

IGNOTUS AENIGMATICUS—ADULT MALE.

The Canadian Entomologist.

VOL. XI.

LONDON, JULY, 1908.

No. 7.

A BIT OF CONTEMPORARY HISTORY.

BY ANNIE TRUMBULL SLOSSON, NEW YORK.

In the CANADIAN ENTOMOLOGIST, Vol. XXXV, p. 183, in a paper entitled "A Coleopterous Conundrum," I told of my discovery of an anomalous beetle occurring as a seeming museum pest in my New York collections. In this article I quoted freely the expressed opinions of several well-known coleopterists as to the position and affinities of the singular little insect. My paper, though it contained nothing which was not strictly true, was, unfortunately, written in a somewhat flippant, would-be humorous style, its colloquial diction and tone of levity—if not absolute irreverence—being quite out of place in a scientific periodical. This, as I should have known from sad experience, was a grave error. No conscientious naturalist should possess, or recognize in others the possession of, a sense of humour. As might have been anticipated, painful results followed my blunder. In writing the sketch referred to, I had not dreamed of making a scientific description of the odd coleopter, or of giving a generic or specific name. But I carelessly introduced the following sentence: "Shall I ever find other specimens of what I have sometimes, in chat over my discovery, styled *Ignotus ænigmaticus?*" I wrote the absurd name with a smile, which I somehow fancied would be caught and interpreted aright, even by far-away readers of my humble paper. Eheu! Alas! Alack! How little I realized what I was doing. I was not long in ignorance. For I very soon learned that, all unwittingly, I had, at least in the opinion of some of our most distinguished and learned entomologists, created a genus and species, and I had given to them names which, however ridiculous and inappropriate, must henceforth and forever cling to these dainty little creatures, these curios among coleoptera and perhaps be linked, too, with my own unworthy name. My protests, my plea that I "didn't go to do it," were all in vain. The innocent beetle was referred to constantly by the unfortunate title used so idly, so

lightly at first; its counterfeit presentment appeared each month for a whole year on the cover of an entomological journal thus labelled, and I began to realize, as never before, the irrevocableness of things. I sought advice, and received much and diverse counsel. But the consensus of opinion seemed to be that, as the beetle was now so well known by the name I had unconsciously given, it had best retain it, and that a proper description with figures should be at once published.

I asked my friend, Mr. Frederick Blanchard, to prepare such a description, and he kindly consented to do this. But he courteously insisted upon my name remaining as authority for the specific, if not the generic, title. My first discovery was made in May, 1902. For two years after this I examined my insect boxes at intervals, but found no trace of the little pests. But in May, 1904, I again found them in the same closet where they occurred previously. This time I found with them one specimen of the larviform female and several larvæ. Mr. Joutel, our well-known, careful and skilled artist, made drawings of the beetle in its different stages. Mr. Blanchard for many reasons has been unable until recently to complete the promised diagnosis. I give herewith a description of the species, owning frankly that I could not have written it without much assistance from Mr. Blanchard. Let me add that since I first found *Ignotus* it has been recognized as a pest among the collections of the Public Museum of Milwaukee, as told me by Mr. C. T. Brues. In this case the beetle was found among land shells and other specimens "practically from all parts of the world." Of what country the mysterious unknown is a native we do not know. Perhaps the following description and Mr. Joutel's excellent drawings may assist us to solve the problem. Then, when we learn what euphonious name the unknown enigma bears in some far-away land, and its lately-given title vanishes into that bourne from which no synonym returns, nobody will regret less than its unfortunate sponsor to see it

"Suffer a sea change
Into something rich and strange."

THE CHARACTERS OF *IGNOTUS* (PLATES 6 AND 7).

Head suborbicular, constricted far behind the eyes, deflexed and much narrowed in front, the labrum short, transverse, and with the very small mouth a little reflexed, the frontal suture not obvious. The oral organs

are minute and apparently somewhat atrophied, especially in the female, but they have not been so successfully examined as to be clearly understood. The mandibles are minute and rudimentary, and too widely separated to have any function. In the male the maxillary palpi are very small and slender, with a short basal joint, the second longer than wide, the third narrow, not longer than wide, fourth equal to the third in length, subulate. Mentum short and narrow, transverse, arcuate in front, ligula narrower, twice as long as the mentum, palpi apparently of two subequal joints, together not longer than the terminal one of the maxillary palpi. These organs are smaller in the female and still more difficult to verify. The gular sutures are obscure, but sometimes obsoletely indicated in the female when they are approximate in front and diverging behind. The eyes are large, prominent and rather coarsely granulated in the male, quite small in the female, and of few facets somewhat irregularly disposed. An ocellus, smaller in the female, is present between the eyes, within the apex of two converging grooves which arise at the bases of the rather prominent antennal supports. The antennæ are ten-jointed, basal moderate, second shorter, three to six very small and closely articulated, seven to ten very elongate; in the female the antennæ, although of similarly proportioned joints, are very much smaller and shorter.

The pronotum is somewhat trapezoidal, broader in the female, the sides not margined, but inflexed to the subobsolete prosternal sutures, the pubescence of the inflexed portion similar to that of the upper surface, and contrasting with the very sparsely pubescent prosternum. The prosternum is convex and moderately long before the coxæ, not at all separating them in the male, the coxal cavities confluent, and in both sexes broadly open behind. In the female the prosternum is a little shorter before the coxæ; broadly produced and truncate behind between the widely-separated coxæ, its entire length about one-half that of the pronotum.

Mesosternum of the male transverse, slightly sinuate in front, lobed behind and loosely articulated with the metasternum, between the coxæ, sides oblique, the lateral pieces small triangular and subequal, the epimera alone reaching the coxæ.

Metasternum of the male transverse, a little longer than the second and third segments of the abdomen; episterna broad anteriorly, gradually narrowed behind; epimera not observed.

In the female these two segments are more rudimentary or larva-like, the mesosternum being simply transverse without intercoxal development, the coxæ at extreme lateral margin, parapleura obscure. The metasternum is shorter and broader than in the male, in dried specimens with the inflexed hind margin emarginate between the widely separated coxæ, the episterna moderately wide and scarcely narrower behind.

Scutellum small, triangular in the male; in the female the mesonotum is short and distinctly narrower than the other segments; the metanotum again longer, although shorter than the pronotum, and somewhat wider than the mesonotum.

Elytra of male without epipleura.

Coxæ conical and prominent, loosely articulated and mobile, the anterior pair contiguous in the male, the middle and hind pair well separated, the latter a little more widely. In the female, while the body is broader, the coxæ are much smaller, and reaching the same lateral limits become more widely separated.

Middle and hind legs in the male two-thirds as long as the body, the anterior ones shorter; trochanters slender, longer than wide, the femora attached distally; tibiæ a little longer than the femora and without spurs; tarsi slender, a little shorter than the tibiæ, five-jointed, first joint as long as the next two, second, third and fourth gradually shorter, fifth elongate, with small simple claws. In the female the legs are very small and weak, not longer than the width of the body.

Abdomen with seven free subequal dorsal and ventral segments in the male and eight in the female.

The eggs are elliptical, twice as long as wide, translucent, shining, slightly iridescent and minutely longitudinally striate. Length, 5 mm.

The larva is somewhat contractile, elliptical, twice as long as wide, obtusely rounded at each extremity, abdomen a little wider, the dorsal segments corneous, shining, brown, densely fringed with spinose bristles and fine hairs; beneath with soft membranous integuments, and finely sparsely hairy.

Head small, less than half the width of the prothoracic segment, reddish-brown, rather thickly clothed with short coarse hairs, prostrate in front, sparser on the vertex, and more erect behind, and with a few spinose bristles. Epistoma very short and transverse, the separation from the

front rather deeply impressed, labrum short and transverse; mandibles short, blunt, piceous; antennæ minute, a basal very short joint scarcely as long as wide supporting a second of the same thickness, twice as long as wide; in the final moult, apparently of one or two very short joints bearing a terminal short tuft or pencil of fine closely-placed hairs. Behind and a little outside the antennæ are three ocelli in a triangle. (Fig. 10.)

The pronotum is longer than any of the following segments, the anterior outline somewhat semicircular, without any anterior angles,



FIG. 10.—*Ignotus anigmaticus*, larva: *a*, ocelli; *b*, antenna; *c*, a long hair.

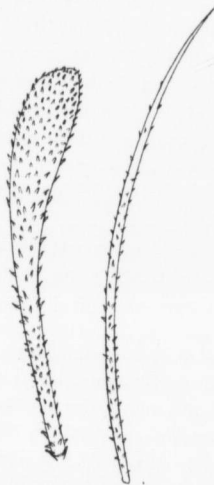


FIG. 11.—Larval hairs.



FIG. 12.—Middle leg of male larva.

meeting the broadly arcuate basal margin in an indefinite obtusely rounded angle. The following thoracic and abdominal segments subequal, short and strongly transverse, the ninth shorter and narrower. The vestiture is composed of hairs and bristles of three kinds; the hairs are simple, long and fine, the bristles are taper-pointed or clavate, and sometimes abruptly acuminate, and throughout thickly hispid with minute black points or spines. (Figs. 10, 11.)

The median dorsal surface of the segments, from side to side, is sparsely, finely pubescent with simple hairs, the anterior margin and a posterior interval glabrous. The anterior margin of the pronotum extending forward, and the posterior margins of the eighth and ninth dorsals of the abdomen extending backward, are densely fringed with tapering bristles; the posterior margins of the thoracic and abdominal dorsals, except the last two, are similarly fringed with subdepressed clavate bristles of equal length, of which seventy to eighty have been counted on a segment; behind and mostly hidden under the clavate bristles is a series of fine simple hairs bordering the hind margins of the segments. The anterior fringe of the pronotum affords protection to the junction of the head, while the fringes of clavate bristles and subordinate hairs effectively defend the membranous connection of the segments from dust or minor enemies. At the narrowed lateral extremities of the second and third thoracic and the first to second abdominal dorsal plates are spreading tufts of tapering bristles.

The spiracles are exceedingly minute and difficult of observation, the thoracic pair, as usual, before and outside the middle coxæ, the abdominal at the sides, below and slightly anterior to the lateral extremities of the dorsal plates.

Coxæ, femora and tibiæ subequal in length, the coxæ narrowing from base, the femora a little thicker outwardly, the tibiæ slender and tapering to apex and terminated with a slender claw, which, as well as the trochanter, is about one-third as long as the other joints of the leg.

The pupation of the female only has been observed. This takes place within the larval skin just as in *Anthrenus*. A middorsal rupture of the skin frees the imago, leaving the delicate pellicle of the pupal envelope within the larval moult.

Both sexes of *Ignotus* are apterous, and the female is without elytra. The male has long slender antennæ and legs, which are very much shorter and weaker in the female. The surface is sparsely obsoletely punctate. In the male the first two dorsal segments of the abdomen are paler and membranous, the following semicorneous or coriaceous and piceous; ventral sutures straight, first ventral membranous and more or less concealed at the middle, visible and of firmer texture at the sides; second

segment with a lobe-like pubescent tumidity at middle of hind margin; sixth segment slightly sinuate behind, seventh subtruncate or broadly rounded. In the female the first three dorsals are shorter, scarcely longer than the mesonotum, the fourth to eighth longer and subequal, the ventrals subequal, the first two more membranous, the eighth narrower and rounded behind.

Much attention has been given to the relations of *Ignotus* with other Coleoptera, and it is hoped later to offer some of the considerations bearing on the subject. The structure and habits of the larva make it almost impossible to resist the conviction that it is Dermestide, but the loose-jointed imago with its long slender legs and antennæ in the male seem very far from the compact Dermestide type, the only immediately obvious character suggesting affinity consisting in the presence of an ocellus. This is so rare among Coleoptera as to be very suggestive.

Ignotus ænigmaticus, n. sp.

Male.—Elongate, a little wider behind, testaceous, the head, prothorax, metasternum and sometimes the tips of the elytra somewhat darker; abdomen more or less piceous; thinly clothed with pale prostrate hairs, somewhat condensed on the basal two joints of the antennæ, whole surface coriaceous and feebly shining. Head narrowed arcuately behind, and slightly constricted at its insertion with the prothorax, the latter wider than long, much narrowed anteriorly, sides arcuate to base, where they are minutely inflexed, with blunt right angles, the anterior ones rounded, truncate before and behind; sides of the pronotum narrowly inflexed, with a faintly indicated demarcation between them and the flanks; upper surface feebly convex, more or less impressed each side, base indistinctly margined. Elytra shorter than abdomen by one or two segments separately rounded at tips and somewhat dehiscent. Length, 2-3 mm.

Female.—Wingless, larviform. Elongate, narrowed towards each extremity, testaceous, thinly dotted with paler hairs, which are a little longer and more bristling along the middle of the sides; surface somewhat coriaceous, feebly shining. The prothorax more transverse than in the male, and more evenly convex, with no trace of basal margin. Abdomen with subequal segments, the last one broadly rounded behind dorsally and ventrally. Length, 2.7 mm.

PAMPHILA MANITQBOIDES, FLETCHER, AND PAMPHILA,
SASSACUS, SCUDDER.

BY HENRY SKINNER, PHILADELPHIA.

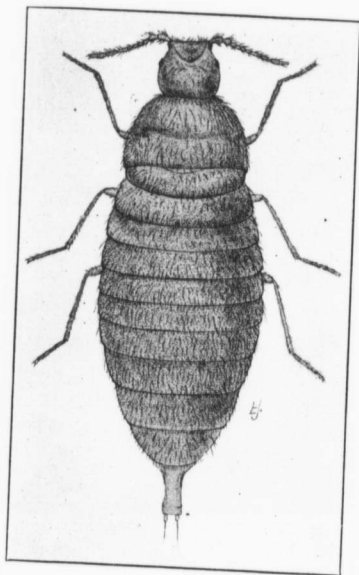
Since our visit to Nepigon last July, Dr. Fletcher and I have been greatly interested in these two insects. The amount of material in *Manitoboides* has been limited until this recent trip. Last year we captured a few specimens at Nepigon, and Dr. Fletcher has sent me four males and six females. I had in addition five males and eight females. I have compared these specimens with a series of *sassacus* from Pennsylvania, New Jersey, New York and New Hampshire, and have arrived at the conclusion that *Manitoboides* is a geographical race, topomorph or subspecies of *sassacus*. There is a very great difference between the two when extremes are selected, but the intergrades show their relationship. In the male (*Manitoboides*) the limbate area of secondaries above is greatly restricted as compared with *sassacus*. The under side of secondaries in *sassacus* is immaculate in some specimens, and the contrast between these and the heavily-spotted under side of *Manitoboides* is very striking. The differences mentioned are gradational through a series. The stigma, antennæ, etc., are identical. The Nepigon specimens show considerable variation among themselves. According to evolution these are the things we expect to find. If future studies and study of the life-histories prove my conclusions erroneous, I at least think it well to call attention to their very near relationship at this time.

It is gratifying to learn that both Houses of the United States Congress have concurred by a unanimous vote in granting an annuity for life of \$1,500 each to the widows of the late Major James Carroll, Surgeon in the U. S. Army, and the late acting Assistant Surgeon, Jesse W. Lasear, whose lives were sacrificed to duty in the study of the transmission of yellow fever in Cuba by the mosquito *Stegomyia fasciata*

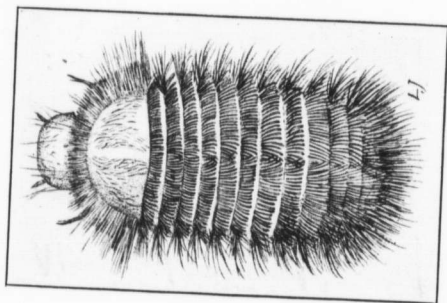
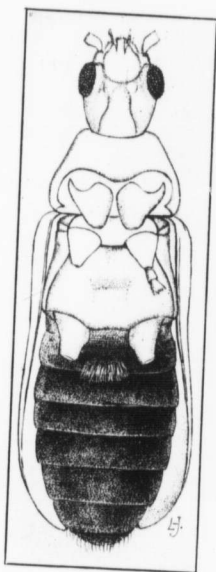
A SYNOPSIS OF THE GENUS PEMPHIGUS, with notes on their economic importance, life-history and geographical distribution, by C. F. Jackson, Ohio State University.

This very important and extremely useful paper has just been received. The author deals with the characterization, history of the formation, general anatomy, habits, life-history and derivation of the genus, and gives a key to the genera of the family Aphididæ, with an appended key to the species of the genus Pemphigus and a synopsis of the species, with notes on their economic importance.—[T. D. JARVIS.

A



B



C

IGNOTUS AENIGMATICUS.—A, ADULT FEMALE; B, UNDER SIDE OF MALE (HAIRS OMITTED); C, LARVA.

NOTES ON THE SPECIES OF RHYNCHAGROTIS, SM., WITH DESCRIPTIONS OF NEW SPECIES.

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

The genus *Rhynchagrotis*, Smith, is restricted by Hampson to the yellow-winged species allied to *gilvipennis*, Grt., the latter being declared generic type because it happened to stand first in the series, even though it contradicted the generic description in part and was placed in the genus with an expressed doubt as to the correctness of the association. A more absurd consequence of rigid adherence to an arbitrary rule can scarcely be conceived, and I decline to accept this limitation of my genus. The bulk of the American species which I placed in *Rhynchagrotis*, Hampson places in *Triphena*, Hbn., and if that is correct, then my genus is a synonym—a conclusion to which I could take no possible exception. I do not believe, however, that the yellow winged *Triphena* of Europe are congeneric with the American species that I have called *Rhynchagrotis*, and therefore retain the name in the sense in which I originally used it. If *gilvipennis* is generically distinct it should have a new generic name. For present convenience, however, I retain the species here, again emphasizing the fact that it differs obviously not only in colour, but in minor structures from the rest of our species.

The present rearrangement of my material was induced partly because my boxes were becoming overcrowded, partly because I had received a large number of specimens in some groups showing great range of variation, partly because I had material which could not be satisfactorily referred, and partly because I wished to bring my collection into accord with Sir George F. Hampson's general conclusions.

I secured by purchase, from Mr. George Franck, a large lot of Colorado material; Mr. Otto Buchholz, of Newark, who collected in Yavapai County, Arizona, in 1907, was good enough to loan me all his examples—some 200 or more, and Mr. J. W. Cockle, of Kaslo, B. C., sent me a nice lot, representing the species found in his locality. Other material was obtained in smaller amounts from other correspondents, so that I believe myself justified in the conclusions reached in this revision.

The basis of separation after eliminating the yellow-winged *gilvipennis* is, first of all, the dark brown head and collar which distinguish *rufispectus* and *brunneicollis*.

Next comes *minimalis*, which is unique in having single median lines where all the others have them geminate.

Bimarginalis and *vittifrons* stand together by having the costal region of primaries from base to the t. p. line pale, discoloured; an even streak which does not invade the cell or the ordinary spots.

Next comes a longer series of species, in which the orbicular is open to the costa and is more or less distinctly V shaped. The costal region may or may not be paler than the ground colour, and there may or may not be a black filling in the cell around the spots; the open orbicular distinguishes *formalis*, *costata*, *confusa*, *crenulata*, *exsertistigma*, *latula*, *discoidalis*, *niger*, *emarginata* and *meta*. In addition to the character of maculation all these species have the thoracic crest distinctly marked, and furrowed or divided centrally.

This latter feature is also shared by *mirabilis*, which has contrasting discoloured ordinary spots, and *inelegans*, which has not much maculation of any kind.

All the rest of the species are more depressed or flattened, without obvious thoracic tufting, and the orbicular is always completely defined, never open to the costa.

Placida differs from all of those in this series by having an obvious median shade line.

Scopeops and *variata* have a bluish underlay, which appears throughout the wing and gives them a characteristic mottled appearance.

Then comes a series of species with somewhat elongate, subparallel wings, with rounded or stumpy outer margins. They are all variable, and it is difficult to divide them on exclusive characters. I include *nefascia*, *duanca*, *alternata*, *alcandola*, *Belfragei*, *anchocelioides*, *brunneipennis* and *cupidissima*.

Last of all come *trigona* and *sambo*, two species with shorter, broader, triangular wings, in which the apices are well marked and the outer margins are oblique.

Rhynchagrotis gilvipennis, Grt.

Our only species representing the yellow-winged forms of the old world. It occurs throughout the Northern United States and Canada, extending west to Calgary and into British Columbia, but not reaching the Pacific Coast. It extends northward to Anticosti and into Labrador and probably throughout the boreal region. It is a close ally of the European and Asiatic *chardynii*, Bdv., and was at one time supposed to be the same. There is not much variation in the numerous specimens I have seen.

Rhynchagrotis rufipectus, Morr.

This species extends across the continent through the more northern parts of the country, but does not seem to extend southward in the Atlantic Coast region nor in the Mississippi Valley. It does, however, extend southward on the Pacific Coast, and is recorded from Los Angeles Co., in Southern California. In general the species is easily recognized, and does not vary much in any one region. There is, however, a very decided difference between the small dark gray specimens of the New England States and the large reddish-gray examples that I have from Sierra Nevada. With examples of the extremes only at hand, two species would be readily accepted. Fortunately, in the series of examples from Kaslo, both forms were found, taken apparently on the same dates. The gradation comes in the form of a reddish powdering over the dark lustrous gray of the typical form. As this intensifies, the gray seems to disappear, until only the reddish overlay remains, conveying the impression of a more thinly-scaled wing.

Rufipectus and *brunneicollis* are distinguished from all our other species in having the head and collar velvety-brown.

Rhynchagrotis brunneicollis, Grt.

Has about the same general distribution in the Eastern United States as the preceding, but seems to extend further southward along the Atlantic Coast, and does not extend westward through Canada into British Columbia, nor have I seen it from the Pacific Coast at any time. It is larger than *rufipectus*, reddish and brown instead of gray, and the transverse lines are geminate instead of single.

Rhynchagrotis minimalis, Grt.

This species is rarely represented in collections, and specimens so named are, as a rule, incorrectly determined. It differs from practically all of the subsequent species by the single, instead of geminate median lines, and in that character is not unlike *rufipectus*, which it does not resemble in any other way. I have seen it only from Maine, Colorado and British Columbia, and always in isolated specimens. In colour it resembles *anchocelioides*, and it may be mistaken for a disreputable form of that species.

Rhynchagrotis bimarginalis, Grt.

Not in my collection and apparently very rare. Has been taken only in New Mexico, and is easily recognizable by the pale yellow costa and more bluish terminal space; it is quite characteristic, and its only ally is the next species.

Rhynchagrotis vittifrons, Grt.

All my specimens are from Stockton, Utah, September and October, or Fort Wingate, New Mexico, in September. The species is lustrous smoky-blackish, without obvious maculation, but with collar and costal margin from base to t. p. line broadly pale yellow. It differs from the preceding in that the terminal space is concolorous with the main body of the wing. The species is also recorded from Glenwood Springs, Colo.

Rhynchagrotis formalis, Grt.

This is an extremely interesting form from the Pacific Coast, extending from Southern California to Vancouver, and it needs a long series to appreciate its variations. In ground colour it ranges from red to deep chocolate brown, more or less powdered or washed with bluish, the costal area paler and with the bluish more conspicuous, invading the open V-shaped orbicular. The transverse maculation is largely lost and the terminal area is usually bluish, or at least a little paler. In the normal form there is a black streak at base below the median vein, and the cell before and between the ordinary spots is black. This is the *facula* of Grote, according to Hampson, and it varies in the direction of losing the black filling of the cell. In the type of *formalis* the black basal streak is lost, and this varies in the direction of losing the black filling in the cell, and finally the black tip to the collar. This seems to make it a difficult species to recognize, and so it is from limited material; but these uniform examples are in the minority, and, in almost every instance, there is a darkening of the ground that locates the usual black markings. All the examples before me, 15 in number, are from California, and illustrate the extreme range of variation above given.

Rhynchagrotis costata, Grt.

This is not represented in the material before me. I have a coloured figure made from the type many years ago, and that is very like Hampson's published figure. The species is pale red-brown in colour, the costa broadly paler, not crossed by the median lines, orbicular broadly V-shaped. The t. a. line is obscure, and the basal streak seems to merge gradually into the black filling of cell.

Rhynchagrotis confusa, Sm.

Resembles *costata* in a general way, but the transverse lines are much better marked and, at base, the black streak usually curves downward when it reaches the t. a. line, so as to form its inner defining element.

In the material before me is a nice series of 8 ♂'s and 7 ♀'s from Mr. J. W. Cockle, taken at Kaslo, B. C., July to September, and they indicate a very pretty range of variation, similar in scope to that in *formalis*. The collar may or may not be black-tipped, a distinctly black tip being rare, and the black filling of cell and basal streak may be totally absent. In the latter case there is usually an intensification of the red-brown that brings out the pattern almost as well as the black.

Other localities represented in the material are Pullman, Washington; Corfield, Vancouver; Stockton, Utah; Monterey, California.

Rhynchagrotis crenulata, Sm.

This is a darker, more purplish-brown species, in which the costal region is not contrastingly paler, and is crossed or marked by the median lines. The collar is not noticeably black-tipped, but is inferiorly paler, or is crossed by a pale transverse line, which may be black edged. All the examples before me are from Pullman, Washington; Stockton, Utah, or Placer Co., California, and those that are dated are in July.

Rhynchagrotis exertistigma, Morr.

A dull luteous-brown, sordid looking species with black-tipped collar. The costa is of the palest wing colour, but not contrasting, and the pale costal coloration does not fill the orbicular. That spot is V-shaped and open to the costa; but while its defining line is pale, the core of the spot is of the darker colour of the wing, giving the insect a very characteristic appearance as compared with its allies. As in the other species, the amount of black varies, but in this form a completely black-filled cell is the exception, while the uniform colour, free from contrasts, is the rule. My examples are from California, Washington and Oregon.

Rhynchagrotis latula, Grt.

This is an ally of the preceding, even more sordid-luteous in colour, mottled with fuscous, and with the orbicular tending to close superiorly. I have only a single defective example from Corvallis, Oregon. It is also recorded from Washington and California.

Rhynchagrotis discoidalis, Grt.

Dull gray-brown in colour, mottled with smoky, the s. t. space darker than the other parts of the wing, cell blackish between the ordinary spots, orbicular round or oval rather than V-shaped, but incomplete superiorly and open to the costal colouring. I have it from various points in California, Stockton, Utah, and Fort Wingate, New Mexico. Dates are in

July and September. The species is one of the most characteristic of the series and easily recognized.

Rhynchagrotis niger, Sm.

Uniform, very dark smoky-brown, collar without lines or marks, transverse maculation of primaries almost lost, the ordinary spots marked only by the black filling in the cell; orbicular open to the costa. The species is very characteristic, but I have only the types—one from Pullman, Washington, the other from Moscow, Idaho, the former in May, the latter in July.

Rhynchagrotis emarginata, Grt.

I have 2 ♂'s and 1 ♀ that I have separated from *formalis*, and which agree with a figure made from the type of *emarginata*. There are specimens of *formalis* so close to this at first sight that I failed to discriminate between them in 1892, and Sir George F. Hampson has, more recently, fallen into the same error. *Emarginata* differs from the most evenly-coloured *formalis* in having the transverse lines marked on costa by geminate black dots, the costal area is not in the least paler, and there is no difference in tint between the base and upper portion of collar. In all these points my specimens and the drawing agree, and I have therefore restored Mr. Grote's name as referring to a good species.

Rhynchagrotis meta, Sm.

Of this neat little species I have only the two typical examples. It is very pale fawn-gray, washed with reddish, the median lines darker brown or even blackish. The costal area, while not paler, is of the palest gray on the wing, and the ordinary spots are defined by the reddish washing around them. The orbicular is V-shaped, open to the costa and like it in tint. The extreme tip of the collar is black, else the head and thorax are a rather rusty-red.

Rhynchagrotis mirabilis, Grt.

Easily known by the discoloured yellowish reniform and the black streak through cell and below median vein—a somewhat variable feature, by the bye. The disc of thorax is also more or less discoloured, as a rule, with lateral black lines to the discoloured area.

Rhynchagrotis variata, Grt.

Begins the series in which the ordinary spots are small, not discoloured; the orbicular round, or nearly so, and always complete, not open to the costa. The present species is perhaps the largest and

broadest-winged of the series, with a base of lilac-bluish, over which is the prevailing wing colour, which ranges from a pale luteous to bronze-red in one direction and smoky-gray in the other. The terminal space is always pale, usually of the bluish base, and the broken median lines are usually accompanied by the same bluish shading, which gives the appearance of light, undefined bands across the wings. The characteristic appearance so imparted holds in all the variations of colour and makes the species almost unmistakable.

The series of 16 ♂'s and 11 ♀'s before me shows a beautiful range in coloration; the localities extending from Kaslo, British Columbia, on the north, to the Chiricahua Mts., Arizona, on the south, and from Glenwood Springs, Colorado, on the east, to the Sierra Nevada, California, on the west. The palest specimens are from California, the darkest from British Columbia. Dates are from June to August in the northern part of its range, and from July to October in Arizona.

Rhynchagrotis scopeops, Dyar.

A very characteristic form, similar in many respects to *variata*, but much smaller, narrower-winged and the unusually large ordinary spots annulate with the pale or bluish underlay. The wings have a mottled appearance, especially along the costa and basal area, which separates it from *placida*. Kaslo, B. C., is the type locality, and from it Mr. Cockle has sent me a few examples for examination. I have a single male from Newfoundland that I cannot separate, and which at present I believe to be the same species.

Rhynchagrotis placida, Grt.

This specific name has served as a blanket for all the smaller narrow-winged forms in which the terminal space is paler than the rest of the wing and the colours range from red-brown to mouse-gray, the grays predominating. There are really two forms concerned, the type *placida* with an obvious median shade line in both sexes, the other without this character. There are other differences in detail, but this is the most easily noted superficial feature. The range of *placida* extends through the northern United States and Canada from the Atlantic to the Pacific. I do not have it from any southern locality at present.

Rhynchagrotis negascia, n. sp.

Similar to *placida* in size and general appearance, but with less trigonate and more stumpy primaries. The absence of a distinct median shade has been already noted, and, in addition, the ordinary spots are

smaller, the reniform especially tending to become narrow, oblong, with the angles rounded rather than kidney-shaped. The secondaries in both sexes are very evenly blackish, whereas in *placida* they are decidedly paler at the base, and in no case evenly blackish. The primaries have the appearance of being more densely scalded, and while finely powdered appear more even in general tint.

There is a large series of both sexes before me from Ft. Wingate, New Mexico, and another, collected by Mr. Buchholz from Yavapai Co., Arizona. Altogether of spread material there are 35 ♂'s and 47 ♀'s showing a remarkable uniformity in general characteristics, while yet the terminal space is contrastingly blue in some examples, nearly concolorous in others, and the predominating shade may range from creamy-luteous to brick-red in one direction and smoky or gray-brown in the other. The ordinary spots are usually a little darker and outlined by rather broad annuli of the ground colour.

Rhynchagrotis inelegans, Sm.

An extremely obscure species which is not really well located here, because it has a more obviously divided thoracic crest than the neighbouring forms. But the ordinary spots are complete, and all the maculation beyond the geminate basal and t. a. line is obscure. In the type the colour at base and extending along costal area is red-brown, darkening very gradually. In an example from Kaslo, which I take to be the same, the entire wing is very dark, almost blackish, and all the maculation is gone. More material is needed to fix the best place for this species.

Rhynchagrotis duanca, n. sp.

Blackish-smoky; head and collar faded, more yellowish, secondaries with a brownish shade. Primaries with all the transverse maculation lost or barely traceable; ordinary spots small, traceable by slightly paler annuli.

Expands.—1.22-1.36 inches = 30-34 mm.

Habitat.—Stockton, Utah, IX, X; California.

Two ♂'s and 3 ♀'s in rather unsatisfactory condition, but obviously different from anything else in this series. It is narrower-winged than *nefascia*, and with the maculation almost all lost. I have a pair of specimens from Montana which are probably the same, but there is enough question about it to prevent my placing them in the type series.

(To be continued.)

NEW SPECIES OF NORTH AMERICAN HYDROCERA
(COLEOPTERA).

BY A. B. WOLCOTT, INDIANAPOLIS, IND.

The author has had in preparation a monograph of the genus *Hydrocera*, it being now evident that the results can not be published for some little time, and specimens having been sent out bearing MS. names, it is thought advisable to make known some of the most conspicuous forms among the new species.

Hydrocera cæruleipennis, n. sp.—General form of *pallipennis*, but more elongate and shining. Dark bluish-green, elytra bright blue-green; antennæ, palpi, all the tibiæ and front and middle tarsi pale testaceous, the two basal joints and club of antennæ, apices of palpi, labrum and posterior tarsi piceous, the front and middle tarsi slightly infusate, all the green parts with metallic lustre. Antennæ short, moderately slender, mass acuminate at apex. Head with the large prominent eyes much wider than the thorax, very finely and densely rugulose, front densely clothed with short silvery white recumbent and long erect grayish hairs, a conspicuous bunch of long erect grayish hairs below the eyes. Thorax as long as broad, apical constriction strong, sides before the middle rather strongly dilatated, sides posteriorly nearly straight, strongly convergent, apical and basal transverse impressions strong, disc coarsely, densely but not very deeply punctate, slightly rugulose at sides, lateral foveæ large, deep, pubescence rather sparse, long, erect, gray. Scutellum densely clothed with semirecumbent grayish pubescence. Elytra covering the abdomen, scarcely wider at base than the head, twice as long as wide at base, humeri moderately prominent, sides straight, moderately narrowing to apex, apices separately rounded and dehiscent at suture, sides behind the middle and apices strongly serrate, pubescence rather sparse, gray, erect and semierect at base, becoming shorter, more dense and erect and recumbent toward the apices, very coarsely, deeply and slightly confluent punctate, punctures not smaller at apex and but slightly more confluent. Legs long, slender, posterior femora not nearly attaining the apex of elytra, clothed with long erect cinereous hairs. Meso- and metasternum densely clothed with short silvery white recumbent pubescence; abdomen more sparsely, with longer white hairs. Length, 3.75 mm.

Santa Rita Mts., Arizona, 5,000–8,000 feet. July. F. H. SNOW.

This beautiful species is very distinct from all the known species of our fauna, the form of the prothorax agreeing very nearly with *pallipennis*

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and *affiliata*, while the elytra are much longer than in those species, and more coarsely punctured than in any other species with elytra attenuate. The elytra are feebly depressed at apical one-third, the apices being not perceptibly tumid, the depressed third of elytra is in certain lights of a brilliant cobalt-blue tinge.

Hydnocera fallax, n. sp.—Robust, not strongly convex, black, with greenish reflexions, feebly shining, elytra blue-black, a narrow longitudinal maculation at base midway between the scutellum and the humeri extending more than one-third the length of elytra, antennæ, anterior and middle legs and basal half of hind femora yellowish-testaceous, front tibiæ with outer margin piceous, hind tibiæ obscurely testaceous on outer margin, apical half of middle femora and tibiæ slightly infuscate. Pubescence rather sparse, moderately long, grayish and semierect, most conspicuous on head, thorax and posterior half of elytra. Head with large prominent eyes, one-fourth wider than thorax, front feebly and vaguely impressed, densely, finely rugosely punctate. Thorax equally as broad as long, apical constriction strong, sides moderately dilated, behind the dilatation strongly compressed, sides thence to base slightly divergent, apical transverse impressed line obsolete, subbasal impressed line short, ending each side in a feeble fovea, basal margin reflexed, lateral foveæ obsolete, densely, finely rugosely punctate, middle of disk rather more sparsely. Elytra slightly shorter than the abdomen, sides nearly straight, convergent from base to apices, apices obliquely rounded, narrowly dehiscent at suture, sides behind the middle and apices strongly serrate, punctuation moderately coarse, rather sparse and mostly well separated except at apical third, where they become dense and slightly rugulose, colour blue-black, each with a narrow yellowish-testaceous longitudinal stripe broader posteriorly, extending from the base midway between the humeri and the scutellum to basal third. inner margin of stripe parallel with suture, posteriorly dilated to twice the width at base. Length, 3.5 mm.

Colorado Springs, Colorado, 6,000–7,000 feet. H. F. Wickham.

This species might at first sight readily be taken for *humeralis*. It is, however, quite distinct, the thorax being longer, the elytral flanks strongly convergent toward the apices, and the form is more robust, finally the colour markings are of a different type.

The posterior femora extend slightly beyond the apex of elytra, but are shorter than the abdomen; the legs are sparsely clothed with long hairs.

Hydnocera Wickhami, n. sp.—Large, robust, moderately depressed, black, slightly bronzed, above subopaque, body beneath and abdomen moderately shining, head and thorax with greenish reflections. Head scarcely wider than the thorax, eyes large, ciliate, with long dark hairs, moderately prominent, labrum and labial palpi black, antennæ and maxillary palpi (except apical joint of latter) pale testaceous, antennæ moderately slender, extending nearly to middle of thorax, mass obtuse at apex, head very densely but not very coarsely rugose, frontal impressions very feeble, with a few semirecumbent short silvery white hairs, and longer erect grayish and black hairs. Thorax broader than long, apical constriction strong, sides broadly, not very strongly, dilated, posteriorly arcuately narrowing to base, apical transverse impression nearly obsolete, basal margin reflexed, a short, deep, transverse, submarginal impression at middle of base, disc with longitudinal nearly smooth space, elsewhere densely, coarsely rugose, lateral foveæ feeble, clothed in same manner as the head. Scutellum clothed with fine, rather sparse, short, whitish pubescence. Elytra much wider than the head, humeri obtusely rounded, sides straight, parallel, slightly shorter than the abdomen, apices obtusely, separately rounded, not serrate (merely a little irregular in outline), slightly dehiscent at suture, the pubescence forming a fascia behind the middle in which the silvery-white recumbent hairs are directed both posteriorly and laterally, remainder of surface with very sparse short white hairs and longer erect black hairs, the whitish hairs being most conspicuous at the humeri and apex, before the postmedian fascia coarsely, deeply but moderately sparsely punctate (the individual punctures well separated), behind the fascia the punctuation is coarse, less deep and more crowded, elytra not more strongly depressed toward the apices, which are not at all tumid. Body beneath and abdomen sparsely pubescent with long whitish hairs, abdomen rather coarsely, moderately sparsely punctate, posterior margins of ventral segments four and five broadly testaceous. Legs black, anterior tarsi and apex of tibiæ testaceous. Length, 6 mm.

Santa Rita Mts., Arizona. One specimen collected and sent to me by H. F. Wickham.

Only one other species of *Hydnocera* known to me exceeds this in length. *H. longa*, which is one millimeter longer, is of an entirely different form, the thorax being as long as broad, and the legs are also much more elongate.

Hydnocera bimaculata, n. sp.—Large, robust, moderately depressed, aeneous-black, upper surface feebly shining, elytra and body beneath moderately shining. Head very slightly wider than the thorax, eyes large, not very prominent, ciliate with long hairs, labrum, maxillary palpi and antennæ yellowish-testaceous, labial palpi piceous, the basal joint yellowish-testaceous, antennæ moderately stout, slightly longer than the head, mass obtusely rounded at apex, head very densely, moderately, coarsely punctate, frontal impressions feeble, very sparsely clothed with recumbent silvery-white pubescence and sparse, long, erect cinereous hairs. Thorax nearly one-fourth broader than long, apical constriction moderately strong, sides broadly, moderately strongly dilated, posteriorly nearly straight and convergent to base, apical transverse impressed line distinct, not deep, basal impressed line deep, extending from side to side, the basal submargin is carinate and the carina grooved, punctuation same as that of the head, at middle of apical margin finely, transversely rugose, middle of disc smooth, lateral foveæ feeble and punctured, pubescence similar to that of the head, but with the silvery-white pubescence semierect. Scutellum densely clothed with long, whitish, recumbent hairs. Elytra wider than head and thorax, humeri obtusely rounded, sides straight, moderately narrowing posteriorly, shorter than the abdomen, apices obtusely separately rounded, finely serrate, narrowly dehiscent at suture, behind the middle a rounded yellowish-testaceous maculation, which is densely clothed with transversely directed subrecumbent long whitish pubescence, the remainder of surface with very sparse recumbent white and long semierect gray hairs, the whitish hairs being most conspicuous at base, humeral regions and behind the postmedian maculations, surface before the maculations rather coarsely, densely and confluent punctate, behind the maculations moderately, coarsely scabrous, maculations finely and densely punctured, elytra from apical two-fifths to apex rather strongly declivous, apices not tumid. Body beneath moderately clothed with long whitish hairs, abdomen sparsely pubescent, body finely, densely punctate, abdomen more coarsely, less densely punctate. Legs dark, inner margin of front tibiæ, apex of middle tibiæ and front and middle tarsi pale testaceous. Length, 5.25 mm.

Amedee, Cal., 4,200 feet. Received from H. F. Wickham.

While closely allied to *Wickhami*, it differs in too many characters to allow its union with that species; the most conspicuous differences

being in the sculpture and form of the elytra, the sides being convergent in this species, while in *Wickhami* they are parallel. It also differs from *Wickhami* in having the long, erect, black hairs of the upper surface wanting, the colour is different, and there is no trace of elytral colour markings in that species.

Hydnocera ornata, n. sp.—General form of *longicollis*. Black, shining; elytra each with a large basal maculation extending to the middle, attaining the lateral margins at base but rapidly narrowing posteriorly, narrowly interrupted at the suture, and with an obscurely clouded area near scutellum, a large somewhat irregular longitudinal maculation on lateral margin at apical third pale yellow. Pubescence rather sparse, long, semierect, white, front of head densely clothed with fine recumbent silvery white hairs. Antennæ and mouth pale yellow; eyes large, prominent, head very large, shining, coarsely, very sparsely and irregularly punctate, finely rugose above the eyes. Prothorax brightly shining, much narrower than the head, more than one-fourth longer than broad, nearly cylindrical, sides before the middle very feebly obtusely rounded, apical constriction moderate, sides parallel behind, lateral foveæ small, distinct, disc coarsely, very sparsely and vaguely punctate, sculpture somewhat rugulose at the sides. Elytra at base slightly wider than the head, humeri rather feeble, strongly attenuate, fully one-third shorter than the abdomen, dehiscent at suture, apices rounded and strongly serrate, tumid at apex, punctuation fine, nearly obsolete at base, more distinct but sparse at middle, the individual punctures well separated except on the tumefied portion, where they are very sparse and irregularly placed, some being confluent. Legs pale yellowish, clothed with long sparse white hairs. Length, 4.5 mm.

Santa Rita Mts., Arizona, 5,000–8,000 feet. Dr. F. H. Snow.

Closely allied to *H. Guatemalæ*, Gork., described from Guatemala, but that species has the elytral apices truncate, the pubescence short and depressed, and to judge by the figure (*Biologia*, III, 2, Tab. 9, fig. 3), has the elytra somewhat longer, prothorax shorter and broader, less cylindrical, and with apical and basal margins narrowly yellowish-white. *Ornata* differs from *longicollis* by the shorter thorax, sculpture of the upper surface and the colour pattern. The metasternal side pieces are densely clothed with short recumbent white pubescence. The posterior femora scarcely extend to apex of abdomen.

NEW AND LITTLE-KNOWN BEES.

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

Tetralonia fulvitaris, Cresson.—At Boulder, Colorado, May 21, 1907, Mrs. C. Bennett took two females and a male of *Tetralonia* at flowers of vetch. The male is *T. fulvitaris*, while the females are *T. frater aragalli*, Ckll. This suggests that *aragalli* is the female of *fulvitaris*, and although I cannot prove it, I believe this to be the case.

Andrena ziziaeformis, sp. nov.—♀. Length about 7 mm.; black; head transversely oval, broader than long; clypeus shining, with sparse strong punctures; process of labrum broadly truncate; cheeks rounded, not large; front striatulate, with a prominent longitudinal keel; flagellum, except basally, clear ferruginous beneath; third antennal joint nearly as long as the following three together, these being very short; pubescence dull white, caudal fimbria pale golden; tegulae testaceous; stigma and nervures clear ferruginous; legs dark brown, small joints of tarsi ferruginous. Exceedingly like *A. ziziae* (specimen collected at Milwaukee by Dr. Grænicer compared), but differing as follows: Clypeus shining; flagellum much more slender basally; face broader; frontal keel longer and more prominent; facial foveae grayish-white (not yellowish), very inconspicuous when seen from in front; thorax narrower, mesothorax with fine but evident punctures; second submarginal cell broader; first abdominal segment with very fine but evident punctures; second abdominal segment depressed about one-third; hair of abdomen whiter, and so more conspicuous.

Hab.—Falls Church, Virginia, May 30. (*Nathan Banks.*)

Melissodes saponellus, sp. nov.—♀. Length about 11 mm., anterior wing not quite 8 mm.; black, with very pale ochreous hair; disc of mesothorax exposed centrally, shining and sparsely punctured, with the bordering hairs black, but easily overlooked; hair on inner side of hind basitarsus clear ferruginous; abdomen broad, the second and following segments all covered with pale ochreous felt-like hair, the second with a median dusky band, where the hair is thin enough to partially expose the surface; hind margins of the segments (tegument) pallid, that of the first slightly iridescent, and grading into the black through a red suffusion; hair of fifth segment and sides of sixth a very pale but warm reddish, not at all black or fuscous; eyes green; flagellum, except basally, bright ferruginous beneath; tegulae shining piceous; maxillary palpi four-jointed, the last joint minute.

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Superficially this looks exactly like a *Xenoglossodes*, and especially resembles *X. imitatrix*, Ckll. and Porter, from which it differs by the less convex outer edge of mandibles, the flagellum red beneath, the black hair on thorax above, and other small details. The two species are, I think, closely related, and it is doubtful whether they should be generically separated.

Among the species of *Melissodes*, it is most like *M. Stearnsi*, Ckll., but larger and without black or fuscous hair on the legs. It cannot be the undescribed female of *M. vernonensis*, Vier., as the latter has a very much broader second submarginal cell.

Hab.—Soap Lake, Grand Coulee, Washington State, June 29, 1902. (*A. L. Melander*, No. 9.)

Robertsonella Gleasoni, Titus.—The range of this little-known genus and species is greatly extended by two males taken by Mr. N. Banks in Virginia; Glencarlyn, May 4, and Falls Church, May 30. More ventral segments are visible than in the males of the allied genera.

HONEYDEW AND THE CORNICLES OF THE APHIDIDÆ.

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

In Proc. of the Entomological Society of Washington, for Sept. to Dec., 1906, on page 114, is a discussion as to the source of honeydew in the Aphididæ. One not knowing the contrary might be misled by that discussion into thinking that the members of the society were inclined to believe that the cornicles are sometimes, if not commonly, the avenues through which this substance is expelled from the aphid body.

More than a century ago Mr. William Curtis, in his paper on "Observations on Aphides," etc. (1800), announced his discovery that honeydew is exclusively the product of Aphides, that it is their excrement, and that he "found it to proceed from the extremity of the abdomen."

He was in error, of course, in thinking that the Aphides are the only source of honeydew, but I do not know of any successful contradiction of his other two statements.

Buckton, in his "Monograph of British Aphididæ," figures an ant taking a drop from the end of one of the cornicles of an Aphid, and some later writers have copied the error.

In my studies of the plant-lice it often becomes necessary to pinch an adult between the thumb and finger to determine whether or not the specimen in hand is a male, an oviparous female, or a viviparous female.

One thing to be observed is usually the expulsion of a transparent drop of "honeydew" from the very small anal opening immediately beneath the base of the cauda. Waxy drops of white, yellow, brown, red or the deepest black fluid may usually be seen at the same time as they are expelled from the tips of the cornicles; and the embryos, the eggs, or the genital organ of the male, as the case may be, will be protruded from the large genital opening beneath the anal plate. (See figure.)

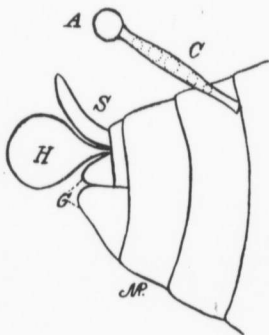


FIG. 13.—Abdomen of Aphid.

Neither the writer nor his helpers, who have been observing the Aphididae rather carefully for a few years past, have ever found "honeydew" issuing from the cornicles.

There is properly but one anal and one genital plate, each beneath the aperture named, as shown in the illustration. Or these plates might be called supra- and infra-genital plates. And then the honeydew is expelled with considerable force free from the body, while the sticky drops that are expelled from the cornicles accumulate at their ends and may run down, but do not often free themselves from the cornicles. It is probably true that the exudation from the cornicles is somewhat protective. It is difficult, however, to believe that this secretion can be very effectual in defending the Aphididae from the attacks of their predaceous and parasitic enemies.

In my observations the cornicles have always been found between the 5th and 6th segments of the abdomen, or upon the 6th, but they have not always been so drawn in published illustrations.

EXPLANATION OF FIGURE 13:

Terminal joints of abdomen of Aphid showing drop of honeydew; C, cornicle; A, drop of sticky exudation at end of cornicle; S, style or cauda; H, honeydew escaping from anal opening; G, two genital plates, between which is the genital opening. The superior of these two plates is properly the anal, or supra-genital plate, and the lower plate is properly the genital or subgenital plate.

NOTES ON THE NEW SPECIES AND VARIETIES OF
RHOPALOCERA IN WRIGHT'S BUTTERFLIES
OF THE WEST COAST.

BY KARL R. COOLIDGE, PALO ALTO, CALIF.

Mr. W. G. Wright, in his "Butterflies of the West Coast," describes thirty-two new species and varieties. A number of these, as shown by various reviewers, must be placed as synonyms, and others are but geographical races and aberrations. Unfortunately, the habitats given are vague and indefinite, and this appears to be particularly true of the new forms. The following are described and, with few exceptions, are figured :

PARNASSIDÆ.

10. *Parnassius smintheus*, var. *niger*, Wright.—This variety is founded on a single ♂, which is entirely destitute of red. Hardly worthy of varietal rank.

13. *P. smintheus*, var. *magnus*, Wright.—This is a large northern race of *smintheus*.

PAPILIONIDÆ.

25. *Papilio zolicaon*, var. *coloro*, Wright.—Described from a single specimen taken in the Colorado Desert. Differs from *zolicaon* only in deeper yellowish colour.

PIERIDÆ.

60. *Anthocharis deserti*, Wright.—Appears to be a small-sized desert form of *cethura*.

67. *Anthocharis mollis*, Wright.—I would consider this identical with *sara*.

70. *Anthocharis caliente*, Wright.—Described from a single female. It may prove to be a variety of *pima*, to which it comes closest.

NYMPHALIDÆ.

III. *Argynnis letis*, Wright.—A slight ♂ variety of *leto*.

119. *A. sordida*, Wright.—This is given as a variety of *Bremneri*, differing from the typical form in that the under surface of the secondaries has the white or buff spots more or less obsolete, and the surface is suffused with ferruginous. The specimen figured as *Bremneri* is *rhodope*, and hence we must consider *sordida* a variety of that species. No figure of *sordida* is given.

134. *A. laurina*, Wright.—An unsilvered variety of *laura*.

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160. *Melitæa olancha*, Wright.—Similar to *chalcedon*, with which it is probably identical.

163. *Melitæa sierra*, Wright.—This species is given the indefinite habitat "Sierra Nevadas." Mr. E. J. Newcomer has given me several specimens of a *Melitæa* which agree well with the description of *sierra*. They came from Lake Tahoe (Eldorado Co., Calif.), at an elevation of about 6,800 ft, and were quite common in July.

170. *M. augustina*, Wright.—Merely an aberration of *augusta*.

178. *M. eremita*, Wright.—This is another species coming from one of Mr. Wright's hidden localities in Central California. Collectors in this vicinity have noted a *Melitæa* which has been rather common in the foothills here, and which appears to be *eremita*. It is rather doubtful, however, if *eremita* will prove to be a valid species.

179. *M. hermoso*, Wright.—This species is well named, as it is indeed one of the most beautiful of the genus.

180. *M. colonia*, Wright.—Described from Mt. Hood, Oregon.

181. *M. sabina*, Wright.—Described from a single battered and dilapidated specimen.

183. *M. abnormalis*, Wright.—An aberration of *Hoffmanni*.

184. *M. mirabilis*, Wright.—Another aberration, evidently of *Hoffmanni*.

186. *M. leona*, Wright.—A variety of *leonira*, and may be *obsoleta*.

189. *M. cenita*, Wright.—From Southern California.

198. *Phyciodes pascoensis*, Wright.—A slight variety of *nycteis*.

212. *Synchlœa Californica*, Wright.—A good series of this distinct species is figured.

222. *Grapta chrysoptera*, Wright.—Mr. Fordyce Grinnell (Ent. News, Nov., 1907) has recorded this species from the San Gabriel Mts., Southern California. The types came from Mendocino and Lake counties.

AGAPETIDÆ.

249. *Satyrus Stephensi*, Wright.—This fine species is described from Northeastern California.

LYCENIDÆ.

328. *Thecla avolona*, Wright.—From Catalina Island.

347. *Chrysophanus Del Sud*, Wright, = *hermes*, Edw. — (See Coolidge, Psyche XIV, Dec., 1907). It seems rather odd that Wright

should give a description of *hermes* on one page and then on the next describe *Del Sud*, which answers the description perfectly and comes from the type locality.

382. *Lycena melimono*, Wright, = *Ly. emigdionis*, Grinnell, dimorphic ♀.—The two females b and c of *Ly. Shasta* also belong to *emigdionis*. As I have already pointed out (*Ent. News*, XVIII, p. 300), there is no ♂, Mr. Grinnell may have described it in error.

400. *Ly. sissona*, Wright.—A small species from Shasta County.

401. *Ly. astragala*, Wright.—Another tiny species, the type (a ♂) is unique.

HESPERIDÆ.

423. *Pamphila Californica*, Wright.—Found in Southern California.

441. *P. chispa*, Wright, = *P. Tecumseh*, Grinnell.

480. *Nisioniades lacustra*, Wright.—A synonym of *N. callidus*, Grinnell.

ANOTHER CHALCIDOID PARASITE OF A TICK.

BY L. O. HOWARD, WASHINGTON, D. C.

It will be remembered that in *Entomological News* for November, 1907 (pp. 375-378, fig. 1, plate XIV), the writer announced the unique breeding of a Chalcidoid parasite of the Ixodid, *Hemaphysalis leporis-palustris*, collected by Mr. J. D. Mitchell, of Victoria, Texas, on a cotton-tail rabbit in Jackson County, Texas, and that the genus *Ixodiphagus* was erected for this species, which was called *I. Texanus*. It is now his pleasure to announce that another Chalcidoid has been reared from an Ixodid under conditions that leave no doubt as to the parasitic relation already so well established in the case of *Ixodiphagus*.

April 20, 1908, Mr. H. P. Wood collected numerous specimens of a brown tick from a small Mexican dog at Corpus Christi, and sent them to the Dallas Laboratory of the Bureau of Entomology. This tick proved to be *Rhipicephalus Texanus*, Banks, recently described in Mr. Banks's Revision of the Ixodoidea, or Ticks, of the United States, Technical Series No. 15, Bureau of Entomology of the U. S. Department of Agriculture, issued June 6, 1908. The ticks were placed in charge of Mr. W. A. Hooker, of the Dallas Laboratory, who informs the writer that among them there were thirteen engorged nymphs and several slightly engorged adults. Mr. Hooker further states that the adults were placed in tubes

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and the nymphs in a pill-box, all on moist sand. On May 4th, when examined, the nymphs appeared unusually swollen, so that parasitism was suspected, and they were immediately isolated in small tubes with absorbent cotton stoppers. The posterior portion of the body of the host soon became translucent, indicating that parasite larvæ were at that end of the body. The first adult parasites appeared May 22, and 51 specimens issued from five ticks on the 22nd and 23rd.



FIG. 14.—*Hunterellus Hookeri*, female—maxillary palpus.

The full life-history of the parasite is not known, and the time and method of oviposition would be very interesting if they were known. It seems that it is the habit of the host to drop off the animal to which it is attached and to pass both moults on the ground. This would afford a good opportunity for the parasite to deposit its eggs while the young nymph is awaiting a host animal. From the fact, however, that a number of parasites issue from a single tick, there is a possibility of a polyembryonic method of development, in which case it is likely that the Chalcidid may lay its egg in the egg of the tick.

The exact dates sent in by Mr. Hooker are as follows: April 16, approximately the date when the nymphs became attached to the dog; April 20 the engorged nymphs were collected; May 12 parasites pupated; May 22 the parasites began to emerge. Parasites were bred only from nymphs, and not from larvæ or from adults.

The parasite appears to be rather closely related to *Ixodiphagus*, but will form a new genus. As pointed out in the article in *Entomological News* above referred to, *Ixodiphagus* belongs to the subfamily Encyrtinae, but does not fit into any of its tribes. It will therefore be desirable to found a new tribe, *Ixodiphagini*, to include *Ixodiphagus* and the new genus *Hunterellus*, about to be described.

Family ENCYRTIDÆ, Walker (1837).

Subfamily ENCYRTINÆ, How. (1886).

Tribe *Ixodiphagini*, How.

HUNTERELLUS, gen. nov.

Female.—Differs from *Ixodiphagus* in the following respects: Head triangular when seen from side; antennæ inserted well above middle of

face; face below insertion of antennæ well-rounded; distance between lateral ocelli and median ocellus greater than that between one of the laterals and the eye margin; maxillary palpi long; joints 2 and 3 sub-equal in length, and each as long as or longer than 1, joint 4 longer than 3.

Male.—Resembles female except in antennæ, in which the funicle joints are all of equal width, each somewhat longer than broad, and all well separated, with rounded bases and sharply truncate tips; moderately hairy; hairs not arranged in whorls.

Hunterellus Hookeri, n. sp.—*Female*.—Length, 0.85 mm.; expanse, 2.04 mm.; greatest width of fore wing, 0.35 mm. Head and mesonotum very finely shagreened, somewhat shining and furnished with many fine, short hairs. Mesopleura smooth, shining. General colour black. Antennæ dark fuscous. Front and middle tarsi and tibiæ dirty honey-yellow; hind tibiæ brownish in middle, honey-yellow at either end; front and middle femora light at distal end. Veins of wing dark brown.

Male.—Resembles female except in antennæ, which are lighter in colour. Described from four females and six males, reared May 22 from *Rhipicephalus Texanus* collected on Mexican dog at Corpus Christi, April 20, 1908.

U. S. National Museum, type No. 11,947.

PRELIMINARY REMARKS ON AMERICAN CORIZINI (HEMIPTERA).

BY C. F. BAKER, PARA, BRAZIL.

In Uhler's check list there appeared eleven North American species of this group, all under the genus *Corizus*. But one of these (*hyalinus*) had also been found in Europe. Two were species of Dallas, one of Say, two of Stal, and the remainder date from the monograph of the genus by Signoret, published in 1859 in the Ann. Ent. Soc., France. The descriptions of Signoret are largely drawn from colour characters, and have consequently been the cause of endless confusion and misunderstanding in the determination of the species. The colour forms are simply multitudinous "protean," as stated by Distant. In large series from all parts of North, Central and South America specimens may easily be discovered that exactly fit the descriptions of Signoret, but they are mostly mere links in vast intergrading series of forms. In collections where these forms are

represented by but a few specimens each, they are extremely difficult to understand. And this misunderstanding is frequently strengthened by the fact that in a single locality races are likely to be found quite pure and uniform.

The way was paved to a proper understanding of the group by Stal in the "Enumeratio," where he separated from the old genus *Corizus* a number of subgenera, leaving under the original name only certain old species grouped around *crassicornis*. These subgenera were exceedingly well founded, since in a study of many species, other co-ordinated characters may be discovered which were not used by Stal. These groups are as well founded as the generally recognized and nearly related *Maccavethus*, *Brachycarenum* and *Corizomorpha*, and are much more readily separable than many other genera of the Coreidæ. For my own convenience I call them "genera." Apart from other considerations, however, a careful study of these groups of Stal is the only path towards bringing order out of the utter confusion in the arrangement of the species in most American collections.

I have already before me something more than a thousand specimens of this group. Many of these specimens have previously been studied by Dr. Uhler and Mr. Heidemann. I have made a preliminary arrangement of all this material, and shall be glad now to undertake the determination of other collections, adding to such collections forms lacking to them in return for any duplicates retained.

Genus *CORIZUS*, Fall.

But one species belonging to this genus, as limited by Stal, has ever been described for North America—*novaboracensis*, recognized by Fitch and described by Signoret. In American collections pale forms of this are commonly referred to *hyalinus*, which belongs in a different genus. *Novaboracensis* is one of the most distinct species in the American fauna, and is represented by various forms, especially towards the West. *Pallidus* is a very common pale form found from Colorado to Nevada, but it agrees in all essential characters with *novaboracensis*, and intergrades it throughout its range. Some of the commoner forms of this species may be temporarily separated as follows :

- A. Smaller pale greenish forms; western *pallidus*, Baker.
- AA. Larger, darker, brownish to blackish forms.
- B. Scutel yellowish, whole insect pale brown ;
Nevada *intermedia*, Baker.
- BB. Scutel brown to black, body of various shades of brown,
but mostly dark.
- C. Length, 6-7 mm.; E. U. S. to Nevada . *novaboracensis*, Fh.
- CC. Length, 7-9 mm.; Colo. to Nevada . *occidentalis*, Baker.
- BBB. Scutel and most of the body above, with the legs,
black *plutonius*, Baker.

Genus LIORHYSSUS, Stal.

This genus has but one known American species, *hyalinus*, with numerous forms everywhere. In but few cases are these even geographical, since the same ones constantly recur in widely-separated localities and in all sorts of combinations. Only in the extreme south have I found any clearly-marked varieties. In Cuba all the individuals taken by me are very dark, with disc of pronotum almost black. Some of these southern forms deserve distinguishing names, if South American extensions of the species have not already been named. Uhler has described one of the western forms as *viridicatus*.

Genus NIESTHREA, Stal.

This genus contains the most highly-coloured species of the group, and is the largest genus in North America. Frequently small forms had been determined for me as *ventralis* and *side*, but both of these, together with *scutatus* and *validus*, were originally described as about 10 mm. in length. The large forms constitute a well-defined series, which, with a large amount of material before me, I believe to be of but specific value. The *validus* of Uhler varies completely into the *scutatus* of Stal, which is one of the most common species of the Pacific Slope. *Ventralis* is but *side* with lateral rows of black dots on each ventral segment. Large series collected in Nevada, Middle and Southern California and Mexico illustrate very clearly the relation between these large forms. The small forms of the genus known to me appear to belong to but three specific groups, but with many forms each; these are the *lateralis* of Say, the *pictipes* of Stal, and the *side* of Fabricius. *Nigristernum*, recognized by Fitch and described by Signoret, I believe to be the merest colour-form of *lateralis*.

The typical form of *lateralis* is common in the Middle States, extending far to the east and far to the West, and presenting a number of conspicuous forms. Individuals more or less suffused with red may occur in almost any of the species, and especially in this. However, in the mountains of Southern California I found a uniform race of small roseate-hued individuals that certainly deserve separate recognition, and I have given them the form name *roseus*. The *luteolus* of Distant appears to be but a mere variety of *lateralis*. The *punctatus* of Signoret (determined at various times for me as *ventralis*, which is a far larger and paler form) ranges from the North-eastern United States into Mexico and Central America, and as a general thing is remarkably uniform for one of this group. I collected a smaller paler form in Nicaragua. Structurally, *punctatus* is extremely close to *lateralis*.

The specific group, *pictipes* of Stal, is essentially southern, forms of the species being abundant in West Indies, Mexico, Central and South America. I have many specimens of a very uniform race from Louisiana, and doubtless it will be found eastward and westward in the Gulf States. Most abundant in Nicaragua is the form of this species named *nebulosus*.

Genus ARHYSSUS, Stal.

Stal made *punctiventris* of Dallas the type of this group. The short antennæ, general form, and the very bristly head and thorax, are quite characteristic. After I had separated all of my material of this group, a search was made for determined *punctiventris*. Curiously enough, species were found in each of the other three genera which had been determined as *punctiventris*, but none in the group of which it had been made the type. Although published seven years previously, yet not one of the Dallas species is mentioned in the "Monographie du Genre Corizus." But I believe that Signoret had the true *punctiventris* of Dallas, and described it under the name of *Bohemani*. It is found throughout the United States, and occurs in most general collections of Heteroptera, though I have yet encountered no specimens properly named. *Pilosus* and *parvicornis*, both of which I have collected in the extreme south, have no good structural characters to separate them from *punctiventris* except size, and numerous intermediate forms occur. The *borealis* of Uhler had been reduced to *punctiventris*, but this reference is in doubt, since of various forms determined as *punctiventris* for me by Dr. Uhler, none are even *Arhyssus*.

GEOMETRID NOTES, WITH DESCRIPTIONS OF NEW SPECIES.

BY L. W. SWETT, BEDFORD, MASS.

Eupithecia Russeliata, n. sp.—Expands 13–16 mm., palpi $\frac{1}{2}$ mm., general colour grayish white, antennæ not ciliated.

This species seems to vary in size and colour, but the markings remain distinct. Fore wings of a grayish white, with four distinct black patches on costa the beginnings of lines. The basal is indistinct and broken on the median vein, the intradiscal runs to inner margin in a series of waves, the discal spot is black, very large, round and prominent. The extradiscal line is rounded out below costa and opposite discal spot, appearing like dots on the veins and curving inwardly on vein 3 to inner margin. A pale broad band borders the extradiscal line, following the same course, then comes the marginal area, suffused broadly with gray, through which a narrow zigzag line runs to inner margin, fringe gray. Hind wings same colour as fore wings, with traces of five lines, the first three of which are shown only in dots on the inner angle, a small linear discal spot, then a broad dark dotted line accentuated on veins, rather irregular in its course, runs up to meet the extradiscal line of fore wings, beyond a broad pale band, then a dotted line taking the same course as the extradiscal, another pale band and marginal dots; fringe longer than on fore wings and grayish; body ash-coloured. Beneath paler than above, with the two extra bands very prominent, rounded out opposite discal spot and curving to about vein 5, then inwardly towards body. Hind wings the same except that the lines are more dotted on the veins, and the extradiscal makes a deep dip at about vein 4. This species seems to be quite widely distributed over the Atlantic region.

Co-types, 3 ♂s, 3 ♀s. Winchendon, Mass. (April 12), Dr. Russel; Framingham (April 23, '05), Mr. Frost; Taunton, Mass. (L. Swett), April 14; Newark, N. J. (Mr. Broadwell), April 6. I take pleasure in naming this species after my friend Dr. Russel, of Winchendon, Mass.

Eupithecia Brauneata, n. sp.—Expands 22 mm., antennæ very slightly ciliated beneath, palpi very short, general colour dark gray.

Fore wings dark fuscous-gray, a faint wavy inner band, then a broad dark band straighter on inner side than outer, on the outer has a projection opposite the discal spot, then runs irregularly to the inner margin. This is bordered with a pale band, then a narrow irregular line runs from costa,

just outside the linear discal spot, to the inner margin, a broad gray area, then a black patch runs down from the costa sharply angled outwardly, with a narrow line represented by dots running straight to inner margin. A pale band beyond this of the same shape, with a faint line running through the centre; the edge of the wing is bordered broadly with fuscous through which a zigzag white line runs to inner margin, ending in two white twin spots. Hind wings dusky, with traces of lines, intervenular dots on both wings, fringe, intradiscal and extradiscal lines are broad and black, discal spot prominent as above, hardly noticeable on the hind wings, as they have above two broad wavy extradiscal bands; and the edges of fore and hind wings have a dark border, which has a mottled appearance.

Types, ♂ and ♀, Mountain Lake, Va., June 14-21, 1907. The ♂ type is in Miss Braun's collection, the ♀, through her kindness, in my own.

Co-types, 2 ♀s, Mountain Lake, Va., June 14-21, 1907. Miss A. F. Braun, all in her collection.

This pretty and distinct species I have named after Miss Braun, who kindly sent me the specimens.

Eupithecia interruptofasciata (Packard).—This species was first described in the 5th Report of the Peabody Academy of Sciences, the types being two females, Texax (Belfrage), October and November. One male, Mass. (Sanborn) and two males, Albany, N. Y., (Lintner). This species Packard confused more than any other, and there were many labelled *interruptofasciata* in his collection which I knew by the localities could not be the types; these he must have added when he wrote the Monograph. After a search I discovered the two female types with the correct date and locality, and agreeing with the description, but no males could I find, and finally I remembered that in many cases Packard returned the types to the owners after describing them, so, as the locality was Albany, I surmised they might be in the Lintner collection. I wrote to my kind friend, Dr. Felt, and he replied that the two male types were there, as the Lintner collection had been kept intact, and gave me additional information of great value. As I had to go on business to Albany, I determined to look over the types, and sure enough I found them with the correct labels, as follows: No. 1833, ♂, *E. interruptofasciata* (Pack.), and beneath a second label, *Eup. miserulata* (Grote), as if he doubted the species. The other male was labelled 1833a, ♂ ? and

bore the same label as the first. After studying them carefully, I was surprised to find the two were different species, and both males, and also not conspecific with the two females at Cambridge, making three species under one name. The two female (Texas) types were alike, but the males were different species. The third male type (Mass.), Sanborn, I have been unable to locate, though it may come to light in some of the Boston Society of Natural History collections. The first male type, No. 1833 E, is quite large, has strongly-ciliated antennæ, long palpi, and pale outer extradiscal band strongly angulated below costa and prominent discal spot, wings dusky gray in colour. It comes rather close to my new species, *Eupithecia Grossbeckiata*, but is almost twice as large and with different markings. The second male, No. 1833a, is much smaller, of a dull gray, and markings much like the first, only the antennæ are simple and the palpi are very short. This is a male, though doubtfully labelled by Packard; so we have two males not conspecific, and, so far as I know, undescribed. I have retained the name *interruptofasciata* (Pack.) on the two female Texas types (Belfrage), Oct. and Nov., as they are conspecific and in Packard's own collection at Cambridge, Mass. I am not prepared to say what the two male Albany types are, except that at present they are undescribed so far as I know. Last fall I took the males of *E. interruptofasciata* in September, sparingly on the under side of White Pine limbs at Bedford, Mass., and they agree exactly with the Texas females, and have simple antennæ. I shall make my males co-types, and deposit one with Dr. Felt at Albany, so that he may have the species. Mr. Taylor sent me one some time ago, among some *Eupithecias* for identification, which I believe was bred by Dr. Fletcher on the Juniper; it is slightly more of a brownish cast, where mine are gray. Early in May I take a species, very close to *interruptofasciata*, yet there are marked differences, such as heavier extradiscal lines and no wave in it, but the species may be double-brooded and variable. This species, *Eupithecia interruptofasciata*, is easily told by the dashes on the veins from the extradiscal line, and the line itself, when near inner margin, is bowed inwardly towards the body. This I think settles the standing of this species, as I know every type but the Mass. (Sanborn). It is not common with me, as I only take about six specimens every fall, and the males are less numerous than females. I wish to thank Dr. Felt and Mr. Samuel Henshaw for valuable information and assistance, also Mr. Young, of Albany, N. Y.

ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Entomological Society has held its regular meetings, as far as possible, every alternate week during the College year. The first meeting of the fall term was held on October 16th, and the last meeting of the spring term on March 18th.

As the headquarters of the Society are now at the Ontario Agricultural College, Guelph, a majority of the regular attendants are, as would be expected, college students who are interested in some form of insect study. This fact has naturally had considerable influence upon the choice of the subjects for the different meetings. It has been found that by careful selection of desirable subjects and by encouraging the students to take an active part in the preparation of such subjects and in the discussions that follow the reading of each paper, the meetings become of great value to them and supplement the regular class-room work. A gratifying amount of enthusiasm has been shown by the members of the Society throughout the year, and prospects are bright for still better work next year.

The following is a list of the papers read :

"The Cynipid Galls," by W. R. Thompson (3rd-year student).

"The Fight Against the Brown-tail Moth in Nova Scotia," by T. Brady (3rd-year student).

"Wing Classification of the Heteropterous Land Forms," by R. C. Treherne (3rd-year student).

"Parasitism," by G. M. Frier (4th-year student).

"Adaptations of Aquatic Insects," by L. Cæsar (4th-year student).

"Fungi that Attack Insects," by J. W. Eastham (Demonstrator in Botany)

"Insects as Carriers of Disease," by T. D. Jarvis (Lecturer in Entomology).

"Reminiscences of Entomologists Whom I Have Known," by C. J. S. Bethune (Professor of Entomology).

In regard to the above papers, it should be said that Mr. Brady's account of the "Fight Against the Brown-tail Moth of Nova Scotia" was given from his own experience in the Annapolis Valley in the summer of 1907. He was one of a number of men employed by the Government of the Province to combat this new pest, which had spread from the New England States and was rapidly becoming alarmingly abundant in the Annapolis Valley district.

Dr. Bethune's paper on "Reminiscences of Entomologists Whom I Have Known," was given in response to the request of the Society. On account of the doctor's wide and long-continued acquaintanceship with numerous famous entomologists, the members felt that an address of this kind would be very valuable in making them more intimate with the leading men in entomology and the work that was being done by them both in England and America to-day. The paper, though dealing with such a broad field, was full of the pleasure and profit that had been expected.— [L. CÆSAR, Secretary.