are narrow and not contrasting; it may be concolorous, dark filled or of the palest gray in the wing, and in the male often has a slight ochereous tinge. Claviform usually small, inconspicuous, pointed, defined by blackish scales, sometimes extending across the median space, but never prominent. Secondaries in the male white, the veins sometimes marked with smoky near the margin; in the female a little smoky throughout, becoming dusky outwardly. Beneath, more or less powdery, primaries with disc darker; sometimes immaculate, sometimes with a well-defined blackish outer line, more rarely with a discal spot on all wings.

Expands: 1-1.20 inches = 25-30 mm. *Habitat*: Stockton, Utah, in September; Mr. Thomas Spalding.

July, 1905.

There are about 200 specimens before me, nearly evenly divided as to sex, and most of them in very good condition. The males are as a whole decidedly paler in colour than the females, and the tendency to the yellowish shading is best marked. The relationship is to *vicina*, which is darker, more bluish gray, has the claviform prominently marked and the ordinary spots of different form. There are other differences, but these will suffice to distinguish the new form.

Hadena erica, n. sp.—Ground colour bluish ash gray, marked with darker gray and blackish. Head with a black frontal line; collar with a narrow blackish line; patagia with a blackish submargin, disc powdered with blackish. Primaries with the lower half of basal space, the apical region and the submedian interspace between t. p. and s. t. lines much paler gray and with an ochreous tinge, giving the wings the appearance of having three pale blotches; this feature more obvious in the female. Basal line geminate, often lost, extending to a short black somewhat curved basal mark. T. a line geminate, inner portion vague, gray, outer blackish; the line as a whole a little outcurved and somewhat drawn in on the veins. T. p. line geminate on the costa, the outer portion lost before it is curved over the cell, the incurve deep. The s. t. line is pale, marked just before the apex, well drawn in and obscured by the apical pale area, and then with a very even and well marked bisinuation to the inner margin. There is a series of black terminal lunules and a yellow line at the base of the fringes which are cut with blackish. The orbicular is ovate, usually well defined, edged with black scales, with a whitish annulus, concolorous or paler gray. Reniform oblong, a little oblique, sometimes constricted, occasionally nearly kidney-shaped, inwardly marked by a whitish, outwardly by a black line, top and bottom not well defined. The claviform is black lined, large, broad, usually extending across the median space, concolorous. Secondaries whitish in the male, smoky in the female, veins blackish marked, a more or less defined extra-median line and a discal lunule. Beneath gray, powderings of primaries in the female nearly black, secondaries with an outer line and discal spot.

Expands: 1.12-1.32 inches = 28-32 mm. *Habitat*: Stockton, Utah, June and July.

Nine males and eleven females, most of them in good condition, from Mr. Tom Spalding. There is little variation, except what is due to the differences in contrast. The species is allied to *characta*, Grt., but differs obviously when a series is at hand.

Spragueia fumata, n. sp.—The entire insect is deep smoky brown, immaculate. Head, thorax and primaries covered by smooth glistening scales, giving the appearance of being covered with bronze or metallic green atoms. Secondaries with a slightly more reddish tinge, lustrous, but without the metallic reflections. Beneath, like the secondaries above.

Expands: .64–.74 inches = 16–18 mm. *Habitat*: Verdi, Nevada, June 1–10; A. H. Vachell.

Twelve examples are before me, almost evenly divided as to sex. Nine of these I owe to Mr. Kearfott, and three are from the collection of Mr. H. D. Merrick.

Yriasis irentis, n. sp.—Ground colour a reddish gray, more or less suffused by smoky gray and brown. The markings are fairly well defined, blackish, not prominent, the only contrasts being where the reddish ground is free from smoky powderings just beyond the reniform. Thoracic vestiture gray, mixed with pink scales, which form a crest on the collar. Primaries with all the lines and spots present, but varying much in distinctness, sometimes one or the other being lost or broken. Basal line of the reddish ground, defined by slightly darker edgings. T. a. line geminate, broken, nearly upright, outer portion blackish and most persistent; inner smoky and frequently lost. T. p. line single, lunulate, blackish, more or less broken, followed by a paler shading, with a long outcurve from costa over cell, and a small incurve toward inner margin. The median shade is somewhat diffuse, at or within the middle of the wing, nearly upright. The s. t. line is narrow, whitish, irregularly bent and curved, broken and tending to become lost toward the hind angle. There is a series of black terminal lunules, followed by a flesh-coloured line at the base of the long fringes, which are cut with reddish opposite the interspaces. The orbicular is a black dot in the cell touching the t. a. line, and is sometimes wanting. The reniform is black, not defined at the edges, variable in size and shape, but usually distinct, at just about the middle of the wing. Secondaries smoky gray, with a more or less obvious tendency to continue the transverse lines of the primaries; always best marked toward the inner margin. Beneath yellowish gray, with three lunulate transverse darker lines on each wing; secondaries also with a discal dot.

Expanse: .70–.75 inch = 17.5–18.5 mm. *Habitat*: Cochise County, Arizona, in July.

Three males and one female, all papered specimens, from Mr. George Franck. No two are alike, and the variation is due chiefly to the amount

of gray suffusion, which obscures or leaves the maculation in relief. The species is most nearly allied to *Y. albiciliatus* in general type of maculation, but is much nearer the typical forms in colour. In the tendency to relieve the reniform, it resembles *Homopyralis*.

Homopyralis cinctus, n. sp.—Ground colour a pale reddish luteous, on which the markings are shown in smoky or black. Head of the ground colour mottled with bronze brown scales. Palpi brown, banded with the reddish ground. Thorax of the reddish ground with a band of smoky, lustrous brown scales across the top of collar and another at the base. Abdomen concolorous. Primaries reddish luteous at extreme base; then brown to the t. a. line. T. a. line rigidly oblique inwardly, from costa beyond inner fourth to the inner margin at the inner fourth; geminate, the inner margin formed by the brown shade, the outer by a narrow brown line parallel to it, the included space of the ground. T. p. line geminate, a little sinuate, nearly parallel with the outer margin, the outer border formed by the brown space which extends to the outer margin, the inner by a narrow brown line parallel to it. The median space is thus paler than and contrasting with that on each side, a little darkened in the middle by a geminate dusky median shade. The brown space beyond the t. p. line is deepest at the line and on the costa, and lightens a little outwardly, being also interrupted by the irregularly sinuate, diffuse, pale s. t. line. There is a lunulate brown terminal line. Orbicular wanting in the specimen. Reniform black, moderate in size, oblong, a little oblique. Secondaries a little lighter than the primaries, the median shades, t. p. line and outer dark shading of primaries continued across the wing; a blackish discal spot partly obscured by one of the transverse lines; a narrow, lunulate brown terminal line. Beneath, yellowish, with black discal spot and vague transverse shades on all wings.

Expands: .68 inches = 17 mm. *Habitat*: Bill Williams Fort, Arizona, in August.

One female specimen in good condition from Prof. F. H. Snow. Readily recognizable by the broad reddish luteous median space between the dark brown base and outer part of wing.

Epizeuxis Merricki, n. sp.—Ground colour a glistening sooty black, tending to smoky when a little worn. Head and thorax concolorous, immaculate. Primaries with the transverse maculation obvious in most specimens, becoming clearer as the specimen is rubbed. T. a. line single blackish, diffuse, almost upright, and may be tilted a little to either side,

so as to be either inwardly or outwardly oblique. A broader, diffuse dark median shade, which is usually just at or a little within the middle of both costal and inner margins, and therefore inwardly oblique. T. p. line incepted by a whitish outcurved mark on the costa, then obscurely traceable across the wing as a crenulated dusky line, more or less emphasized by outward, pale defining scales. S. t. line irregular, whitish, tending to become lost. The reniform is vaguely indicated by a dusky blotch in some examples. Secondaries dull grayish white, with a smoky tinge which forms a broad sub-basal and a yet broader extra median dark band, the inner margins of each diffuse. Between these bands is a narrower, better defined blackish line. There is also a broken, dark terminal line. Beneath, both wings whitish, powdered with blackish scales, with irregular and variable transverse dark bandings and shades; the primaries with a discal spot.

Expands: .75-.82 inches = 19-21 mm. *Habitat*: New Brighton, Penna., July 20-Aug. 2 (H. D. Merrick); Chicago, Ills., July 12 (A. Kwiat).

Eight examples, six of them males, are before me. All were received from Mr. Merrick, and all save one are of his collecting. Most of the examples are good, and far above the average for species in this group.

In size and general appearance this resembles *rotundalis*, and I have little doubt I have so determined it from single examples; but I had none like it in my own material. The occurrence of a sufficient number to make comparisons shows a species tending to the *œmula* type of maculation with a remarkably even basal and median transverse shade.

APHODIUS ERRATICUS, LINN., at Halifax, N. S.—In the Canadian Entomologist for last year (Vol. 36, p. 164) Mr. Charles Stevenson mentions the fact of *Aphodius erraticus*, Linn., having been taken by his son on Montreal Island, and states that he can find no previous record of its being taken in Canada.

When I was in Halifax in 1897, I took a number of specimens of this insect, and the list of Coleoptera taken in Halifax that year is given in the Canadian Entomologist, Vol. 31, p. 321, where the above mentioned name will be found.

JOHN D. EVANS, Trenton.

[Mr. Evans has very kindly presented some specimens of this beetle to the Society's collection, and also a number of other species of Coleoptera from the Northwest and British Columbia, which are very acceptable indeed.]

THE LARVA OF *EUPITHECIA INTERRUPTOFASCIATA*,
PACKARD.BY JAMES FLETCHER AND ARTHUR GIBSON, CENTRAL EXPERIMENTAL
FARM, OTTAWA.

On May 19, 1904, Mr. W. Metcalfe found some green Geometrid larvæ, at Hull, Que., feeding on the common Juniper (*Juniperus communis*, L.). These were handed to the writers, who succeeded in bringing them to maturity. Three of the bred moths were sent to the Rev. G. W. Taylor, of Wellington, B. C., for identification. Writing under date of Nov. 26, Mr. Taylor says:

"I return two of the three bred specimens of *Eupithecia* sent me for study. They are undoubtedly *E. interruptofasciata*, Packard, which is not the same as *E. miserulata*, Grote. I have specimens of the latter from Pennsylvania which accord exactly with Grote's description, and the differences between these and yours are evident at once.

"*E. miserulata* has not a black band on second segment of abdomen. It has a small linear discal dot on fore wings. The outer margin of forewings is very straight. It flies in April and May.

"*E. interruptofasciata* has a conspicuous black band on second segment of abdomen. It has a large round discal spot on fore wings. The outer margin of fore wings is rounded and full. It flies in August and September.

"The first two points in each case are taken from the original descriptions, the two others from my own observations of my specimens. All the eastern *Eupithecias* (of which there may be 9 or 10 kinds), are lumped in most cases under the one name *miserulata*. It is the only species I have ever had offered to me in exchange."

In Packard's *Insects Injurious to Forest and Shade Trees* (5th Report U. S. Entomological Commission), there are no fewer than five descriptions of the larva of *E. miserulata*. These descriptions vary noticeably, and it certainly looks as if at least two distinctly different larvæ have been described under this name.

The following is a description of the larvæ found at Hull, Que.:—

Length, 16 mm., dark green, almost the same colour as the older leaves of the food-plant. Head paler than the body, and much smaller than segment 2. Body cylindrical, but appearing as if flattened dorsally. Dorsal vessel darker than body; subdorsal stripe whitish, rather indistinct; stigmatal band whitish, margined above with yellow, particularly at centre

July, 1905.

of each segment. Tubercles inconspicuous, each bearing a single short black hair. Venter slightly pruinose; feet concolorous with body.

On the 24th May two of the larvæ pupated in among the leaves of the food plant, the pupæ being enclosed within a slender covering of silk.

Pupa—8 mm. long, pale brown, the abdomen pitted and darker than the wing covers and thorax. Cremaster consisting of 10 or 12 slender, hooked spines, upon a thickened plate which covers the greater part of the last segment.

The moths emerged on the 7th Sept., 1904.

From the above description it will be seen that our larvæ resembled, rather closely, those found feeding on Juniper, at Salem, Mass., and referred to under the name *E. miserulata*, on page 910 of Packard's Insects Injurious to Forest and Shade Trees. On 21st May, 1905, 8 more larvæ were found in the same place. Four of these differed from the above description in having no subdorsal stripe.

NOTE ON COLLECTING HIBERNATING SPECIMENS.

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

Acting on the information given me by a woodchopper who had seen hundreds of green flies under the bark of a tree he had felled a few days previously, I made a further investigation, and upon reaching the locality found several dead Lace-wing flies crushed under the bark of a Tamarack tree he had been sawing up. Further search under the bark of a tall dead Tamarack (*Larix occidentalis*) which had just been felled, resulted in a rather unique catch on removing the bark, which peeled off easily from the butt end, hundreds of lively specimens of the minute Tineid, *Lyonetia speculella*, Clem., were found. Proceeding with the stripping towards the top, and at from 20 to 50 ft. from the butt, numerous specimens of the Tortricids, *Proteopteryx Columbia* (Kearfott), including both of the described varieties *Albidorsana* and *Mediostrania*, were seen. About 50 ft. up were dozens of a white barred *Elachistid* (*Mompha*, sp.). Also one specimen of *Orneodes hexadactyla*, L. The dates which I have previously recorded for this species were the first week in May and the end of July. Dr. Dyar mentions a specimen from me April 24th, and one he bred here July 13th. There are, therefore, apparently, two broods, the moths of the latter of which hibernate, and appear again in the spring, and a single specimen of *Depressaria Klamathiana* (Walshingham). A few Gelechiidæ were found in the next 30 feet, and at this point (corresponding in the case of both of the trees

examined), at a height of about 80 to 100 ft. from the ground, were discovered several dozens of a Lace-wing fly, *Chrysopa*, sp.

The occurrence of all of these insects in so secure a resting-place may be accounted for from the fact that the sapwood had been eaten out by Borers. The woodpeckers in their search for food had punctured numerous holes in the outer bark, leaving an easy entrance for these small flies and moths to the dry chamber formed between the bark and the shrunken stem of the tree.

But the curious part of the whole circumstance was the relative positions of the species. Few specimens of *Lyonetia* were seen above 15 feet. The Gelechiidae and Tortricids were all closely associated at greater heights, and all the *Chrysopas* were in a comparatively small area and near the top of the tree, not a single specimen being discovered in either tree below the limit of 80 feet.

The date of the above trip was March 2nd, 1905; there was about two feet of snow on the ground, but a thaw having set in a few days previously no doubt accounted for the activity of many of the specimens taken.

The woodchopper tells me that nearly a mile away from the trees mentioned above, he found another tree, a dry Tamarack, with the same kinds of insects beneath the bark. He brought me several specimens in a cyanide bottle which I had given him. Again the Lace-wing flies, and the other moths associated with them, were at the top of the tree.

HYDROMETRA AUSTRALIS, SAY.

BY J. R. DE LA TORRE BUENO, NEW YORK.

Since my "Notes on *Hydrometra Martini*, Kirk.," in the CANADIAN ENTOMOLOGIST for January of this year, pages 12 to 15, I have had the opportunity of examining another specimen of Say's "var. *australis*," and study of it confirms the conclusions I then drew. It is unquestionably a good species and not merely a variety, and it affords me real pleasure to recognize a true *Hydrometra* of which Say is the author. The specimen to which I here refer is also a male and was taken by Mrs. Annie Trumbull Slosson, at Jacksonville, Florida. Since Say gives his locality as "Louisiana" and my specimen came from Thomasville, Georgia, the bug would seem to have quite an extended range along the Gulf of Mexico and on the warmer shores of the Atlantic Ocean. Lack of material, especially of females, makes it unwise to draw up an extended description at present, but it should be done in order to establish the species beyond peradventure.

SOME BEES COLLECTED BY THE REV. G. BIRKMANN AT
FEDOR, TEXAS.

BY T. D. A. COCKERELL, BOULDER, COLO.

Emphoropsis Birkmanni, n. sp.

♀.—Length about 15 mm.; similar in size, build and pubescence to *E. floridana* (Sm.), except that the hair of thorax above is entirely bright orange-fulvous; hair of occiput and vertex (except some black hairs at sides, but including the conspicuous interocellar tuft) is pale orange-fulvous; and the wings are not so dark. From *E. rugosissima*, Ckll., it differs by the colour of the pubescence of the thorax, and the long hair at sides of first abdominal segment black (white in *rugosissima*). The lateral hind margins of the first segment have a white fringe, which is the more conspicuous by contrast with the black in front of it. The hair of the legs, abdominal venter, pleura (except the upper part, as in allied forms), cheeks and clypeus is black.

Hab.—Fedor, Texas, 2 ♀'s (*Birkmann*). March 29 and 30. The *floridana* group includes several closely allied forms, separable in the ♀ thus:

- | | |
|--|----------------------------------|
| Hair of cheeks black |1. |
| Hair of cheeks white; of thorax above bright orange-fulvous |3. |
| 1. Hair of occiput black (Fla., Ga.) | <i>floridana</i> (Sm.). |
| Hair of occiput whitish or fulvous |2. |
| 2. Hair of thorax above yellowish-white (Nevada) | <i>rugosissima</i> , Ckll. |
| Hair of thorax above bright orange-fulvous (Texas) | <i>Birkmanni</i> , Ckll. |
| 3. Hair of face and vertex with black intermixed (Wash.) | <i>pascoensis</i> , Ckll. |
| Hair of face and vertex without black intermixed (Colo., New Mexico) | n. sp., Viereck, ined. |

E. floridana (Sm.) also occurs at Fedor, the ♀ taken March 25, the ♂ April 9. The insect, however, is not typical, but may rank as a variety, thus:

Emphoropsis floridana, var. *Fedorensis*, n. var.

♂.—Hair of occiput black, of thoracic dorsum and first abdominal segment white, with practically no yellow tint; spurs yellowish-white (black, with reddish ends, in *floridana*); apical plate of abdomen narrower at end.

♀.—Hair of first abdominal segment with much black (all light in *floridana*); pygidial plate broader at end, truncate, with five transverse file-like lineolæ. Although the hair of the thorax above (yellowish-white

in colour) in this and true *floridana* is described as being without black, in both there are a *very few* black hairs, which can be seen if looked for. This is not true, however, of the males.

The known males of *Emphoropsis* similar to *floridana* may be separated thus :

- Hair of thorax above with black conspicuously intermixed 1.
- Hair of thorax above without black intermixed 2.
- 1. Hair of abdomen beneath all black ; scape entirely black
(Calif.) *interspersa*, Ckll.
Hair of abdomen beneath largely pallid, at least in certain lights; scape white in front (Calif.) *semifulva*, Ckll.
- 2. Scape white or yellowish in front (Colo.) *Morrisoni* (Cresson).
Scape all black 3.
- 3. Hair of occiput black ; spurs yellowish-white *floridana Fedorensis*, Ckll.
Hair of occiput light ; spurs dark *floridana* (Sm.).

Xenoglossa strenua (Cresson).

The Fedor insect is the typical red-legged form, not the dark-legged var. *Kansensis*, Ckll., which Snow obtains in Kansas.

Melissodes melanosoma, n. sp.

♂.—Length just over 12 mm. ; black, pubescence entirely black, except on the face, labrum, part of occiput, outer side of all the tarsi and of hind and apical half of middle tibiae, where it is white ; wings dark fuliginous ; clypeus light lemon yellow, with the usual black spot on each side ; labrum dull whitish, the lateral margins black ; flagellum ferruginous beneath, except apical half of last joint. Agrees with *M. bimaculata*, Lep., except in having the spurs piceous, and the hair of thorax and abdomen wholly black, above and below ; it is also a little larger than *bimaculata*. It may prove to be only subspecifically distinct, as *bimaculata* itself is quite variable.

Hab.—Fedor, Texas, May 26, 1904 (*Birkmann*). The males of the black *melissodes* of the *bimaculata* group may be separated thus :

- Clypeus entirely black ; abdomen and legs without white hair (Mexico) *pernigra*, Ckll.
- Clypeus black with a semicircular yellow spot or patch ; abdomen with some white pubescence (Mexico) . . . *atrata*, Smith.
- Clypeus yellow, with a black dot on each side ; hind legs with much white hair I.

1. Abdomen and thorax with the hair entirely black
(Texas).....: *melanosoma*, Ckll.
Abdomen with conspicuous white hair at sides, at least.....2.
2. Hair of pleura and mesothorax largely dull white (S. Illinois,
Robertson).....*bimaculata*, Lep., var. a.
Hair of pleura and mesothorax black3.
3. Mandibles with a large yellow spot (Baldwin, Kansas, July,
Bridwell).....*bimaculata*, Lep., var. b.
Mandibles with at most a very minute yellow dot (Ames, Iowa,
E. D. Ball)*bimaculata*, Lep., var. c.
A specimen of *bimaculata* from New York State has the hair of
pleura and mesothorax all black, so this is not especially a character of
western examples. The most western locality I know for *M. bimaculata*
is Wellsville, Kansas, where both sexes were taken by Mr. S. A. Johnson.
Anthedon compta (Cresson).

Both sexes of this magnificent species were taken at Fedor, June 19,
1899. It is new to the fauna of Texas.

Anthophora abrupta, Say.

Fedor; the female, April 8, 1904; males, April 27 and 29. Unless
the venation is examined, this will be likely to be confused with
Emphoropsis floridana Fedorensis.

BOOK NOTICES.

A CATALOGUE OF THE ERYCINIDÆ OF THE WORLD.—By Levi W. Mengel, Pro-
fessor of Natural History, Boys' High School, Reading, Pa. I vol.,
pp. 161. (Price \$2.00.)

This very full and comprehensive work will be of great value to all
students of Butterflies who do not confine their attention to the species
inhabiting their own country. It is similar in arrangement and style to
Dr. Skinner's well-known Catalogue of North American Rhopalocera, giv-
ing full bibliographical references and habitat for each species. Its
extent may be realized by the following comparison: In the genus
Libythea Dr. Skinner gives 2 species and Prof. Mengel 21; in the sub-
family Lemoniinae the former has two genera, including 11 species, the
latter 86 genera and an enormous number of species. The book is very
clearly printed and is made complete by a full index of all the species
and synonyms contained in it. It may be obtained from the author.

ENTOMOLOGEN-ADRESSBUCH.—By W. Junk, Rathenower Strasse 22, Berlin, N. W., Germany. (Price 5 marks.)

This directory of Entomologists throughout the world contains about 9,000 names and addresses, with in most cases the special orders or families of insects to which the individual is devoted. The list is arranged under countries, but there is added an alphabetical index which increases its convenience very much. The volume includes also a catalogue of over one hundred pages of new and second-hand books for sale by the publisher.

GENERA INSECTORUM.—Published by P. Wytman, Brussels, Belgium.

Fascicule 24—Heteroptera: family Pentatomidæ, sub-fam. Scutellerinæ, by H. Schouteden. This part consists of 98 pages, with five coloured plates on which are depicted about 80 species of Bugs, and several drawings in the text. It is written in French.

Fascicule 25—Isoptera: family Termitidæ, by Jules Desneux (also in French), contains 52 pages and two coloured plates showing 12 species of "White-ants," with many details of structure.

Fascicule 26—Diptera: family Culicidæ, by Fred V. Theobald (in English), contains 50 pages and two coloured plates showing 24 species of Mosquitoes.

These parts are all on the same general plan, giving a full description of the family treated of, keys to sub-families and genera, the characters of each genus and a list of species with geographical distribution and bibliography. They are of very great value to those studying the particular group of insects treated of, but there is a difficulty in procuring them, as subscriptions are apparently taken only for the whole work, and the parts are not sold separately. As the entire cost will probably approach \$400, very few students of Entomology can afford such an outlay, while many would be delighted to purchase for a few dollars the part in which they are specially interested.

REPORTS OF THE EXPERIMENTAL FARMS OF THE DOMINION FOR 1904.—This goodly volume of over 500 pages contains a vast fund of information on every variety of subject that can interest the farmer, fruit-grower or gardener. In the portion furnished by Dr. Fletcher (pages 205-256), there are descriptions of a large number of insects affecting cereals and field crops, roots and vegetables, fruit crops, and forest and shade trees; special attention is drawn to the Pea-weevil and Cut-worms among many other insect foes which have to be contended with. He also furnishes in the Botanical portion, an account of the injury to grain crops by Rust last year, which was most exceptional in extent, owing, evidently, to peculiar atmospheric conditions.

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