

The Canadian Entomologist.

VOL. XXXVII.

LONDON, MAY, 1905.

No. 5

PRACTICAL AND POPULAR ENTOMOLOGY.—No. 5.

CANADIAN THREE-COLOUR PROCESS ILLUSTRATIONS.

BY JAMES FLETCHER, OTTAWA.

We are indebted to the Toronto Engraving Company, Limited, for the beautiful plate given in this month's issue. The invention of the trichromatic photographic process of illustration is undoubtedly one of the most important stimuli to scientific work of recent years. Especially is this the case in the study of insects, where it is frequently necessary to depict accurately very slight differences, both in form and colour, which could be described only with difficulty, or at great length. The three-colour process makes it now possible to reproduce, with great exactness, any coloured object that may be desired, and at a moderate cost. As excellent examples of this kind of work in illustrating insects, we may refer to the many beautiful figures which have appeared in the pages of our esteemed contemporary "Entomological News," as well as those which have also adorned some of our own issues.

Up to the present time the best class of this work has all been done in the United States, but we are now able to present a plate done entirely in Canada by the Toronto Engraving Company, Limited, which, to the writer, seems to be equal to the best imported work. Anyone wishing to get full particulars as to cost, etc., should correspond directly with the above firm.

The insects figured on the accompanying plate were chosen with the special purpose of showing a wide range of colouring. The species are so well reproduced that there will be no trouble in recognizing all of them.

Figures 1 and 1a represent the Large Ermine, *Estigmene acrea*, Drury, female and male. This beautiful moth, which is common in all parts of Canada, is the perfect state of the so-called Salt-marsh Caterpillar, a name which was given to it many years ago by Dr. Harris, and of which an interesting account is given in his classic work on the Insects Injurious to Vegetation. The full-grown caterpillar is one of the common "woolly bears" and when full-grown is over an inch and a half in length. It is

extremely active and is clothed with long hairs, which are mostly of a blackish or reddish tint on the back, but of a lighter colour on the sides of the body. The colour of the skin is gray, marked on the sides with black spots and yellowish streaks. The female moth has all the wings of a beautiful silky white, dotted with black. The male shown at 1a is easily distinguished by its orange underwings. As an instance of the large amount of good work which is still to be done in entomology, it may be pointed out that, as far as the writer can learn, no complete life-history of this common and beautiful moth has ever been published.

Figure 2. The Two-lobed Plusia, *Autographa biloba*, Steph. The Plusias form a favourite group with all collectors of moths. They are active moths, for the most part beautifully marked with bold silver or gold marks on the forewings, contrasting with a brown or bronzed background. The caterpillars of many of the species have not yet been described, but they are interesting from the fact that they are semi-loopers, having only two pairs of prolegs on the abdominal segments, instead of four pairs as in most noctuid caterpillars. The food plants of most of the species in the group to which the Two-lobed Plusia belongs, are various low herbaceous plants. The caterpillars are of a delicate green colour, closely resembling the hue of the plant upon which they feed.

Figure 3. The Large American Tiger Moth, *Arctia caia*, L., a. *Americana*, Harr. There are few more striking insects than the beautiful large tiger moth which is shown herewith. In some specimens the large black spots shaded with blue on the underwings are very much larger and more numerous than in our figure; likewise, in some specimens the white markings on the primaries may be more conspicuous or almost obliterated. The caterpillar, which has been described fully by Mr. Arthur Gibson in the "Canadian Entomologist" for November, 1900, is two inches in length, of a deep black above, rust-red on the sides, and covered with long, sweeping black and silvery hairs. The eggs are laid in summer, the caterpillars make about half their growth before winter sets in and become full-grown in June, the moths appearing a month later.

Figure 4, the Cerise Underwing, *Catocala concumbens*, Wlk. The Underwings are a very large and favourite group with collectors. The present species is, perhaps, one of the most attractive and is a common moth in Eastern Canada. The caterpillar feeds on willow.

Figure 5, the Nepigon Forester, *Parasemia plantaginis*, L., b. *Scudderi*, Pack. The form here shown is the extremely constant and invariable one which may be taken in hundreds at Nepigon, north of Lake Superior. This was described by Henry Edwards as *Nemeophila Selwynii*; but, as Mr. H. H. Lyman has pointed out, it is most probably the same insect as was described by Packard under the name of *N. Scudderi*. The stem-species *P. plantaginis* is remarkable for its extreme variability, as may be seen in a large series of specimens taken at any place in the foothills of the Rocky Mountains; but the Nepigon form is remarkably constant in all its markings; and, although an occasional specimen taken in the West may resemble the Nepigon form very much, there is always one small but seemingly good character by which the specimens may be separated, viz.: a short orange stripe at the base and extending about one-fifth of the length up the edge of the costa. This has always been entirely wanting on all specimens which I have taken at Nepigon (some hundreds) or have bred from the egg.

Figure 6 and 6a, the "White Pine Butterfly" (of British Columbia), *Neophasia menapia*, Felder. Periodically the Douglas Spruces in the coast regions of British Columbia, and the Bull Pines, *Pinus ponderosa*, of the interior of that province, are severely injured by the white-striped, dark green caterpillars of the beautiful Pierid here illustrated (female, upper and lower side). The male butterfly is much whiter and does not show the rich markings on the veins. The eggs are most beautiful objects, resembling minute emerald green Florence flasks, vertically lined with delicate lines and with a beaded rim of porcelain-white knobs. The eggs are laid in rows of from five to fifteen along the leaves, at an angle pointing to the tip of the leaf, and cemented together. Eggs laid in the Okanagan Valley of British Columbia at the end of July remained as eggs all through the winter and hatched from the 5th to the 12th April the following spring at Ottawa and in West Virginia. In some seasons, as last year, this butterfly is enormously abundant in British Columbia during August, and the dead insects may be seen in myriads, floating on the sea around Vancouver Island. The females are always remarkably less abundant than the males.

Figure 7 represents the common noctuid, *Noctua bicarnea*, Gn. This figure is not so successful as the others on the plate, the markings being less distinct than might have been expected from the specimen.

A NEW CARABUS AND CYCHRUS, WITH MISCELLANEOUS NOTES ON COLEOPTERA.

BY THOS. L. CASEY, ST. LOUIS, MO.

Among a large series of Coleoptera collected by Mr. C. H. T. Townsend in the northwestern part of Mexico and forwarded to me some years ago, I note an interesting new *Carabus*, which may be described as follows:—

Carabus Townsendi, n. sp.—Somewhat similar to *Forreri*, Bates—Ann. & Mag., N. Hist., ser. 5, IX., p. 320—from Durango, but narrower in form, the elytra having similarly close-set unimpressed series of very minute punctures, but having each only two series of larger, widely-spaced, impressed foveæ, the inner of the three series of *Forreri* being wholly obsolete, the middle series only present in basal half and the outer extending only to apical fourth, the lateral margin more narrowly reflexed and with bluish reflection. Length, 21 mm.; width, 9 mm.

The single specimen in my cabinet was taken at Meadow Valley, six miles south of Colonia Garcia, Chihuahua, Mexico, in the Sierra Madre Mountains, at an elevation of 7,300 feet.

Cychnus pustulosus, n. sp.—Black, dull in lustre, with shining elytral tubercles; head coarsely punctato-rugose, with well-marked supra-orbital ridges, the front but feebly elevated at the middle; prothorax rather wider than long, the sides broadly rounded anteriorly, becoming oblique and nearly straight toward the base as in *Hemphilli*, the angles obtuse, the surface coarsely punctato-rugose and dull, the margins very finely reflexed; elytra oval, having each three series of large, widely-spaced, rounded and polished tubercles, increasing in size to the summit of the declivity and even more conspicuous than in *tuberculatus*, though less numerous, the intervening surfaces with single series of small tubercles, the interspaces also minutely and irregularly tuberculose or granulose, dull and lustreless. Length, 17 mm.; width, 8 mm. Washington State.

The single female before me differs from *tuberculatus*, not only in its oblique sides of the prothorax toward base, but in its smaller size, less robust form and stronger elytral tubercles. The prothorax of *Hemphilli*, *Rickseckeri* and *pustulosus* is oblique and nearly straight at the sides toward base, while in *tuberculatus* the sides are broadly sinuate posteriorly, the basal angles being right.

The European *Cryptophilus integer*, Heer., seems to be cosmopolitan in distribution, and, although unknown to me at the time of revising our

Cryptophagidæ (Journ. N. Y. Ent. Soc., VIII), I have since obtained single specimens from Vicksburg, Miss., Alexandria, La., and Del Rio, Texas.

In my revision of the American Colicnelliidæ (l. c., VII) I erected a new genus—*Neomysia*—for the species of our fauna usually called *Mysia*, and, although I am now inclined to think that there is really no generic difference between our species and the European, the name *Neomysia* will, nevertheless, have to be applied to both, as *Mysia* is a preoccupied name. In the genus *Zagloba* (l. c., p. 113), the two forms described under the names *laticollis* and *orbipennis* seem to be merely varietal in nature, although the material in my cabinet is too scanty to base any final judgment upon. As stated by Mr. Fall, my *Exochomus ovoideus* (p. 107) should be regarded as a synonym of *desertorum*; the locality label on the former specimens is undoubtedly erroneous; they may have been taken in Colorado, in which region much of Dr. Levette's material was collected. *Nephaspis brunnea* seems to be the female of *Gorhami* (p. 168), and the name should therefore disappear in synonymy. It is my desire, in the near future, to revise again our species of *Scymnus*, as the table published in the paper mentioned is far from satisfactory in many respects.

Liobauius spectans, Csy., described in the preceding volume of this journal, is closely allied to the Central American *Anthicus clavicornis*, Champ., differing principally in having the elytra punctate only in the transverse subbasal depression and not striato-punctate in basal third. *Impressipennis*, Laf., described from Texas, which also appears to be allied, differs in coloration and in its much more elongate elytra. No species closely allied to *Fronteralis* is alluded to by Mr. Champion in the "Biologia."

VANONUS, Csy.

Renewed observation upon the material in my collection seems to prove that those examples having the under surface of the hind femora densely papillose and the antennæ evenly and gradually enlarged distally, are males, while those without the femoral pad, but with a strong subapical lamelliform tooth on the under side of the hind femora—the antennæ having an abrupt pentamerous club—are females. It may be said, at least, that where the male spicule is visible at all, the femora are papillose, and, in the only case before me where the sex is evidently female, the femora are simply toothed. In my previous work (Col. Not., VI., p. 791,) I took it for granted, to some extent, that the remarkable

femoral tooth and abnormal antennal characters bespoke the male, and was therefore led to make a distinct genus for these females named *Tanilotes* (l. c., p. 798). Suppressing the genus *Tanilotes*, therefore, we may suggest the following arrangement for the rather numerous species of *Vanonus* :—

- Vestiture simple and uniform, short, rather stiff and not conspicuous 2
- Vestiture dual, consisting of larger, suberect and stiffer hairs, borne by the punctures, and very small, fine decumbent and denser hairs covering the interspaces; eyes generally very large, the body always small in size, less than 1.5 mm. in length; basal impressions of the pronotum large but shallow, always separated 9
2. Two subbasal impressions of the pronotum confluent transversely 3
- Two subbasal impressions separated 8
3. Subbasal impression of the pronotum feeble, especially at the middle; species much larger, nearly 2.5 mm. in length, rather sparsely punctured, brown in colour, the head darker. Wisconsin *calvescens*, Csy.
- Subbasal impression deep and conspicuous throughout its extent; species minute, scarcely ever exceeding 1.5 mm. in length 4
4. Prothorax as long as wide, or nearly so, the sides oblique and nearly straight anteriorly 5
- Prothorax transverse 6
5. Eyes moderately large, separated by scarcely more than twice their own width; occiput but slightly elevated, blackish-piceous in colour, the antennæ and legs red-brown; elytra feebly elevated internally near the scutellum. Pennsylvania (near Philadelphia) *piceus*, I.c.c.
- Eyes smaller, separated by much more than twice their own width, the front flatter and the occiput more elevated when viewed laterally, slightly smaller in size, black or blackish in colour; elytra more strongly and abruptly subtuberculate inwardly near the humeri. Ontario (Severn) *tuberculifer*, Ham.
6. Eyes large, separated by much less than twice their own width; antennæ thick, gradually incrassate; prothorax small, subparallel toward base, narrowed apically, dark piceous-brown throughout. New York, (Hudson Valley) *vigilans*, Csy.
- Eyes much smaller, separated by distinctly more than twice their own width; prothorax strongly, almost evenly rounded at the sides and but slightly more narrowed apically than basally 7
7. Pale brown, the head piceous, moderately stout and convex; head intermediate in width between the prothorax and base of the elytra,

finely punctured; antennæ about half as long as the body, rather slender, enlarging moderately toward tip; prothorax finely but strongly, closely punctured; elytra parallel, about two-thirds longer than wide, the punctures strong and rather sparse, the surface strongly shining, each broadly but rather abruptly swollen near the scutellum. Length, 1.4 mm.; width, 0.75 mm. New York, (near the city)

- fusciceps*, n. sp.
- Darker brown, the head blackish; integuments much duller in lustre, the punctures denser, those of the elytra smaller, but more close-set; antennæ almost similar; prothorax relatively larger, strongly rounded at the sides, slightly narrower than the head; elytra rather more elongate and less subtruncate at apex, the swellings near the scutellum feebler and more diffuse. Length, 1.5 mm.; width, 0.7 mm. Wisconsin (Bayfield). Mr. Wickham.....
8. Eyes small, moderately prominent, the tempora behind them larger than in any other species of the genus, and from more than one-half to two-thirds as long as the eyes; front broadly convex, closely punctate in the male, sparsely in the female; male antennæ about half as long as the body, the five outer joints very faintly larger, those of the female two-fifths as long as the body, with the five outer joints more distinctly enlarged; prothorax densely punctate, wider than long, only slightly narrower than the head, narrowed anteriorly; elytra parallel, obtusely rounded at tip, finely, strongly and closely punctured, more elongate in the male and about three-fourths longer than wide; size small as in *piceus*. Wisconsin (Bayfield). Mr. Wickham. [= *Tanilotes lacustris*, Csy.].....
- Eyes larger, almost attaining the base; size much larger, about 2 mm. in length, similarly blackish in coloration and only moderately shining, strongly and closely punctured; antennæ barely two fifths as long as the body, the five-jointed club very broad and conspicuous; elytra parallel, nearly twice as long as wide, obtuse at apex; femoral tooth of the female much larger than in *Wickhami*. Pennsylvania (near Philadelphia).....
9. Eyes separated by distinctly more than their own width; antennæ shorter, two-fifths as long as the body, gradually but strongly increase distally; elytral punctures coarser and less dense, the surface somewhat shining. Florida (Crescent City).....
- Eyes separated by not more than their own width and sometimes less; elytral punctures smaller, dense, the surface very dull; antennæ much longer, fully one-half as long as the body.....
10. Basal thoracic impressions distinct; form stouter, nearly as in *piceus*; antennæ thick, rather more than half as long as the body, only just
- congener*, n. sp.
- Wickhami*, Csy.
- densus*, Csy.
- Floridanus*, Csy.
- 10

visibly incrassate throughout their length, pale; body piceous-black, the legs slender, dark brown throughout. Michigan...*Huronicus*, Csy. Basal thoracic impressions very feeble; body smaller and slender; antennæ thinner but more obviously incrassate from base to apex, black, the antennæ and legs pale, the femora blackish. Florida (Indian River)*sagax*, Csy.

The types as described above are males throughout, having padded femora, except *densus*, of which the only known representative is a female. The key to the interpretation of sexual identity here assumed was fortunately given by the two specimens of *Wickhami* before me, and it is regrettable that a greater number of individuals are not known in other species, in order to verify or modify the conclusions arrived at from this pair. The sexual differences certainly appear to have developed a most unusual form, since femoral modifications of the kind noted in the assumed females of *Vanonus* almost invariably pertain to the male. The types of *congener* and *fusciceps*, following my original hypothesis, were the females of other species of the *piceus* group, but, upon the theory that all the individuals with padded femora are males, they could be considered in no other light than distinct species.

The generic name *Schizonotus* (Col. Not, IV., 1892, p. 708) is several times preoccupied, and I would therefore substitute *Schizomicrus*. The genus *Pseudolesteva*, Csy., (l. c., V., p. 398) is also preoccupied, and I would therefore substitute for it the name *Paralesteva*.

A copy of the "Index Zoologicus," of Waterhouse and Sharp, just received, forms a very useful addition to the library, although marred by a considerable percentage of error. Referring to my own genera, for example, I find the genus "Achromata," attributed to me, should be *Achromota*, and, in a similar way, the genus "Megafaronus" should be *Megarafonus*. "Olia" should be *Olla*, "Pontalomata" should be *Pontomalota* and "Uloporus" should be *Uloporus*. The genus "Eomedon," similarly assigned, was not described by me. *Eulitrus*, "Casey," should be *Eulitrus*, Sharp. I do not recollect having founded any such genera as "Sponidium" and "Typitium," which are attributed to me, and further verification is necessary. The genus *Tyloderma*, Say, seems to have been overlooked in all the lists that I have been able to consult; it is an important genus of Curculionidæ. The names *Delius*, *Isoglossa*, *Orus* and *Phalacropsis*, proposed by me, have been repeated by other authors, and, as these genera appear to be valid, the latter names will have to be changed. The name *Ditaphrus*, Csy., repeated later by Sharp, is, however, a synonym, and Sharp's name will therefore remain valid, unless it be considered better to have no two names alike, even though one of them may be a synonym, which in the writer's opinion is the preferable policy regarding genera, although unnecessary in the case of species.

NEW SPECIES OF COLEOPTERA FROM THE WESTERN UNITED STATES.

SECOND PAPER.

BY H. F. WICKHAM, IOWA CITY, IOWA.

A number of interesting undescribed species of Coleoptera have accumulated in my cabinet, principally as the result of my own trips to the western parts of the country. The description of several of these follow, care having been taken to avoid describing forms belonging to genera of great extent which have not been recently monographed :

CICINDELA, Linn.

C. Parowana, n. sp.—General form of *C. fulgida*, Say, but a trifle more elongate. Above bright, shining blue-green, beneath purple-blue. Head granulate above, interocular striæ fine and numerous, front very hairy, cheeks with a few white hairs, labial palpi of male pale at base, labrum longer and more advanced in the middle than in *fulgida*. Prothorax much as in *fulgida*, but more narrowed behind and less hairy. Elytra proportionately a little longer and more finely and clearly punctate than in *fulgida*, the surface very finely rugulose, the tips minutely serrulate. Markings of the type of *fulgida*, but the middle band is prolonged backward along the side margin, though not reaching the apical lunule, while the descending discal portion is more elongate, less curved, scarcely enlarged nor reflexed at tip. Vestiture of the under surface much as in *fulgida*. Length, 13 mm., .52 inch.

I collected a small series of this interesting beetle on the old sand beaches of Little Salt Lake, near Parowan, Utah, about the middle of August. They were running and flying at a distance of perhaps half a mile from the water's edge on bare spots among the scant grass and weeds which dot the waste bottoms. As I was engaged at the time in a search for *C. echo*,* I thought at first that I had secured a green race of that species which would lead into *C. pseudosenilis*, and not until after reaching home did I find that my captures were more nearly allied to *C. fulgida*. I succeeded also in finding the true *C. echo* in this same neighbourhood, though it was more abundant closer to the lake.

After a casual comparison with specimens in my cabinet, my first impression was that the above-described form should be classified as a local colour-variety of *C. fulgida*, but on further examination I have

*See The American Naturalist for September, 1904; also the Annual Report of the Entomological Society of Ontario for the same year.

decided to let it stand for the present as a species which should go between *fulgida* and *echo* (though more closely allied to the former), since the characters used in diagnosis seems absolutely constant in my series. The backward extension of the marginal portion of the median band, unaccompanied as it is by any tendency to forward expansion, is a striking character, though not in itself of any great taxonomic value.

SCYMNUS, Kug.

S. virginialis, n. sp.—Form broadly oval, convex, outline of thorax and elytra nearly continuous. Beneath testaceous, the femora more or less piceous, above black, anterior angles of the prothorax indefinitely paler, each elytron with a large oval spot (most of which is antemedian), and a triangular lateral mark, broadest on the base and gradually narrowing posteriorly, orange-red. Head extremely sparsely and minutely punctured. Prothorax sparsely and finely punctured, narrower at apex, broadest in front of the middle, sides arcuate anteriorly, more nearly straight behind, basal margin not regularly curved, but sub-sinuate laterally and truncate in front of the scutellum, the marginal line visible, but not well marked. Scutellum finely punctured. Elytra more deeply and coarsely punctured than the prothorax, the surface (when denuded of pubescence), shining. Prosternum with the elevated ridges subparallel. Mesosternum punctate and rugulose, metasternum more coarsely punctured at sides. Abdomen not closely nor coarsely punctured, the metacoxal arc covering only about half the width of the first abdominal segment and not attaining the outer anterior segmental angle. Length, 2.85 mm., .114 inch.

Found at Leeds, St. George and Chadburn's Ranch, all in the Virgin River basin, of southern Utah. I took a number of specimens of this fine large species, in July, and they show considerable variation in coloration. The pattern described above is that of the type, and seems to be the most characteristic; some individuals, however, have the reddish elytral spot confluent anteriorly with the latero-basal mark, so that only the sutural region and a large apical blotch remain black. The head, in one specimen, becomes reddish, and in this individual there is also a narrow transverse reddish stripe on the prothorax. The extent of the prothoracic pale margin is somewhat variable, and the abdomen is occasionally clouded along the middle. The pubescence, above and beneath, is whitish, not concealing the surface colour. By Dr. Horn's synopsis, this species belongs next to *cinctus*, Lec., and it seems certainly different from any of those described later by Major Casey.

GVASCUTUS, LeConte.

G. juniperinus, n. sp.—General form of *G. obliterated*, Lec. Colour metallic-purplish, shining, surface obscured by a greenish-yellow pollinose deposit, which becomes whitish on the sterna and venter, the entire body and legs clothed as well with a fine, sparse, short white pubescence. Head coarsely, unevenly and confluent punctured, epistoma broadly emarginate. Eyes much less oblique than in *G. planicosta* and *G. obliterated*, so that the face between them, viewed from in front, is about as broad at top as below. Antennæ short, not or scarcely attaining the posterior thoracic angles, the second joint proportionately shorter and thicker than in the female of *G. obliterated*. Pronotum about two-thirds as long as wide, convex, irregularly coarsely punctate, the punctation extensively confluent at the sides and anterior margin. A broad median space is simply irregularly punctate, the punctures well separated. Sides arcuate anteriorly, nearly straight and almost parallel in posterior three-fifths. Base emarginate at middle, sinuate each side; apex slightly rounding. Hind angles acute, scarcely perceptibly divergent, front angles obtuse. Elytra, across the humeri, slightly wider than the base of the prothorax, scarcely perceptibly narrowed to about three-fifths, thence rapidly to apex, which is emarginate or shortly spinose, side margin serrate near the tip, surface with small, irregular smooth spaces and rather finely punctured, the punctures somewhat regularly serially arranged near the suture, but confused near the sides and tip, where they become extensively (especially transversely) confluent, giving rise to a rugose structure. Prothorax beneath rather coarsely, deeply and confluent punctured, the prosternum between the coxæ smooth, highly polished, not sulcate, but with a longitudinal row of pitlike punctures. Meso- and metathoracic sidepieces coarsely and confluent punctate, sterna sulcate, smoother near the middle where the punctures become sparser, but deeper. Abdomen rather coarsely rugosely punctured at sides, middle alutaceous between the punctures, which are coarse, but generally well separated. Last ventral subtruncate and somewhat uneven at tip. Legs alutaceous and distinctly strongly punctured to the tips of the tibiæ. Femora and tibiæ simple, the anterior tibiæ very slightly arcuate, the middle and hind ones practically straight. First joint of hind tarsi as long as the second and third united, claws simple. Length, 11.75 to 13 mm. .47 to .52 inch.

Described from three specimens which I beat from Juniper, July 22, on Chadburn's Ranch, in the foothills of the Pine Valley Mountains, at an

altitude of about 4,500 feet. This locality is in Southern Utah, about twenty-two miles from St. George, on the road between that place and Modena. The species is abundantly different from *G. obliteratus* by its smaller size, different colour and sculpture, shape of the head and structure of the antennæ. From *G. planicosta* it differs not only by the above characters, but also in lacking raised elytral costæ. *G. cuneatus* is described as being larger (.75 inch. = 18 mm.), of different colour and with truncate epistoma. The food habit of this species is noteworthy, *G. obliteratus* being found on several species of desert shrubs, while *G. planicosta* frequents especially the bushes of *Larrea Mexicana*. Although *G. obliteratus* was rather abundant at St. George throughout July, I did not see it in the neighbourhood of the ranch at all.

HYDROCERA, Newman.

H. Knausii, n. sp.—Form moderately elongate, not notably convex. Testaceous; legs and antennæ yellowish, eyes, metasternum (excepting the side pieces), abdomen, scutellum and elytral bands black, the tibiæ near the base and the middle of the hind femora more or less infuscate. Surface with rather long, sparse, whitish pubescence. Head (with the prominent eyes) about one-fourth wider than the prothorax, front intricately rugose, antennæ shorter than the head, first and second joints large and stout, third a little longer than the fourth, club regularly ellipsoidal pointed at the tip. Prothorax rugose, about one-fourth broader than long, widest in front of the middle, where the sides are gibbous, thence nearly parallel to the base, which is strongly beaded. Elytra about one-fourth wider than the prothorax and nearly twice as long as broad, subparallel, slightly narrower and dehiscent behind, humeri prominent, surface alutaceous, coarsely, closely and deeply but regularly punctured, the punctures becoming so large near the apex as to give rise to a reticulate appearance. In colour they are reddish, each with the posterior two-fifths and a submedian band black, the interspace bearing a transverse patch of more conspicuous silvery hairs. Margins coarsely serrate posteriorly. Beneath, the thoracic sidepieces are rugose. Legs with long, sparse, bristly hairs. Length, 3.25 mm., .13 inch.

The type was given me by Mr. Warren Knaus, who took it at McPherson, Kansas, September 30. It is quite different from any of the described North American species, and in view of the successful attention bestowed on the fauna of Kansas by Mr. Knaus, I have dedicated this pretty insect to him.

APHODIUS, Illiger.

A. Kansanus, n. sp.—Moderately robust, broader behind, convex. Colour, pale yellowish testaceous, shining, head more reddish, prothorax with irregular dark discal cloud, elytra maculate. Head without tubercles, alutaceous, finely and sparsely punctate, clypeus with broad, shallow emargination, edge slightly reflexed, without denticles, angles rounded, genæ moderately prominent, and bearing a few long bristles. Antennæ pale yellow. Prothorax broad, widest in front of the middle, sides fimbriate, arcuate, narrowing to the base, which is not regularly rounded, but more produced at middle, marginal line distinct, rather deep in some of the specimens; disk convex, finely alutaceous, the punctures somewhat larger than those of the head, sparsely placed, almost wanting near the hind angles. Elytra at base about equal to the prothorax, broader posteriorly, finely alutaceous, striæ rather fine and shallow, impunctate, intervals nearly flat, with a row of extremely fine serial punctures. Body beneath, smooth and shining, a few setigerous punctures on the thoracic segments and a row on the anterior edge of each segment of the abdomen, the last ventral with scattered setæ over the entire surface. Mesosternum opaque, not carinate. Legs moderately slender, anterior tibiæ smooth on their outer faces, tridentate, apical tooth normal, long and pointed, the second large, the upper one small, margin above this tooth not crenulate. Hind femora with a few setigerous punctures, tibiæ fimbriate at apex, with rather large, unequal spinules, the transverse ridges practically obliterated, first joint of hind tarsi a trifle shorter than the next three. Length, 3 mm., .12 inch.

This insect belongs to that group of *Aphodius* in which the scutellum is short, and may be placed in Dr. Horn's group Ic, where it will follow *A. larrea*, from which it differs in size, colour, the strong marginal line of the prothorax, and presumably in the secondary sexual characters which are well marked in *larrea*, though my series of several *Kansanus* show no definable differences in those parts usually affected. The maculation of the elytra in *Kansanus* is of a simple type, consisting of an indefinite, broken arcuate band composed of several detached longitudinal brownish spots, reaching from humerus to humerus and crossing the suture in front of the middle; the suture and a small subapical spot also brownish.

For a good series of this interesting beetle, I am indebted to Mr. Warren Knaus, who took it in some numbers at Englewood in southwestern Kansas.

ELAPHIDION, Serv.

E. Fuchsii, n. sp.—Rufo-castaneous, shining, clothed with rather long, whitish, recumbent pubescence that does not conceal the surface. Form moderately elongate. Head with rather deep, longitudinal frontal impression, front coarsely and moderately densely punctate, the punctures becoming closely cribrate in the occipital region which, with the vertex, is indistinctly carinate. Antennæ (male) scarcely attaining the tip of the elytra, pubescent and sparsely hairy, very feebly serrate, third joint with a short internal spine which is less than one fifth the length of the fourth joint, fourth and fifth joints still more feebly unispinose. The third and fifth joints are about equal in length and are a trifle longer than the fourth; the outer edges of the third and following are compressed and rather sharp, eleventh constricted and suddenly smaller near the tip. Prothorax ellipsoidal, convex both ways, sides regularly arcuate, base broader than the apex, hind angles distinct; disk coarsely and closely punctate, a poorly defined median line, best marked just behind the middle where it is smooth and elevated. On each side are two elevations which correspond to the callosities usually found in this genus, but they are not different in sculpture from the rest of the surface. Scutellum rounded, finely emarginate behind and clothed with fine, dense whitish pubescence. Elytra broadest across the humeri, humeral umbone limited internally by a distinct impression; sides slightly convergent towards the tip, no well-defined costæ, though faint traces may be seen. Punctuation deep, rather coarse, well-separated, much finer towards the tip; apices not quite regularly separately rounded, with a moderately long, sharp sutural spine, outside of which is a short tooth. Body beneath finely scabropunctate, punctuation closer than above. Legs paler, tibiæ carinate, tighs not toothed nor spined. Length, 21 mm, = .84 inch.

This is one of the forms connecting *Elaphidion* with *Aneflus*, and I quite agree with Major Casey that the latter genus is untenable under the present definition. The type is a male from Independence, California, where it was captured by myself, about the middle of July, by beating desert shrubs. The female is slightly larger, less slender, the antennæ only about two-thirds the length of the body and the apex of the elytra is scarcely spinose, the spines being much reduced.

The relationships of this species are sufficiently well indicated by the characters given in description. It is evidently very distinct from all of our other species in the combination of antennal and elytral characters.

ZONITIS, Fabr.

Z. zonitoides, Duges.—At Alpine, Texas, I took a few specimens of an insect which I refer to this species, "a widely distributed form in the highlands of Mexico and Guatemala" (Champion, *Biologia Centrali-Americana*). It resembles *Z. sparsa*, Lec., but is at once known by the black head, shorter maxillary processes and more densely punctured elytra. It belongs to the genus *Nemognatha* as defined by LeConte and Horn. Major Casey has suppressed *Nemognatha* (Illiger, 1807), I think properly since the discovery of new Mexican forms has shown the invalidity of the only character (the length of the maxillary processes) upon which it has hitherto been separable from *Zonitis*. That author has also united *Gnathium* with *Zonitis*, the slight thickening of the tips of the antennæ scarcely warranting the continuation of the former name as a generic term. The course outlined above will, however, necessitate some changes in specific nomenclature; thus *Z. immaculata*, Say, becomes preoccupied by *Z. immaculata*, Ill., and I propose to designate the former species by the name *Z. Sayi*, in memory of its pioneer describer.

Z. Californica,ⁿ sp.—Elongate, convex, shining, with sparse, bristly pubescence. Brownish, head piceous, elytra obscure, brownish yellow. Head with coarse, deep punctures, covering the entire surface, except a small callus between the eyes, more crowded and confluent just above the antennal insertions, antennæ thickened externally, third joint not quite twice the length of the second, evidently longer than the fourth, maxillary processes about half as long as the body. Prothorax broader than long, wider in front of the middle, sides narrowing slightly to the base and more rapidly and arcuately to the apex, basal margin nearly straight, the bead high and well marked; disk uneven, with coarse, deep, scattered punctures, irregularly disposed. Elytra at base much wider than the prothorax, finely rugulose but shining, punctures of moderate size, confused at base, but sparser, and forming rather regular rows on the disk. Body beneath shining, legs punctured, spurs of the hind tibiæ unequal, tapering to tip, the inner one much more slender. Length, about 5 mm., .20 inch.

I collected this species in great numbers in the mountains near Tehachapi, California, several years ago, and have distributed it as new to many museums. It is not closely allied to any of our native species of *Gnathium* (to which division it belongs by the antennal structure), the coarsely and closely punctured head serving by itself as a good differential character.

IULUS IMPRESSUS (?) IN THE CORN-FIELD.

Iulidæ are not insects, and my only hope of getting this note on record is in that their work in the corn-fields of the Middle West may be easily confused with that of several very different species of insects.

In the autumn of 1882, when the larvæ of *Heliothis armiger* were very abundant in the corn-fields of Northern Illinois, I noticed that some ears, instead of having been attacked at the tip, had been entered from without indiscriminately along the length of the ear and directly through the husks. In such cases the depredator had penetrated the husks, leaving a neat circular hole about the size of a No. 4 shot. After reaching the ear it continued to work inward, penetrating a kernel, and on reaching the germ changed its course and tunnelled parallel with the cob, eating out the germs of kernel after kernel in the row, or sometimes changing over to an adjoining row of kernels. I soon found that depredations of this sort were not due to *Heliothis*, but to a Myriopod thought to belong to this species. Here, except to the most careful observer, was an injury caused by a single organism, whereas, in truth, there were two depredators, and but one of them an insect at all.

In early September, 1904, in a field of corn near Rochester, Minnesota, I was one morning astonished to find what seemed to be the same species of *Iulus*, infesting the ears of unripe corn in a different manner; in this case feeding on the green silk and leaving the ears with much the appearance of having been ravaged by beetles of the genus *Epicauta*, or *Diabrotica* perhaps, or even grasshoppers. There was hardly a hill of corn to be found that did not show evidences of having been ravaged, in many cases the ears being entirely denuded of silk. At this time, about 9 a.m., as many as four of the *Iulus* were to be found in the silk of belated ears, sometimes eating off the silk to the kernels, but in no case were they observed to attack the latter. From the fact that many of the creatures had seemingly finished their breakfast, and were to be found on the leaves or among the husks, and, later in the day, none were to be found feeding, it is possible that they depredate only in the cool of the day. Mr. Chas. N. Ainslie, of Rochester, who was with me at the time, made some later observations for me, and wrote me afterwards that they were even more plentiful than when I was there, he having found as many as ten individuals within a radius of fifteen inches about one hill of corn, their numbers being greatest near the margin of the field. In the case of Mr. Ainslie, the observations were made toward evening, thus indicating crepuscular habits.

It is quite possible this may prove to be some other species than *Iulus impressus*, but it is the very common species of the Middle West, and its work may be easily mistaken for that of insects.

F. M. WEBSTER, Urbana, Ill.

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

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

(Continued from page 156.)

309. *M. Dодii*, Smith.—(CAN. ENT., XXXVI., 152, June, 1904)
 Described from Calgary and from Bullion Park, Colo. The type is a Calgary specimen at Rutgers College, and I have two ♂ co-types. The description says: "Resembling *Tacoma* and *rugosa*. *Rugosa* is a smaller, less irrorate, more sharply defined species, with ordinary spots of different form, s. t. line hardly indented, costal region gray, and colour of secondaries more decidedly yellow." A year's endeavour to procure *rugosa* for comparison has elicited a single ♂, in perfect condition, through the kindness of Dr. Fletcher. The specimen comes from Mr. C. H. Young, of Hurdman's Bridge, which I believe is within about 12 miles of Ottawa. It is hardly below the average size of *Dodii*, but almost entirely lacks the rusty red-brown suffusion so characteristic in that species. As it is reasonable to suspect similar variation in discoidal spots to *Dodii*, I will not compare them. There is practically no trace of the **W** in s. t. line, rather prominent and constant in *Dodii*, and unlike that species, this line is preceded by black dentate points. The basal half of costal region is gray, which is never the case in *Dodii*, and there is a distinct black basal streak reaching to t. a. line, of which the new species never shows any trace whatever. The secondaries in *Dodii* vary much in shade, but most of them are quite as yellowish as in my *rugosa*. Presuming that this Ottawa specimen is not altogether off type, I feel pretty safe in saying what I have long suspected, viz.: that Dr. Holland's figure of *rugosa* is *Dodii*, which, on the whole, seems more likely to be confused with *Tacoma*. Fairly common at light and treacle. June and July.

310. *M. lilacina*, Herv.—Common. July to middle August. A widely variable species, which I have for years been trying to separate into two. My series at present consists of 72 specimens, about one-third ♀♀, and there seems after all to be every intergrade between the two extreme forms. One form is of a dirty, bluish-gray, with rusty shadings above the median vein. The maculation is very indistinct, and there are no contrasts, even fresh specimens often having a very sordid appearance. The other extreme form has marked contrasts between the light and dark shades. Such specimens sometimes have the orbicular and median and sub-median veins centrally, very conspicuously whitish, the

claviform thickly outlined with black, and hind margin and s. t. space rather contrastingly pale compared with the rest of the wing. Judging from a recent letter to me, Sir George Hampson seems to have confused some specimens of this form which I sent him with *Dodii*, which has something of the same range of variation, some specimens showing very much the same contrasts, but always much redder. I am not always sure of unset specimens, but no forms of *lilacina* and *Dodii* which I have seen are really alike. In fact, *lilacina*, in having less of the rusty-red, a more direct s. t. line, and an occasional tendency to develop a basal streak, is really a good deal more like *rugosa*. Prof. Smith has repeatedly seen both forms of my *lilacina*, and I have specimens of each bearing his own label. The specimen figured in Dr. Holland's book is about intermediate between the two extremes.

311. *M. acutermis*, Smith.—(CAN. ENT., XXXVI., 153, June, 1904). Described from 5 ♂♂ and 2 ♀♀, partly Calgary material; the rest from Cartwright, Man.; B. C., and S. Dak. A ♂ co-type and five other specimens are in my collection. Very rare, and only taken during 1893 and 1899. End June to middle July. Its author states: "Related to *Goodellii* in general character; but is smaller, darker, the maculation barely traceable, and the apex of the primaries distinctly better marked." Until recently I had this species standing as *Goodellii*. The type is a Calgary specimen and is at Rutgers' College.

312. *M. obscura*, Smith.—Sometimes very common at treacle in June. This species was formerly sent out by me in considerable numbers as *Hillia crasis*, under which name Prof. Smith had placed the form in his own collection. The species varies from a dark, reddish-brown to almost black, but always with a reddish tinge. The *vigilans* form of *crasis* is somewhat of the same colour, but though there is a similarity in general type of maculation between the two species, they are not really alike. I obtained ova of *obscura* in 1894. The larvæ hatched on June 30th, and fed on *Anemone patens*. They had all pupated but two on Sept. 3rd. I have no further notes.

313. *M. ectrapela*, Smith.—Described from a ♂ taken by Mr. T. E. Bean at Agnes Lake, near Laggan, Alta. (B. C. in error), 6,800 feet, on Aug. 21st, and from a ♀ taken at 6,000 feet in Garfield Co., Colorado, by Mr. Bruce. The description tells us: "The species has the wing form of *ectypa*, and the same general type of maculation, but is of a somewhat sordid dull brown." The type is at Washington.

314. *M. renigera*, Steph.—Common July to middle Aug.

315. *M. lucina*, Smith.—Fairly common. July and Aug. For discussions on the synonymy of the *olivacea* and *comis* group, vide Trans. Am. Ent. Soc., XXVII., 230, et seq., June, 1901; Journ. N. Y. Ent. Soc., XI., 1903, p. 14; and Proc. U. S. Nat. Mus., XXVII., p. 853, 1904, the latter being Dr. Dyar's "Kootenai list," previously referred to. I submitted a good series of Calgary specimens to Prof. Smith two or three years ago, and he referred them to *lucina*, remarking that they seemed "to emphasize the difference from *olivacea* and the close relationship to *altua* I think you prove fairly well that we have races only. But *altua* and *lucina*, though closer than I originally supposed, are not thereby brought nearer to *olivacea*." Unless he has changed his opinion, his listing them as all distinct is perhaps a trifle misleading. *Lucina* was described from Manitoba and Yellowstone Park, Wyo., and I have a ♂ co-type and two other ♂♂, much alike, from Winnipeg. *Altua* was described from Glenwood Spgs., Colo.; South Dakota; and Hot Springs, New Mexico (one ♀, elevation 7,000 feet). The latter specimen Prof. Smith has kindly sent me as a co-type, together with two Glenwood Spgs. ♀♀. I can match the *altua* ♀♀ much more nearly in my Calgary series than I can my Winnipeg *lucina* ♂♂. The latter to my eye have more of a tendency to an olivaceous shading than is visible anywhere in the local series. Beyond this I have had no opportunity for comparison with other material. Viewed by itself, my series varies from untinted shades of light and dark gray in the ♂♂, to dark ♀♀ without contrasts. The majority of the specimens are, however, tinted, especially in basal and s. t. spaces, the tints ranging from yellowish green, through sienna brown, to an almost rosy red. This often is faintly diffused throughout the specimen. As Dr. Dyar seems to have studied an enormous amount of material, a copy of his latest reference of the names as given in the Kootenai list may not be out of place.

OLIVACEA, Morr. Atlantic region.

obscurior, Smith.

race *lucina*, Smith. Western prairies.

race *altua*, Smith (= ? *vau-media*, Sm.). Rocky Mountains.

megarena, Smith.

race *petita*, Smith. Pacific coast and mountains.

COMIS, Grote. Pacific coast and mountains adjoining.

obnigra, Smith.

rectilinea, Smith.

male *petita*, Smith.

davena, Smith.

316. *M. sutrina*, Grt.—Very rare. End May and June. One of my specimens has been compared with the types by Sir George Hampson. Prof. Smith says in his Catalogue: "It resembles *lustralis* more than it does *cuneata*, but the male antennæ are simple. In its position next to *cuneata*, its resemblance to *lustralis* will serve to distinguish it." Since that was written, a closer acquaintance with the species has caused him to change his opinion, for in his "Notes on Mamestra," in Journ. N. Y. Ent. Soc., XI, No. 1, p. 16 (March, 1903), he says: "*Sutrina*, which is so nearly like *cuneata* that it might be readily confused with it, has the male characters entirely different." I have only had opportunity of comparing it with one specimen of each; *lustralis* sent me named by Dr. Barnes, and *cuneata* from Victoria, B. C. I should certainly never have remarked upon any resemblance to *lustralis*, whilst its likeness to *cuneata* is very decided. That specimen differs from it, however, chiefly in having the s. t. line obsolete, the orbicular oblong, oblique, instead of rounded, and a small golden-yellow speck in s. t. space near anal angle. All my *sutrina*, too, have a gray patch in median area between claviform and reniform. My specimen of *cuneata* shows no trace of this whatever. A further note on *sutrina* and its genitalia will be found in Ent. News for December, 1898. It has also been taken in Yellowstone Park, Wyo. The type is from Colorado.

317. *M. lorea*, Grt.—Fairly common. End June and July.

318. *M. larissa*, Smith.—Described from here, and figured with the description. Not common. June and early July. Its author says: "The ♂ is a bright specimen and reminds me at first sight of *Litholomia napæa*. The species belongs in the series with *vicina*, but differs from all the forms of that species represented in my collection by the absence of a black basal streak." The suggestion of *napæa* at first sight is undeniable, though, when closely examined, the two are so unlike that comparison here would be odious. Most of my specimens have a fine, black basal streak. They differ from the species I hold as *vicina* amongst other respects in having the claviform ovate rather than sharply dentate. The name has been by some collectors looked upon as a synonym of *anguina*, Grote, but on

my referring the matter to Prof. Smith, he says: "I doubt their identity. I have been inclined to believe, as you suggest, that the two are identical, but have recently procured a couple of specimens of the Eastern form, which make me believe that *larissa* can be held as sufficiently distinct. The trouble is that *anguina* is so very rare in collections that I have not been able to get together a sufficient amount of material to give me its range of variation." I sent the species to Sir George Hampson, who reported: "*anguina*, Grote; like type." *Anguina* is recorded from Colorado and Nebraska, as well as from some of the Eastern States. Dr. Holland's figure of it is not clear enough to enable me to judge from. The type of *larissa* is at Washington.

319. *M. pensilis*, Grt.—Not common. Middle June to middle July. I had the species standing as *Hadena characta* until quite recently, when Sir George Hampson corrected the error, pointing out the hairy eyes. He added: "They are not much like each other." In that case Dr. Holland's figure of *H. characta* is really *M. pensilis**, as it is exactly like the present species. If such is the case, it is probable that with this, as also with *Dodii*, I am partly responsible for the error myself, having supplied the specimens for many of Dr. Holland's figures under erroneous names, by which I then knew them. From Dr. Dyar's remarks under this species in his Kootenai list, there seems to be confusion of it with *vicina*. Taking Holland's *characta* ♂ as *pensilis* ♂, his figure of *vicina*, ♀, which is like the species I hold as such named by Dr. Fletcher, gives rather an exaggerated idea of the ordinary differences, the sexual dimorphism being at least as strong as the true specific differences. A pair sent me for naming by Mr. T. N. Willing, from Regina, seemed to me a dark, even-coloured variety of the Calgary species I have as *pensilis*, and I named it so with some doubt. Mr. Willing subsequently showed me a similar ♀ from the same locality named *vicina* by Dr. Fletcher, and after comparing Dr. Holland's figure, I let the name stand. I can match Mr. Willing's ♂ by one kindly lent me for comparison by Mr. Criddle, of Aweme, Man. My *pensilis* is clearer gray, the maculation plainer, and s. t. space slightly contrasting with central shade. In *vicina* this space is scarcely paler. Of the two it is what I refer to as *vicina* which most nearly resembles *larissa*.

320. *Neuronia Americana*, Smith.—Very rare, as a rule, but was rather common at light in 1894. I believe none of the genus are treacle-

*Dr. Dyar tells me that this is the case.

goers. Middle Aug. to middle Sept. A figure of the type is given with the description, and seems to indicate a much darker specimen than any I have seen. The figures in Ent. News for December, 1895, and in Dr. Holland's book are both good ones. The description was made from "male and female in the collection of Mr. A. Schoenborn at Washington, received from Mr. Titus Ulke." They were taken at Boulder, Mont. I cannot say where the specimens are now.

321. *Dargida procinctus*, Grt.—Apparently a migrant, and, as a rule, comparatively common. Have taken it at treacle from June to early October. Fresh specimens in Aug. and Sept.

322. *Scotogramma luteola*, Smith.—Described from Laggan (B. C. in error), 6,700 ft., July and Aug. (Bean.) I took it in fine condition on Slate Mt., Laggan, and Saddle Back, near Lake Louise, at and above the timber line (about 7,000 feet), and at about the same elevation on Sulphur Mt., Banff. It appeared to be common. It would sometimes take wing readily, and at others would sit exposed to the sun on stones, which it exactly assimilated in colour, and drop off, feigning death, when an attempt was made to pill-box it. This was on Aug. 8th to 10th, and many specimens were perfectly fresh. I have seen a specimen taken on Mt. Rundle, Banff, labelled June 27th. The maculation is not often as clear as indicated in the figure accompanying the description. The type is in the U. S. National collection. I took a few specimens, some of them a bit worn, near Agnes Lake, Laggan, on July 20th, 1904.

323. *S. uniformis*, Smith.—Described from a ♂ taken by Mr. Bean at Laggan, on July 31st, 1891, far above timber (7,000 ft.). Other specimens were taken. A figure accompanies the description. The type is in the National collection at Washington. I have specimens fitting the description in my series under *luteola*. I may be mixing the two, or *uniformis* may possibly be an extreme form of that species.

324. *S. phoca*, Mæschl?—Very rare. July. I took two specimens and saw several more flying in sunshine on Slate Mt., Laggan, at about 6,500 ft., on Aug. 8th, 1900. Three specimens in the foothills at Lineham's lower log camp on Sheep Creek, July 12th, 1896. A few have been taken here at head of Pine Creek, one of them at light, the rest at flowers at dusk. A single ♀ at Laggan, on flowers, near the station, July 16th, 1904. It is probably not uncommon in the foothills. Prof. Smith named it with a query.

325. *S. inconcinna*, Sm.—Three specimens in fine condition, from "Lineham's log camp" locality (vide supra), one at light, the other two

at flowers at dusk. Middle July. The species was described from Colorado. I took a specimen at Laggan, on flowers, in sunshine, near the station, on July 16th, 1904.

326. *Anarta cordigera*, Thunb.—I have seen a ♀ taken by Mr. N. B. Sanson on Mt. Rundle, Banff, on June 27th, 1900, which I believe to be this species.

327. *A. melanopa*, Thunb.—Three ♂♂, one in fine condition, the other two worn, on "Saddle Back," near Lake Louise, Laggan, at timber line (about 7,000 feet), Aug. 10th, 1900.

328. *A. quadrilunata*, Grt.?—One ♂, Slate Mt., Laggan, above timber, between 7,000 and 7,800 feet, Aug. 8th, 1900. Prof. Smith says he has a ♀ from the same locality, and adds: "They differ from Colorado examples in larger size and obsolete maculation of primaries. A different species is not excluded."

329. *A. lapponica*, Thunb.?—A single ♀, taken by Mrs. Nicholl near the summit of Mt. St. Piran, Laggan, at about 8,500 feet, on July 20th, 1904, is in my collection, and has been referred doubtfully to this species by Prof. Smith.

330. *A. sp.*?—A few years ago Prof. Smith referred this species doubtfully as a var. of *Zetterstedtii*, Staud., from which it differs, he said, in having a white disk on secondary. Recently he advised me to leave it unnamed until I could discover Sir George Hampson's opinion about this and other species in the genus. It is a common species at and above timber line (about 7,000 feet) at Laggan. End of July and early August.

331. *Nephelodes pectinatus*, Smith?—Not rare at light some seasons, entirely absent in others. End of August. I have only six specimens, all ♂♂, which show a considerable range of variation, from a very pale yellowish luteous to a handsome dark olive brown, or rosaceous mixed with olive. A specimen of the last mentioned form was named *pectinatus* by Prof. Smith a few years ago. Quite recently I sent him one of the olive-brown forms, together with a specimen from Victoria, B. C. He commented: "*Pectinatus* I believe, but very unlike the only example in my collection, which comes from Oregon. In your specimens the bristle is distinctly more obvious than in mine, where it is scarcely to be dignified by that name in proportion to the long point. On the other hand, in my local specimens the bristle is as long as the branch. There may be more variation in the antennæ than I have supposed, and this may be to some extent geographical." The species was described from two ♂♂ from

Corfield, Vancouver Island, and vaguely "British Columbia." It is said to resemble *minians*, but has a difference in the male antennæ. "In *minians* the pectinations are rather short, and lengthened by a curved bristle at the tip. In *pectinatus* this bristle is absent, but the branches themselves are longer, and a little enlarged towards the tip. The differences are thus obvious, and emphasize the rather scant superficial character. The specimen from B. C. has a peculiar greenish tinge to the ground colour which I have not seen in the eastern species." I rather suspect that this is the form I have above referred to as olive brown. The antennal differences are not obvious to the naked eye. A figure of the species accompanies the description. I have compared my Calgary series with specimens from Aweme, Man.; Regina, Assa.; Victoria, B. C.; and with *minians* from New Brighton, Pa., and from Chicago. Some of the specimens from the last locality were sent me as var. *violans*, and differ from what seem to be typical *minians* in being paler and having less of the bronze, olive or violaceous tints. All the western specimens differ from the eastern in the form of ♂ antennæ above referred to, except that in none of my specimens is the bristle entirely lacking. Otherwise the differences appear to be merely of colour and shade, and are not easy to define. Some of the eastern specimens are very large, but they show a considerable variation in size, and the smallest are smaller than the average of the western series. As a whole *minians* is more richly coloured and possesses more lustre, though occasional specimens are scarcely separable except by the ♂ antennæ. The series of nine specimens from Calgary, Regina and Aweme, are obviously all one species, those from the latter place coming nearest to *minians* in colour of primaries. The secondaries of these nine are, however, very much paler than in the majority of my *minians*. The Victoria specimens, on the other hand, have much more even, duller smoky secondaries than *minians*, and are throughout rather more sordid in appearance than anything that I have from east of the Rockies. From the locality, I presume them to be typical, so that the prairie form is probably at least a fairly well marked local race. The type of *pectinatus* is at Washington.

Incidentally, Prof. Smith has very kindly spared me one of his Winnipeg specimens of *tertilis* ♂. This he described from that place in Journ. N. Y. Ent. Soc., XI, p. 19 (March, 1903), and says: "The species resembles the eastern form in general appearance and type of maculation, but is decidedly smaller throughout. The fringes are more even, with hardly a trace of scalloping, and there is no obvious median shade on the

primaries. Add to this a distinct difference in the genitalia of the male, and the specific separation proves inevitable." If the specimen was placed with the Chicago and east coast series, and all labels removed, I defy any man to pick it out, without recourse to the genitalia, by any one of the characters mentioned. The type of *tertialis* is in Prof. Smith's collection at Rutgers College.

332. *Leucania unipuncta*, Haw.—Rare on the whole. Apparently a migrant. Worn specimens end of June and July, fresh specimens in October. Treacle.

333. *L. minorata*, Smith.—Not rare. July to middle Aug. The name is the one given me to the species by Prof. Smith. The species was described from three ♂♂ from California and Oregon, which were said to resemble *oxygale*, Grt. "But are smaller throughout, the ground colour reddish, the secondaries darker." The only locality given for *oxygale* in either Dr. Dyar's List or Prof. Smith's Catalogue is Colorado, so I presume it was described from there. In the Revision of the genus, however (Proc. U. S. Nat. Mus., Vol. XXV., pages 159-209, 1902), both in the table on page 164 and under the descriptions, Prof. Smith distinctly treats of *oxygale* as having the darker secondaries of the two. He there describes *luteopallens* from Canada and the eastern States as distinct from both in being paler throughout, and claims that all three are separable from European *pallens*, citing *minorata* as its American representative. Dr. Dyar in his Kootenai List records *oxygale* as common at Kaslo, and refers all four names to one species, treating *oxygale* and *luteopallens* as geographical races of *pallens*, and *minorata* as a varietal and not racial form of *oxygale*. I have a good series of *luteopallens* from several places in the east, and specimens exactly like the Calgary form from Victoria, B. C., and Manitoba, and a Kaslo series from Dr. Dyar also inseparable from it. As a whole my eastern specimens are certainly paler and less streaky throughout, and have less black on secondaries than the western specimens, but the extremes overlap. The type of *minorata* is at Washington, and is figured with the description.

334. *L. albilinea*, Hubn.—Four ♂♂ only, June 30th to July 21st, in three different years. They have the secondaries dark smoky throughout, scarcely or not at all paler at the base. At light.

335. *L. diffusa*, Walk.—Very rare. I have seven ♂♂ only, May 20th to July 22nd. Light. The primaries are paler in colour than the preceding, and secondaries smoky in outer half only. I had the two mixed until about a year ago, but a close examination brought me to

believe I had two species, and a specimen of each has now been named as above by Prof. Smith. I have examined over seventy specimens from eastern Canada and the States, and find the majority of them like my Calgary *diffusa* series. I have so far only seen one ♂ (from Sherborn, Mass.), with secondaries practically as dark as my palest Calgary *albilinea*, but this, in common with the majority of them, has slightly paler primaries. It is from Sherborn, Mass., that I have received the darkest eastern ♂♂. But two or three ♀♀ from New Brighton, Pa., and one from Ottawa, are exact mates for the four Calgary *albilinea*. The range of variation in the eastern specimens is considerable, but I have entirely failed in all attempts to separate them into two species, as they seem to grade right through. The smallest specimens seem as a rule to be the palest, but in the "Revision" *diffusa* is stated to be larger as well as paler than *albilinea*. Were it not that my two short Calgary series are so sharply contrasting, I should not try to keep the names separate. What Dr. Holland figures as *albilinea* is exactly like what I hold as Calgary *diffusa*.

336. *L. heterodoxa*, Smith.—Described partly from Laggan material (B. C. in error), 5,000 feet, July 2nd, T. E. Bean. The type is from California, and is at Washington.

336a. *L. megadia*, Smith.—Described partly from Calgary material. The type is a Calgary specimen, and is at Rutgers' College.

The above two forms, which I agree with Dr. Dyar in treating as one species, are generally common at Calgary. *Megadia* has a black basal streak which is lacking in *heterodoxa*. True *heterodoxa* is by far the least common form, but every intergrade can be found. This appears to be the western representative of *insueta*, from which it differs mainly in lacking a reddish tinge, though Prof. Smith in his "Revision" mentions a specimen as red as any *insueta* he ever saw. None of my specimens have any reddish tinge, but Mr. F. A. Merrick has kindly lent me a Chicago specimen of *insueta* which lacks it, and in which the basal streak is hardly traceable. *Insueta* seems to have somewhat paler secondaries. The figure of *heterodoxa* given with the description shows the basal streak, and is therefore really a better representative of *megadia*. I sent two of my ♂♂ to Sir George Hampson, who says they agree with the type of *dia*, Grote. *Dia* was described from California. So also was *heterodoxa*, in part, and *megadia* is stated to occur there.

337. *L. multilinea*, Walk.?—Not rare. End July and early Aug. Though I query the name, I feel fairly confident that it will ultimately

prove to be the western form of that species, from which it differs in being a little larger and having the secondaries not quite so clearly white, and generally slightly smoky outwardly. I have compared over a dozen specimens from the eastern States, which, from the description given in the "Revision," and from Dr. Holland's figure, I believed to be true *multilinea*, and an eastern specimen so named for me by Prof. Smith has confirmed my belief. I received it from nearly every one of my correspondents, who sent me *phragmitidicola* mixed with that species, but had no difficulty in picking it out, and from the very first associated it with the Calgary form. My local series runs extremely near some dark streaky forms of *anteroclara*, and though I have for years kept the two in different series, it is only during the last few months that I have at last succeeded in drawing a line between them. I have a pair of specimens marked "*anteroclara*, co-type," by Prof. Smith. The ♀ is the ordinary form of that series, and I am at present assuming that it is of the same species as the actual types. The ♂ is my No. 337, but rather a rubbed specimen. Prof. Smith still confuses the two, but that is probably only because I have not yet sent him a good series of this, which is far less common than *anteroclara*. Reference to Dr. Holland's figure of *multilinea* will show, apart from the pale veins, three contrastingly pale streaks on the primaries. The first runs from the base, below the subcostal vein, through the cell, and thence obliquely to the apex. The second runs also from the base to hind margin between median and submedian veins; and the third borders the inner margin, but does not run quite from the base. These pale shades are a conspicuous feature in all my eastern *multilinea* and my No. 337. *Anteroclara* as a rule is very much more unicolourous, but in the most streaky specimens, though the dark intervening shades are occasionally almost as conspicuous, the pale shades do not seem to contrast in the same way. All my *multilinea* have a marginal row of minute black specks on secondaries, usually most conspicuous beneath. These are occasionally noticeable in *anteroclara*, but are not nearly so constant. Another characteristic of *multilinea* is the greater amount of smoky shadings on primaries beneath. Comparing the two Calgary series alone, besides the above-mentioned differences, *anteroclara* has rather darker secondaries, but altogether the variation is such that single specimens sometimes require very careful comparison to determine. Whilst the sexes in my eastern *multilinea* and Calgary *anteroclara* are about

equally divided, I am not aware that I have yet seen a Calgary ♀ of *multilinea*. But I have compared a ♀ from Cartwright, Man., kindly loaned me by Mr. F. A. Merrick, of New Brighton, Pa., who also sent me a ♂ from the same locality. The two specimens are practically alike, and resemble the Calgary form in every detail.

338. *L. commoides*, Gr.—Common. July and early Aug. Easily separable from any of its allies known to me by the uniformly dark smoky secondaries in both sexes. The darkest shadings on the primaries are black, instead of brown as in *multilinea*, but some specimens are very like the Calgary forms of that species and of *anteroclara* when the wings are closed. A distinctive feature not mentioned in the "Revision," but well shown in Dr. Holland's figure, is the narrow dark shading, sometimes faint, but more usually rather prominent on upper margin of median vein. Eastern specimens do not seem to differ.

339. *L. anteroclara*, Smith.—Described partly from Calgary material. The types are from Calgary. The ♂ is at Washington, and the ♀ at Rutgers College. A pair marked "Co-type" are in my own collection, but the ♂ I have above referred to *multilinea*. Always common, sometimes very abundant. End June to *Aug. On one or two mornings during 1902 I saw moths emptied out of the Calgary arc light globes literally in pints. Quite ninety per cent. of them were this species. It seems to be a close ally of *phragmitidicola*, Guen. Under the description Prof. Smith says: "Comparing two series, their distinctness is obvious; comparing selected individuals of each, the sexual characters might have to be resorted to. It is suggestive of a local form that I have no *phragmitidicola* from the range given for this species, nor any example of this species within the range given for *phragmitidicola*." Elsewhere he states: "*Anteroclara* as a whole is a little larger, a little broader winged, with somewhat less pointed primaries. It is more yellow in colour, less streaky in appearance, the black dot at the end of the median vein often wanting, never prominent, transverse posterior line reduced to two small interspaceal dots, and the upper margin of the pale median line not in any way relieved. The secondaries, especially in the ♀, have a smoky appearance, and altogether this seems a duller, more even species than its ally." To the above I would add that the t. p. line is sometimes entirely wanting.

(To be continued.)

DESCRIPTION OF THE LARVA OF *DELPHASTUS PUSILLUS*, LEC., WITH NOTES ON THE HABITS OF THE SPECIES.

BY W. E. BRITTON, NEW HAVEN, CONN.

In collecting insects at Poquonock, Conn., July 18, 1904, my assistant, Mr. B. H. Walden, found coccinellid larvæ feeding upon a species of *Aleyrodes* which is probably undescribed, and fairly common there upon the leaves of hazel, *Corylus Americanus*. These larvæ were brought to the laboratory, and were fed upon *Aleyrodes vaporariorum*, Westw., which they ate greedily. On July 23rd two had moulted; on the 28th, these had changed to pupæ, and the third larva had begun to devour one of the pupæ—his aleyrodid food supply having become exhausted.

From the uninjured pupa an adult emerged August 2nd, and the remaining larva pupated August 1st, the adult emerging August 8th. The adult is a small black beetle, about 1.5 mm. in length. Specimens sent to Washington were determined by Mr. E. A. Schwarz as *Delphastus pusillus*, Lec. This species has been placed in the genera *Æneis* by LeConte, and *Cryptognatha*, by Crotch and Horn, but Casey has erected the genus *Delphastus** on account of the difference in structure. *Delphastus* now includes four American species.

In searching the more accessible literature of American entomology, I fail to find any description of *Delphastus pusillus*, or any reference to the feeding habits of the species, though the habits of most coccinellid larvæ are known. I therefore give the following description and notes as an addition to the knowledge of this species, though it is possible that a description of this larva has been published, and that I have overlooked it.

When first taken, this larva was uniformly light gray or dirty white in colour, with dark spots on the dorsum of the first thoracic segment. After moulting, the general colour was much darker, and the following description applies to the final stage of the larva before it changed to a pupa.

Larva: Length, about 4 mm.; greatest width, about 2 mm. Ground colour gray or dirty white, with a white median line extending the entire length of thorax and abdomen. There are two pear-shaped black spots on the front of the dorsum of the first thoracic segment, one on each side of the median line. Just back of these spots are a pair of larger dark gray or lead-coloured spots, one on each side of and close to the median line. A lead-coloured area appears on the lateral margins of the segment.

*T. L. Casey, Journal New York Entomological Society, Vol. VII., p. 111.

The second and third thoracic segments are similarly marked, but the spots are more elongated transversely, and all are gray or lead-coloured. The abdominal segments have one transverse spot or band each side of the median line instead of two as on the thorax. These spots and the marginal markings are of the same colour as those on the second and third thoracic segments. The markings are such as to give the appearance of a narrow median white line, with slightly broader, submarginal whitish lines, with margins and cross-bands of gray or lead-colour. Each segment of the body bears a number of short hairs. The legs are gray, tipped with white.

The head is gray and narrow, and can scarcely be seen from above when the larva is feeding. It attacks an aleyrodid, eating a circular hole in the dorsum usually of the thoracic region, and devours the inner portion, leaving the shell or skin. Many punctured empty skins were found on the leaves. The accompanying illustration is from a camera lucida sketch, and shows the appearance of the larva while feeding upon a specimen of *Aleyrodes*. (Fig. 12).

Pupa: Length, 2.5 mm., including the cast skin; width, 1.5 mm. Colour creamy white, cast skin gray, and covering about one-third of the caudal extremity. The pupa is fastened to the leaf after the manner of the *Coccinellidæ*.

The writer visited Poquonock September 12th, and tried to find more of these larvæ, but they had all transformed. A number of small black beetles were found on the hazel leaves, and, as was expected, proved to be specifically identical with the reared specimens. These were not seen feeding upon the *Aleyrodes*, which were very abundant at this time on the leaves; but the beetles were hurrying about over the leaves, as if hunting for something, perhaps food, possibly a place to oviposit, but more likely a sheltered place in which to pass the winter. These brief notes give no idea of the number of broods of *Delphastus*, but possibly the coming season may present an opportunity to continue the observations. From our knowledge of other *Coccinellidæ*, it may be assumed that there are at least two broods each season.

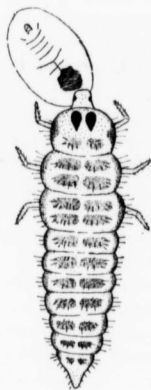


Fig. 12.

THE THREE RANATRAS OF THE NORTH-EASTERN UNITED STATES.

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

Several entomologists have discussed with me the question of the distinguishing characters of *Ranatra quadridentata*, Stal, and *Ranatra fusca*, Pal. Beauv., and in consequence I venture to set forth here briefly and plainly the differences between these two and *Ranatra Kirkaldyi*, n. sp., which I took for the first time in New York State.

A few preliminary remarks on this genus may perhaps be found interesting. The genus *Ranatra* was established in 1790 (sec. Kirkaldy) by Fabricius without a type being fixed, and under it he described *R. filiformis* and *R. elongata*, both from Tranquebar. In it naturally fell Linné's *Nepa linearis*, which Latreille in 1802 made the type of the genus. The described American species, exclusive of synonyms, are the following:

Ranatra Fabricii, Guérin, from Cuba.

Ranatra rabida, F. B. White, from Brazil.

Ranatra unidentata, Stal, from Rio Janeiro.

Ranatra quadridentata Stal, from Mexico.

Ranatra fusca, Pal. Beauv., from the United States.

Ranatra annulipes, Stal, from Brazil.

To these six it is my privilege to add a seventh:

Ranatra Kirkaldyi, n. sp., from the type localities, Putnam Co., N. Y., and Chicago, Ills.

Ranatra fusca, Pal. Beauv., and *R. quadridentata*, Stal, appear to have been much confused with each other, due to the very brief description of the former given by its author, and perhaps also to the fact that small specimens of the latter are hardly distinguishable from the former on a superficial examination. Palisot de Beauvois, after his extremely brief Latin description, makes a comparison between *R. fusca* and the European *R. linearis*, and, of course, in the absence of the latter for comparison, it is hardly possible to fix on the former with any degree of certainty. His description simply reads: "Greenish-fuscous, setæ shorter than the body, wings reddish-fuscous." The last is quite a noticeable character of the insect. There are to be found more than a few *R. quadridentata* in which the air-tubes are noticeably shorter than the body, but the wings in this species are hyaline, "very slightly infuscated," as

Stal puts it. On superficial characters for easy identification, they may be separated as follows :

With broad anterior femora.

With a blunt tooth near the tibial joint *R. quadridentata*, Stal.

Without a blunt tooth near the tibial joint *R. Kirkaldyi*, n. sp.

With narrow anterior femora, smooth, save for the middle

tooth *R. fusca*, Pal. Beauv.

R. Kirkaldyi can at once be distinguished from both *fusca* and *quadridentata* by its smaller size, being little over two-thirds the length of either of them ; short and much constricted prothorax, and very short air-tubes. *R. fusca* can be further differentiated from *quadridentata* by the much longer legs, the tarsal claws reaching nearly to the extremity of the air-tube, and the extremities of the femora of the third pair of legs attaining to the end of the penultimate abdominal segment ; by the prominent eyes ; and by the prothorax being slimmer and longer and unisulcate beneath ; while in *R. quadridentata* the legs are not unduly long, the tarsal claws of the third pair barely going beyond the middle of the air-tube, and the extremity of the femora going but little beyond the anterior margin of the penultimate abdominal segment ; the eyes moderately large ; and the prothorax more stoutly built and bisulcate beneath.

As *R. Kirkaldyi* is still undescribed, I briefly give its salient characters, prior to a full description to be published later.

Ranatra Kirkaldyi, n. sp.—Abdominis dorsum orange brown ; eyes small, not very prominent ; prothorax much constricted at the middle, bisulcate beneath ; wings smoky ; anterior femora broad, with a prominent tooth near the middle, otherwise smooth ; posterior tarsi extending beyond the middle of the air-tube ; air-tube shorter than the length of the abdomen ; legs banded.

Length from end of abdomen to tip of rostrum : Males 23 mm. to 26.4 mm., females 27 to 31 mm.

HEMEROPHILA KINCAIDIELLA, BUSCK.—A CORRECTION.—

This species, described by Mr. A. Busck, in the Proceedings of the United States National Museum, XXVII., p. 746, 1904, paper No. 1375, is *Sciaphila trigonana*, Walsingham. [Lepidoptera-Heterocera British Museum, Part IV., p. 22, 1879 ; Dyar's Catalogue, No. 5413 ; Smith's List, 1903, 5831.] The species is well figured by Walsingham, Plate LXV., fig. 7.—W. D. KEARFOTT, Montclair, N. J.

SOME BEES OF THE GENUS *NOMADA* FROM WISCONSIN.

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

Nomada Graenicheri, n. sp.—♀. Length, about 10½ mm.; black, with bright lemon-yellow markings, the only red is on base of antennæ, legs, and a little on mandibles; mandibles simple; anterior coxæ without spines; basal nervure meeting transverso-medial; third antennal joint slightly longer than fourth. This is a *Xanthidium* with the face black in the middle and with yellow lateral marks, like the European *N. succincta*. It has the strongest possible superficial resemblance to *N. modesta*, but in addition to the absence of spines on the coxæ, it differs thus: labrum dark, with a transverse yellow spot anteriorly; clypeus with a yellow mark on each side, pointed mesad; supraclypeal area with two minute yellow spots; lateral face-marks extending nearly to summits of eyes, obliquely truncate at end, and concave opposite the antennæ; mesothorax dull, coarsely but extremely closely punctured; metathorax wholly black; legs with a good deal of yellow, anterior and hind coxæ marked with yellow, the later copiously; all the femora behind, and the anterior and hind tibiæ behind, strongly blackened; all the tibiæ with yellow, the hind ones largely yellow, in front with a black spot, shading above into a rufous cloud, on the apical half; basal joint of hind tarsi dark, practically black on outer side, with a short yellow stripe posteriorly; abdomen narrower, and not so shiny; venter with broad yellow bands on the second and third segments, and a good deal of yellow on the third. The first three joints of the antennæ are mainly red, the rest black; posterior orbits with a narrow yellow stripe; upper border of prothorax, tubercles, transverse mark on pleura, two large spots on scutellum, and a stripe on post-scutellum, as well as five continuous bands on abdomen, all yellow. Tegulæ largely yellow; wings dusky, stigma dark ferruginous, nervures fuscous.

Milwaukee, Wisconsin, Aug. 16, 1903. (Dr. S. Graenicher).*

Nomada (Xanthidium) pseudops, n. sp.—♀. Length, about 9 mm.; red, with black and yellow markings; basal nervure meeting transverso-medial on the basal side; third antennal joint conspicuously shorter than fourth. Head broad, facial quadrangle about square, somewhat broadened above; labrum and under side of head with rather abundant white hair, face with less; cheeks with the anterior half red and the posterior

*Dr. Graenicher writes that *N. Graenicheri* is probably parasitic on one of the late summer species of *Andrena*, as it occurs with them on *Helianthus* spp.

half black, but no yellow; interocellar region, and about base of antennæ, blackened; labrum and lower corners of face yellow, the yellow extending as a suffusion, with no defined margin, across the clypeus and half-way up the sides of the face; antennæ entirely bright ferruginous, the flagellum stout; mesothorax coarsely roughened, red, with a median black stripe, but no yellow; prothorax black or almost, with its upper border and the tubercles yellow; pleura red, with a large triangular yellow patch in front; area between the wings and the hind legs black; metathorax red, with four yellow spots, the lower ones large, the upper round and placed on the sides of the enclosure, looking like eyes, the whole combination resembling a picture of a skull somewhat; tegulæ red, shining but punctured; wings moderately dusky, the tips darker, stigma bright ferruginous, nervures fuscous; legs red, hind femora blackened behind, anterior and middle femora with black behind at base; abdomen minutely roughened, rather shiny, red with broad yellow bands on segments 2 to 5, that on 5 interrupted laterally; first segment black basally, and with an obscure yellow band, the middle third of which is wanting; fifth segment fringed with silver-white hair; pygidial plate broad shovel-shaped; venter red, with a large transverse pyriform yellow mark on each side of segments 2 and 3, and two crescent-shaped yellow marks on 5.

Milwaukee, Wisconsin, June 8, 1903. (Dr. S. Graenicher.) Looks much like *N. Coloradensis*, Ckll., but smaller, and differing in many details.

Nomada sphaerogaster, Ckll., var. α .—♀. Length, about 8 mm.; black, with lemon-yellow markings, and some red, but none on thorax; mandibles and anterior coxæ simple; basal nervure passing a short distance basad of transverso-medial; third antennal joint a little shorter than fourth. Head and thorax coarsely roughened, and quite hairy, the dorsal hair tinged with fuscous; head broad, facial quadrangle much broader than long; no yellow about head, cheeks entirely black; labrum, mandibles, malar region, broad anterior margin of clypeus, and a minute inconspicuous stripe on each side of face adjacent to eye and small spot at summit of eye, all ferruginous; antennæ entirely ferruginous, suffused with blackish above, except the third joint; upper border of prothorax, most of tubercles, and two large confluent spots on scutellum, yellow; the rest of the thorax is black; sides of metathoracic area with conspicuous grooves; legs black to about the middle of the femora (more behind), and beyond that red, the middle and hind tibiæ with a blackish streak behind, the knees inclined to be yellowish, the hind tibiæ with a yellow stripe on

outer edge, and the middle tibiae with faint indications of an apical yellow spot; abdomen very broad, black with yellow bands, that on first segment broadly interrupted, on second to fourth broad at sides, and narrowed or slightly interrupted in the middle, on fourth notched behind laterally; fifth segment yellow, with the base, and a round spot on each side, black; venter dark reddish, irregularly banded with lighter, and with a little yellow.

Milwaukee, Wisconsin, April 21, 1903. (Dr. S. Graenicher.) By the posterior notching of the fourth abdominal band, it resembles *N. vicina*, which is otherwise different. It differs from typical *N. sphaerogaster* (Proc. Phila. Acad., 1903, p. 611) by its ferruginous tegulae, and some slight details of the markings, but I feel assured that it is conspecific. If the difference should prove constant in a long series, it ought to have a distinct name.

NOTES ON THE LEPIDOPTERA OF THE YEAR 1904.

BY E. FIRMSTONE HEATH, CARTWRIGHT, MANITOBA.

The spring here was an unusually cold and late one, and it was not until April 17th that I saw a moth of any description, and that "first swallow" was only a *Depressaria Canadensis*, Busck. I did not see a single specimen of *Leucobrepbos Middendorfi*, Men., though an April seldom goes by without my doing so, and generally at some awkward moment when no net is handy. Year before last I was replotting some plants on the sunny side of my house, when a *Leucobrepbos* flew against me, dropped at my feet, and was off again before I could pot it.

It was not until April 28th that I noticed any Noctuids flying at sunset, and that night, and during two or three subsequent ones, I took a nice series of *Tæniocampas* at my sugared trees, chiefly *T. alia*, Guen., with a few *subterminata*, Smith, and one or two *pacifica*, Harv. There was also the usual sprinkling of hibernating species, among which the most notable capture was a *Scopelosoma devia*, Grote.

The weather then became cold again, and it was not till quite the end of May that moths were once more in evidence. Currant bloom—the wild black and the garden varieties—usually very productive, this year proved a blank. Throughout the summer all butterflies and moths were far less numerous than usual, and yet I made a few notable captures of species which I had not previously taken, or which are always rare. As their names will appear in Dr. Fletcher's "Record," I need not repeat them here.

There was hardly one evening on which light proved attractive, consequently I took very few Sphingidæ; even *Smerinthus geminatus*, which is often a perfect nuisance from its numbers, hardly appeared. Yet, if one may judge from the number of *Ampelophaga charilus*, Cram., that visited my sugared trees, the other species occurring here should have been on the wing in their usual numbers.

Later on, in June, the genus *Acronycta* came out rather strongly, and gave me a few nice things. The most abundant species of the year at sugar was *Noctua inopinatus*, Smith, and with them were a few rather larger and redder moths, which I conclude were *Noctua haruspica*, Grote. The two moths are so similar that it is very difficult to separate any number under their respective names. *N. inopinatus* replaced *Hadena devastatrix*, which, strange to say, was decidedly scarce.

I particularly noticed the absence of the genera *Leucania* and *Plusia*—by the latter name I mean the genus as it formerly stood, before it was split up into sundry subgenera. Even *Leucania unipuncta*, Haw., was a rarity. All Arctians were also scarce. *Cosmia paleacea*, Esper., and *punctirena*, Smith, came to sugar rather freely, and so did *Xanthia flavago*, Fabr., much more so than in any previous year.

The autumnal genera *Catocala*, *Xylina*, etc., were not nearly so abundantly represented as in the average of seasons, with the exception of *C. briseis*, Edw., of which I took a long series showing considerable variation; one or two having large white blotches on the primaries, which I believe is very unusual.

Those species of *Xylina* which were most abundant during the previous year were but poorly represented. I think on the whole that *X. tepida*, Grote, was the most plentiful.

The larva of *Sthenopis argenteo-maculatus*, Harris, seems to be a very general root-feeder. I have several times ploughed it out of the roots of scrub willows on the prairie, and during the second week of May I was having some black cherry and hazel scrub dug up, to enlarge my garden, when a full-fed larva was disturbed. I put it into a box, and it produced a moth, a female, during the second week of July. This species was also scarce; I only saw one other on the wing instead of the usual dozen or so.

As to Geometers, except for two or three species that come to sugar like Noctuids, I hardly saw any—they were not to be taken, though I particularly wanted several species. However, when I get all the names that are wanting in my collection, which I hope soon to do with the kind

aid of Rev. G. W. Taylor, of Vancouver Island, I shall have a small addition to make to the Manitoban list published by Mr. Hanham. All larvæ were scarce, even "cutworms" did little or no damage, and though I wanted to rear some *Malacosoma fragilis*, Stretch, I did not come across any of their "tents."

NEW SPECIES OF NORTH AMERICAN LEPIDOPTERA.

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

Cerathosia idella, n. sp.—Expanse, 25 mm.

Fore wings white, with small orange patch at apex, marked with black dots and bars as follows: Six spots on costa, about equidistant, the basal one slightly removed from costa and the second smaller than the others, a round spot in cell, followed by four short parallel transverse bars beyond it, lying close together, the third one joining spot on costa. A short longitudinal dash on inner margin at base, followed by five transverse bars from median vein to inner margin, the first, however, not quite reaching it. Of these the third and fifth are narrower than the others and in the male especially tend to become broken, probably in some specimens they would be almost or quite wanting. In the ♀ there is a sub-terminal row of spots, irregular in shape and size. In the ♂ these are reduced to three or four. On the outer margin there are some rather heavy black blotches. In the ♂ these show as quite well defined quadrate patches at inner angle, opposite cell and at apex. The fringe is black opposite these spots and between the lower two, but white between the apical and median ones. Hind wings orange, slightly darker outwardly. Head, collar and thorax white, with black spots on shoulders, centre of patagia and top of thorax. The thorax has, in addition, a posterior band. These markings show an admixture of metallic-blue scales under lens. Abdomen orange above, white beneath. Both wings orange beneath, with the black markings of upper surface more or less in evidence on fore wings. There is a short black bar from costa, at outer fourth, outwardly oblique, and the black markings of fringe are as on upper surface. Palpi black above and at tip, white beneath. Antennæ blackish. Tibiæ of fore legs black above. All tarsi checkered black and white as well as tibiæ of posterior and middle pairs.

Types ♂ and ♀. Pima Co., Arizona. July 20th.

Catabena begallo, n. sp.—♂. Expanse, 24 mm.

Dark blackish gray, with a slight reddish tinge, of about the same shade as *Egestis*. The ground colour is of the red shade, but in fresh

May, 1905.

specimens it is mostly concealed by a thick sprinkling of blackish scales. In worn specimens, much more of the ground colour is in evidence and there is a well-marked strigate appearance, especially outwardly. The orbicular is present as a minute, inconspicuous dot, with black centre. The reniform is to the naked eye the only contrasting feature in the maculation, and even it is not very prominent. It is of the ground colour with some white scales mixed, especially at lower end, and has a few black scales around it, but the margin is not at all well defined. With the lens a very faint dentate t. p. line can be made out. There is a faint interrupted black line at base of fringes, which are slightly checkered. The interruptions in the terminal line are due to faint whitish points.

Hind wings white, very slightly dusky outwardly and with fuscous line at base of fringe, which is white. In the female, while the fore wings are as in the ♂, the hind wings are more fuscous outwardly and there can be made out a very faint trace of mesial line. Head and thorax concolorous with fore wings, abdomen whitish in male, somewhat darker in ♀.

Fore wings beneath fuscous, lighter along inner margin. Hind wings with some fuscous scales along costa, faint discal dot. In the female the shades are somewhat darker.

Types, Southern Arizona, Pima Co.—This species can be readily distinguished by the pale contrasting reniform.

Platysenta temecula, n. s.—♂. Expanse, 26 mm.

Dark reddish-brown, with darker shades, veins darkened. A central shade extends from base along median nerve to or beyond end of cell. This is continued to margin, above inner angle, as a rather broad, though not strongly-contrasting, band. There is also a narrower shade running from end of cell to apex; the wing being a very little paler above and below it. There are two well-marked black intravenular dashes beyond cell. At end of cell is a short transverse white bar, preceded and followed by minute yellow points. The mark, while distinct, is small, and the detail only to be made out with lens. There is a row of black terminal lunules and the fringe is checkered, though not strongly so. Inconspicuous pale points on costa mark inception of the transverse lines, which are else barely to be made out, though indications of the t. p. can be faintly traced under the lens by pale points.

Hind wings fuscous, darker outwardly. Fringe paler, with dark line at base. Head and thorax concolorous with fore, abdomen with hind wings. Collar obscurely transversely banded.

Beneath fore wing fuscous, with slight reddish tinge; a distinct, though not prominent, mesial band not reaching inner margin; discal dot present. Hind wings whitish outwardly, reddish-fuscous along costa and outwardly, discal dot and mesial band as on fore wing.

Type, 1 ♂. Huachuca Mts., Arizona.

Tricholita baranca, n. sp.—♂. Expanse, 28 mm.

General colour seal-brown, with a slight reddish tinge, more or less frosted with pale scales. Head and thorax somewhat paler, showing less of the reddish tint, owing to a greater admixture of the pale hairs. Ordinary lines all tracable in perfect specimens, though not at all prominent. Under the lens the veins seem to be somewhat darkened and very sparsely coated with pale scales. Basal half-line evident, more noticeable from the pale filling than from the only very slightly darker limiting lines. T. a. almost transverse, irregularly dentate, slightly darker than ground colour, accompanied by slightly paler inner shade. Median shade rather more prominent than the other lines, outwardly oblique to lower end of reniform, thence inwardly oblique to middle of inner margin. T. p. scalloped, only slightly exerted, beyond cell, thence quite direct to inner margin. S. t. wavy, irregular, somewhat darker than ground colour. Median and terminal spaces slightly darker than remainder of wing. Costal and basal areas somewhat more frosted than remainder of wing. The inception of the transverse lines on costa are somewhat darkened, the pale filling showing as light dots. Towards apex there are three or four more pale bands, none of which, however, are strongly pronounced, but plainly visible under the lens. Fringe concolorous with terminal space, with faint darker basal line and pale dots at end of veins. Claviform obsolete and orbicular usually so, though in one specimen a faint minute brownish ring can be made out under the lens. Reniform margined by white points, usually four in the outer row and two or three in the inner, the outer row is much better developed and the second from the costa is evidently composed of the fusion of two others, as it is about twice as large and is in some specimens partly divided. Between the two rows of pale dots the spot is filled with reddish scales. The lower point of the inner row is the largest in all the specimens before me, those lying above it showing more or less of a tendency to become obsolete. Hind wings fuscous with more or less of a reddish mixture. Very faint traces of discal dot and mesial band, scarcely discernible except in certain lights. Fringe fuscous at base, whitish externally. Beneath fore wings paler than above, darkened centrally, paler along costa and inner margin. Traces of dark extra

mesial band and pale discal dot. Hind wings with distinct dark discal dot and mesial band. Thorax, legs and abdomen concolorous with wing.

Types ♂ and ♀. Kerrville, Texas. Received from Mr. Lacey.
Ipimorpha Nanaimo, n. sp.—Expanse, 33 mm.

Considerably paler than *pleonectusa*, with more of a yellowish tinge. The ordinary markings showing dark against the pale ground, while in the old species the reverse is the case. The t. a. line presents more of an inward and the t. p. line more of an outward curve, and the ordinary spots are much less clearly defined. The basal half-line not in evidence, while the s. t. is only marked by the contrast between the slightly darker sub-terminal space with the lighter terminal. The terminal space is somewhat shaded with black scales outwardly, while the fringe and the costa for a short distance from apex has a quite pronounced reddish tint. The orbicular has a slight pointed projection outward, corresponding to a similar inward projection of the reniform. The mesial band of hind is dark and followed by a slightly darker shade than the ground colour. Beneath there is a well-marked common mesial band. There is, however, no trace of the ordinary spots as in *pleonectusa*.

Type, 1 ♂. Victoria, B. C., from Mr. Hanham.

(To be continued.)

OBITUARY.

TERTIA SILVIA CRUICKSHANK, wife of Charles Stevenson, Secretary-Treasurer of the Mount Royal Entomological Club, Montreal, died on the 8th April, after a few days' illness. She was born in Scotland on the 26th December, 1866, and came to Canada in 1892, and was married on the day of her arrival, 31st May.

She was an enthusiastic naturalist from her childhood, and made pets of all kinds of animals. Soon after her marriage, her husband took up his school-boy hobby of collecting insects, in which she joined him. In the summer months she spent what time she could spare from her domestic duties in entomological work and was a very successful collector.

She has left two children, Kenneth Ruttan, aged 11, and Ivy Silvia, aged 8, both of whom show promise of becoming entomologists.

The Montreal Branch of the Entomological Society of Ontario and the Mount Royal Entomological Club were well represented at her funeral. The former showed their sympathy by a wreath and the latter by a floral anchor. All the members of the Society unite in very deep sympathy with Mr. Stevenson and his children in their sad bereavement.

Mailed May 5th 1905.