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FURTHER NOTES ON ALBERTA LEPIDOPTERA.

BY F. H. WOLLEY DOD, MILLARVILLE, ALTA.

(Continued from Vol. XLIII, page 399.)

278. *Ufeus plicatus* Grt.—I have not seen the type of this species, but what I have as such is the *plicatus* of the British Museum and most other collections that I have seen. It differs principally from what I hold as *satyricus*, probably also correctly, in being redder, having larger wings, with more acute apices, the transverse lines narrower and less diffuse, the t. a. deeply dentate rather than curved. There are other distinctive characters, but these seem the most reliable and most obvious. Of *barometricus* Goosens, I know nothing beyond the mere reference given in Dyar's Catalogue. *Hulstii* Smith was described in Ann. N. Y. Acad. Sci., XVIII, p. 99, Jan., 1908, from two males from Stockton, Utah, and Black Hills, Wyoming. The type is the Stockton specimen, whence I have a pair, the female of which I have compared with it. The description states that it is "perhaps nearest to *satyricus* in type of maculation, but differs obviously in colour, in the absence of all trace of ordinary spots, and in the immaculate under side." In my Stockton male the discoidal spots are practically obsolete, in the female they are very distinctly marked. The under sides are very pale, but not quite immaculate. These obviously merge into my series of *Calgary plicatus*, and if mixed they would be inseparable without the labels. I would suggest that Prof. Smith's comparing *hulstii* to *satyricus* was a slip. The species is a decided rarity here.

279. *U. satyricus* Grt.—I have never found this in any numbers, though it is much less rare than the preceding. It is extremely variable in the quantity and distribution of black and dark brown scales.

280. *Agrotiphila incognita* Smith.—This species is not in my collection, but I have seen the two male types from Laggan, though one of them is only labelled "B. C." in error. A male is in the British Museum, taken by Mrs. Nicholl in 1907, on Brobokton Creek, in the mountains far north of Laggan.

281. *A. maculata* Smith.—Though less rare than the preceding, this seems never to have been taken in any numbers. I have taken a few myself at Laggan, and Mrs. Nicholl has taken a few there and on Mt. Athabasca, and near Lake O'Hara, on the British Columbian side of the divide. My dates are all between July 16th and 27th. It is an above-timber species, occurring between 7,000 feet and the summits, though I have not been on any above 9,000 feet.

283. *Mamestra mystica* Smith.—In my note on this species in Vol. XXXVII, p. 151, line 5, for "The palest *discalis* and the darkest *mystica*," read, "the darkest *discalis* and the palest *mystica*." I overlooked the slip in the proofs. As to the distinctness of these two, there can be no doubt. In colour *discalis* is pale blue-gray, *mystica* lacks the bluish tint and is browner. They are also distinguishable on the characters previously pointed out. In colour and ornamentation *mystica* is really nearer *nimbosa*, and occasional specimens are indistinguishable. I had almost decided that they were forms of one species, when I discovered slight antennal differences, which may, however, prove to intergrade, though I have not both forms from the same locality. In my males of *nimbosa* from Montreal; Milwaukee Co., Wis.; and Vancouver Island, the antennæ are ciliate and bristled, with the joints scarcely marked. Some Pacific coast specimens have the ground colour very clean, with the brown irrorations very much reduced, though so far I have found nothing else about them to suggest distinctness of species. In my *mystica*, from Miniota, Man.; Alberta; and Windermere, B. C., the male antennæ are minutely serrate, fasciculate and bristled, the bristle appearing to be longest in Miniota, and shortest in Windermere specimens. In some of those from Miniota, however, the joints are scarcely marked, and the character may fail as distinctive. Sir George Hampson places *mystica* and *nimbosa*, with *rogenhoferi*, in a different group from *discalis* and *imbrifera* on antennal characters, as having them ciliate only. He has *mystica* from the type locality, Winnipeg, and I have not, though I have seen the type, and know the species well. *Discalis* has male antennæ serrate-fasciculate, but the serrations are not more prominent than in most of my *mystica*, and the bristle seems to be lacking. The type of *nimbosa* is a male in the British Museum from Trenton Falls, New York.

284. *M. imbrifera* Grt.—I have seen the type of this species in the British Museum, a female, which, according to the Catalogue, comes from

Trenton Falls, N. Y., the same locality as *nimbosa*. The male antennæ are minutely serrate-fasciculate, and strongly bristled. The serrations are less coarse though more distinct than in *nimbosa*, *mystica* or *discalis*, and the bristle longer than in the two former, *discalis* having none. I have it from Montreal; Biddeford, Maine; several Manitoba localities, and Red Deer River, near Gleichen, Alta. It seems much less common here in the hills, though I took a couple in the Upper Columbia valley, near Windermere, B. C. *Rogenhoferi* Möschler, as catalogued by Sir George Hampson, has male antennæ ciliate only. He had no specimens under the name in the collection, but figures as such a male from "W. Manitoba" in Prof. Smith's collection. This specimen I have examined. The label is, I think, in Mr. Hanham's writing, and the "W" probably stands for Winnipeg. When I saw it, it had a small piece only of one antenna, which my notes say were "ciliate, with joints little marked." It is something distinct from *imbrifera*, which I have often received under the name, and a species unfamiliar to me. Prof. Smith, in his Monograph of Mamestra, states that he has examined the male type from Labrador in Mr. Möschler's collection, and that "the antennal joints are distinctly serrated, and furnished with bristly tufts." (Pr. U. S. N. M., XIV, 204, 1891.) This leaves some doubt as to the correctness of the identity of the Rutgers' college specimen.

284. The single specimen which I recorded under this number as *juncimacula* is probably a variation of *purpurissata* Grt. It is, however, extremely like Holland's figure of *juncimacula*, stated in the text to occur in Colorado, which is therefore presumably the locality of the specimen figured. Sir George Hampson's figure of a Colorado female is much more like the form described by Dr. Dyar from Kaslo as var. *crydina* (CAN. ENT., XXXVI, 32, 1904). Hampson lists *crydina* as a synonym of *purpurissata*, but had no Kaslo specimens in the collection. Prof. Smith, in Journ. N. Y. Ent. Soc., XV, 152, 1907, claims that *crydina* is a good species. I thought that might be so at one time, but after studying more material I find that the Kaslo form, as stated under the description, intergrades with eastern *purpurissata*, which is the predominating form at Calgary. The type of *juncimacula* Smith, is a male in the Washington collection, bearing no locality label. Neither, by the way, is the labelled "type" in Prof. Smith's handwriting, though bearing the Museum red type label. I have not seen the description, but the form appears to have

been described from the mountains of Colorado as a *purpurissata*, and subsequently, in Ent. News, IX, 241, Dec., 1898, separated as a species. My only Colorado specimen is a female from Durango, and looks like an obscure *purpurissata* merely. Vancouver Island specimens are paler and more distinctly maculate than any others that I have. I believe that *crydina* is merely a strongly marked form of *purpurissata*, and *juncimacula* is very doubtfully distinct.

287. *M. columbia* Smith.—I have seen two specimens of this form marked "type," both males labelled "Ft. Calgary, B. C.," one in the Neumögen collection, and the other at Washington. The description refers to both male and female types, which may be an error. In 1884, when Capt. Geddes collected the specimens, Calgary was merely a Northwest Mounted Police fort. The "B. C." error I have repeatedly corrected. Closer acquaintance has brought me to look upon this as a local race of *meditata* Grt. The majority of Calgary specimens are considerably paler than *meditata* from the Eastern States, and tinged with reddish rather than brown. Specimens from Cartwright, Man., and Redvers, Sask., include obvious intergrades, as well as specimens inseparable from some in both eastern and Calgary series, except in being smaller, as is usual with Manitoba and Saskatchewan races. *Determinata* Smith is a Colorado form very closely allied to these, with darker central band, and rather conspicuous discoidal spots, those in *meditata* and *columbia* being usually rather obscure, and sometimes scarcely discernible. Sir George Hampson separates *determinata* from the other two in the tables on the character of the orbicular being concave anteriorly. This is a variable character in my *columbia* series, in which I do not suspect two species. I have only a single Colorado male in my collection, from Colorado Springs, and a few of my local specimens come very near it. Prof. Smith has a good series from California.

288. *M. cervina* Smith.—I do not feel at all confident that this is distinct from *lustralis*, of which the type is a Wisconsin female in the British Museum. The eastern form does not appear to be very common, and I have not the material to enable me to form a definite opinion. The character by which Hampson separates *lustralis* from *cervina* in the table is the presence in the former of a black mark preceding the white patch near the anal angle in submedian fold. In his description, however, the mark is called brown. A brown mark is faintly discernible here in some of my local series of *cervina*. It is rather more evident in my one *lustralis*

from an unknown locality, and two from Sudbury, Ontario, which are the only eastern specimens which I possess. However, I see no differences that I should suspect of being specific. Cartwright and Miniota specimens in my collection are alike, and probably more typical *cervina* than those from Alberta, being a little smaller and darker. *Teniocampa suffusa* Smith, type, is an Arizona female in the Washington Museum, and appeared to me to be a pale *lustralis*, and is referred to that species by its author in his Check List.

(289. *M. segregata* Smith.

(290. *var. gussata* Smith.—I am convinced that these two are the same species. Dr. Dyar suggests in the Kootenai List that *gussata* is only a variety of *segregata*, and I agree with him. *Gussata* is less highly coloured than *segregata*, and has more black markings. In my former notes I stated that Sir George Hampson considered the two to be the same species. That was his opinion expressed in a letter to me about that time. Before publishing, however, he altered his opinion, as he places *segregata* in the genus *Polia*, and *gussata* in *Hyssia*, separating them in the Catalogue by 136 pages, and figures a Calgary specimen under each name. Prof. Smith, in Journ. N. Y. Ent. Soc., XV, 156-7, Sept., 1907, closely analyzes Hampson's descriptions of *Polia* and *Hyssia* and points out that there is no tangible difference except a very doubtful one of abdominal tufting. At the same time, he makes no suggestion that *segregata* and *gussata* are the same.

291. *M. negussa* Smith.—A series received from Redvers, Sask., from Mr. Croker, is very constant, which fact, in this genus, I accept as evidence in favour of distinctness from *segregata*, which the form resembles in almost every respect, only entirely lacking all black markings. Hampson places it in *Polia*, and figures a Calgary specimen as *plicata*, of which he makes it a synonym. The figure is bad, and too contrasting. He mentions in his description that the discoidal spots are defined by black, which is not the case in any of my Calgary or Redvers specimens. The male type of *plicata* from Glenwood Springs, Colo., has the spots outlined in black, and a black basal streak, agreeing in these respects with my only specimen from that locality, a female. *Negussa* is also slightly smaller, but whether really distinct I will not at present venture to suggest.

292. *M. neoterica* Smith.—I have now seen the types of this species from Winnipeg, and have a similar series in my collection from Cartwright. This form is small and rather dull and even in colour. Walker's type of *detracta* is a male in the British Museum from Trenton Falls, N.Y., where is also Grote's *claviplena* from Evans Centre. These two are certainly one species, and I cannot see that *neoterica* is anything but a local variation of it. Typical *detracta* is larger, more olivaceous, and usually far less even in colour. Calgary specimens are intermediate in average size, but nearest the eastern form in colour. Calgary and eastern specimens can be found exactly alike, but usually the former are paler. Dr. Dyar in the Kootenai List refers *neoterica* as a race of *detracta*, and mentions that the Kaslo form differs slightly from either, being dull and even like *neoterica* and large, like *detracta*. I have some from Provo, Utah, which are most like the Kaslo form, but paler. The relative difference in size between the sexes at Calgary and in the east, does not appear to be constant, the females seeming to average a trifle smaller than the males where the species occurs.

294. *M. meodana* Smith.—(Journ. N.Y. Ent. Soc., XVIII, 95, June, 1910.) This is the name which Prof. Smith has given to what I had listed as *liquida*, and he made a Calgary male and female type, and co-types from Calgary; Pullman, Wash.; Yellowstone Park, Wyo.; Arrowhead Lake, B.C.; and Denver, Colo. He says: "The species has been confused with *liquida* Grt., which is a much more contrastingly mottled form occurring in Washington, and probably over a similar range. *Liquida*, as described, and as figured by Hampson, has narrower, more pointed primaries, and while the type of maculation is similar, *meodana* is neatly and quietly ornamented, while *liquida* is strongly contrasted and showy." In Ent News., XXI, 398, Nov., 1910, I commented upon the forms, expressing a doubt as to their distinctness as species. I have little to add to that. Vancouver Island specimens in my collection are a bit brighter than typical *meodana*, which I look upon as variation rather than a species.

297. *M. nevadæ* Grt.—One of my Calgary specimens I have compared with the type, a female (not male as stated in the Catalogue), in the British Museum, from the Sierra Nevada, California. Banff and Kaslo specimens are similar. Sir George Hampson makes *canadensis* Smith a synonym, as had previously been suggested by Dr. Dyar in the Kootenai

List. Prof. Smith, in Journ. N. Y. Ent. Soc., XV, 153, Sept., 1907, takes exception to this view, but suggests that they may be races only. He states that *nevadae* is much brighter, more contrasting, and broader winged than *canadensis*. The latter was described from a unique male from the Province of New Brunswick, and the type, which I have not seen, is probably in the Thaxter collection in the Museum of Comparative Zoology at Cambridge, Mass. Dr. Dyar says that specimens from Wisconsin and from Kaslo, B. C., in the Washington Museum, are alike. I saw them there, and have no note that they differed. They stood, by the way, under *canadensis*, whilst Calgary specimens did duty for *nevadae*. The *canadensis* of Prof. Smith's collection was a badly worn male from Winnipeg, which I should call about typical *nevadae*. Last winter I examined a specimen from Hymers, Ontario, belonging to Mr. Winn, which I thought might be typical *canadensis*, as it almost entirely lacked the red shades of *nevadae*, though doubtfully distinct therefrom. But, according to the description, red shades exist in *canadensis*. At present I have no evidence in favour of distinctness, though it requires more material to permit of a fair judgment.

298. *M. invalida* Smith.—I have not taken this species here for some years, but it seems to be of more frequent occurrence at Banff, whence I have a few. I have no males in my collection, and I notice that an absence of that sex is complained of under the description, made from specimens from Sierra Nevada and Placer Co., Calif. I have seen a type at Rutgers College, another at Washington, and three are in the Henry Edwards collection, though I overlooked these. My Alberta specimens appear to be the same species. I have examined the type of Walker's *crisifera* in the British Museum, a worn specimen from St. Martin's Falls, Albany River, Hudson's Bay Territory. It is the specimen figured by Hampson, but most of the pale shades shown in the figure merely denote the worn condition of the specimen. He makes *lubens* Grt., "ab. 1," and *rufula* Morr., a synonym. Of the latter I know nothing, but *lubens*, of which the female type from New York is in the Museum also, is easily distinct, as pointed out originally by Grote in CAN. ENT., XXVI, 141-146, 1894, and latterly by Prof. Smith, who has suggested that *crisifera* may be prior to his *invalida*. I know nothing against the suggestion, and were it not that the worn condition of *crisifera* type leaves an element of doubt, I should say it was certainly correct.

NEW COLEOPTERA CHIEFLY FROM THE SOUTHWEST.—V.

BY H. C. FALL, PASADENA, CAL.

The new species herein described have, with a single exception, come to hand during the past year (1911) and seem worthy of prompt publication.

Quedius compransor, n. sp.

Robust, head and prothorax black, elytra and abdomen dark rufous, the latter dusky toward the base. Head including the mandibles (σ) slightly longer than wide, gradually wider posteriorly; eyes small, not at all prominent, distant from the nuchal constriction by about $2\frac{1}{2}$ times their longest diameter; a large setigerous puncture at the base of the antennæ, one at the upper margin of the eye, and two others posteriorly in a transverse line and fully twice as far from the eye as from the nuchal constriction; front without punctures. Labrum bilobed. Antennæ rather stout, filiform, but little longer than the head, joints 4-10 subsimilar and a little wider than long. Prothorax about $\frac{1}{4}$ wider than the head, $\frac{1}{5}$ wider than long and evidently wider than the elytra at base, and equal to the width of the latter posteriorly; narrowed in front, sides rounding into the base with but feeble evidence of hind angles; disk entirely without punctures, margin evidently but not strongly explanate posteriorly. Scutellum impunctate. Elytra subequal in length to the prothorax, punctation fine and rather close throughout. Abdomen similarly but slightly less closely and evenly punctate. Head beneath with a few fine scattered punctures, lateral carina broadly interrupted. Hind tibiæ spinulose.

Length 9-11 mm.; width 2.5-3.2 mm.

Manhattan, Kansas.

Described from three males sent me by Mr. Knaus, who writes that they were taken Jan. 6, from the burrow of a "pocket gopher."

By Horn's table this interesting species would fall with *spelaeus*, to which it is allied by the small eyes and explanate side margins of the thorax, this latter character being however less marked than in *spelaeus*. It differs from *spelaeus* in its stouter form, colour, ovate head (parallel at sides in *spelaeus*), with the infraorbital carina obliterated except toward its extremities, and the absence of the usual discal series of punctures near the front of the pronotum, the marginal punctures only being present. The surface of the head and pronotum appears to the eye to be smooth and polished, but as in most species of the genus is really strigillate with

a system of exceedingly fine wavy lines with sparse very minute feebly impressed punctures, a little more evident on the head.

This is the first species to be described from our fauna without discal pronotal punctures. It is not possible to assert that their absence is constant, although completely wanting in the three specimens before me.

Tritoma tenebrosa, n. sp.

Very similar in size, form and colour to *unicolor*; broadly ovate, black, mouth, antennal stem, tarsi and tip of last ventral segment dark rufous or rufopiceous, upper surface very finely alutaceous throughout and rather dull. Head closely, distinctly but not coarsely punctate. Prothorax finely rather sparsely punctulate; punctures of elytral series moderately strong and close, nearly as in *unicolor*; intervals minutely sparsely punctulate. Body beneath dull, rather finely sparsely punctate, the ventral segments more closely so.

Length 4.8 mm.; width 2.75 mm.

Southern Pines, N.C. (Rev. A. H. Manee).

The resemblance to *unicolor* is very close in all respects except the lustre and sculpture of the pronotum, which in the latter species is strongly shining without alutaceous sculpture and with the punctation relatively very coarse. *Angulata* is more nearly in agreement with *tenebrosa* in punctation and surface lustre, but it is distinctly smaller, with finer less closely punctured elytral striae and red legs.

Agrilus strigicollis, n. sp.

Form moderately stout, about as in *pensus* and *obolinus*, moderately shining, æneous, prothorax somewhat cupreous, beneath cupreo-æneous. Antennæ barely attaining the middle of the prothorax, serrate from the fifth joint, which is a little longer than wide, the following ones wider than long. Front broadly and rather deeply concave in superior half, the concavity confluent with a smaller post-clypeal impression, coarsely closely punctate, the punctures uniting in part to form short rugæ. Prothorax a little wider than long, sides nearly straight and parallel, narrowed only at the anterior angles; median line rather deeply impressed throughout, the impression broader behind; surface coarsely transversely strigose in wavy lines at the middle, the strigæ becoming longitudinal laterally; hind angles not carinate though with an obtuse elevation in the position of the usual carina, within which is a small basal impression, and another larger at the middle of the outer margin. Scutellum impressed and without transverse carina. Elytra scarcely sinuate behind the humeri, gradually narrowed

from about the middle, apices separately rounded and finely serrulate, surface rather coarsely imbricate, disk a little flattened at middle, pubescence very short, sparse and recurved, evenly distributed. Prosternum rather densely punctate and with short recurved pubescence, lobe truncate and feebly emarginate; intercoxal process rather broad and seemingly obtuse at apex. Abdomen moderately punctate, last segment with a small emargination at apex; pygidium without projecting carina. Claws deeply cleft, the apices of the inner portions nearly in contact.

Length 9 mm.; width 2.35 mm.

The type is a female from the Huachuca Mts. of Arizona, collected and given me by Mr. Carl R. Coolidge.

This species is at once separable from any of our previously described forms by the combination of antennal and unguis character, no other species with the serration of the antennæ beginning with the fifth joint having the long inflexed claw tooth.

Diphyllostoma Fall.

The discovery of a second species of this remarkable Lucanid genus is, like the first, due to Mr. Ralph Hopping, of Kaweah, California. Of the specimens sent Mr. Hopping writes: "The Lucanid seems to have different habits from *fimbriata*, flying about 10 a.m. and in the pines at 6,600 ft. elevation, whereas *fimbriata* seems to be a night flier at 1,000 ft. A reference to the original description of *fimbriata* shows that at least one specimen of that species was taken in flight shortly after noon and it is doubtful if this distinction is more than incidental; the difference in altitude however is probably of more significance.

The new form agrees very closely in all essentials and most details with *fimbriata* and it is only necessary to refer the student to the description of the latter (CAN. ENT., 1901, p. 289), and state the differences.

D. nigricollis.

Form slightly narrower than in *fimbriata*, the prothorax a little smaller and black, the elytra piceo-testaceous, in *fimbriata* dark brown or castaneous and concolorous throughout; mandibular process less strongly emarginate; prothorax distinctly more finely and sparsely punctate, the elytra similarly but less deeply sculptured than in *fimbriata*. Tarsi a little longer and more slender, the joints more than three times as long as wide, while in *fimbriata* they are less than three times as long as wide.

Length $6\frac{1}{2}$ -8 mm.

Described from ten examples—all ♂s—taken at Huckleberry Meadow, Fresno Co., California, July 15 and Aug. 1; elevation, 6,600 ft.

Cremastochilus quadratus, n. sp.

Black, subopaque, above with very sparse short brownish erect or suberect hairs which become on the pronotal disk distinctly squamiform, varying from two to three times as long as wide; hairs beneath sparse and very short, stiff and setiform. Mentum deeply and regularly cupuliform, the margin entire. Head as in *schaumii* and *westwoodi*. Prothorax nearly one-half wider than long, widest across the hind angles which are not at all retracted, sides very broadly and just visibly sinuate before the hind angles, arcuately narrowed in front, the apex $\frac{3}{5}$ as wide as the base; front angles foveate, hind angles rectangular, triangularly smooth above, not limited within by an impression; disk broadly convex, median line impressed, punctures coarse and shallow, dense at sides, well separated toward the middle. Elytra moderately flattened, rather more so than in *westwoodi*, sculpture as in the latter species. Pygidium coarsely cribrate punctate. Body beneath coarsely moderately closely punctate. Tibiæ distinctly less broad than in *westwoodi*; front tarsi short, passing the apex of the tibiæ by only the terminal joint, or slightly more; middle tarsi subequal in length to the tibiæ; hind tarsi a little shorter than the tibiæ. All the tarsal joints are concavely compressed laterally, more strongly so basally, so that when viewed from above the joints appear much narrower at base.

Length 12.5-14 mm.: width 5-5.8 mm.

Described from three examples sent by Mr. Junius Henderson, of the University of Colorado, who took them at Ft. Mojave on the Colorado River in Western Arizona, March 16, 1911.

As indicated in the description, this insect is most nearly related to *C. westwoodi*, to which the student would be led by attempting to identify it by Horn's table of the genus. It differs markedly from that and other allied species, however, by the thorax not being narrowed behind; the pronotum is also more coarsely and less closely punctured toward the middle, the erect hairs are here more truly scales, the pygidium is more coarsely punctured, the tibiæ less stout, the front tarsi shorter and the mentum more deeply concave. The peculiar concave compression of the tarsal joints is not closely approached by any other species known to me.

Lachnosterna carolina, n. sp.

Moderately elongate, cylindrical, entirely rather pale rufo-testaceous, surface moderately shining. Clypeus broadly feebly emarginate, moderately reflexed, surface closely punctate, the front a little less densely so.

Prothorax fully twice as wide as long from a vertical view point, sides parallel posteriorly, accurately narrowed in front, margin entire, surface moderately closely, not coarsely, punctate. Elytra as closely and somewhat more coarsely punctate than the prothorax, costæ faint. Pygidium vaguely finely punctate and with a tendency to become longitudinally wrinkled. Metasternum closely punctate, hairs short and not dense. Abdomen finely sparsely punctate, nearly smooth at middle. Last joint of maxillary palpi fusiform ovate, slightly impressed.

Length 14-15 mm.; width $7\frac{1}{2}$ - $8\frac{1}{2}$ mm.

Male.—Antenna 10-jointed; club a little shorter than the stem; abdomen slightly flattened at middle, penultimate segment faintly sinuate at middle and with a slightly roughened arcuate impression which anteriorly attains the middle of the segment, and is about twice as wide as long; last segment with a shallow subrectangular emargination, the apical limiting angles not produced or acute, the bottom of the emargination feebly roughened on its extreme edge; surface of the segment with a transverse polished fovea occupying the entire length; inner spur of hind tibia short, varying from $\frac{1}{10}$ to $\frac{1}{4}$ the length of the long and slender outer spur.

This species is very closely allied to *ephilida*, which it resembles perfectly in all the more obvious characters. The latter, however, has a slightly longer antennal club, the abdomen in the male is distinctly channeled or concave at middle, the penultimate segment more evidently roughened posteriorly, the last segment more deeply emarginate, the lateral lobes more prominent, the posterior border of the emargination more widely and strongly roughened, the genitalia quite different, though of a similar type.

Described from five examples—all males—taken at Southern Pines, N.C., by Rev. A. H. Manee, the dates of capture ranging from June 14 to July 15.

Microphotus rinconis, n. sp.

Oblong, prothorax testaceous, the disk rather broadly infuscate, elytra fuscous, under surface and appendages testaceous. Antennæ (δ) 8 or 9 jointed. Prothorax about $\frac{1}{4}$ wider than long, sides parallel posteriorly, arcuately narrowed in anterior half, the apex subangularly rounded; surface dull, coarsely reticulate punctate in front, somewhat less so behind, especially on the convex median portion of the disk, the latter neither channeled nor carinate. Elytra a little more than twice as long as the

prothorax, subparallel, rather coarsely but vaguely punctate, costæ variable in distinctness.

Length 6.1-6.6 mm.; width 2-2.4 mm.

Rincon Mts., Southern Arizona (Beyer).

M. octarthrus, n. sp.

Nearly similar to the preceding, the elytra and median parts of the prothorax fuscotestaceous. Antennæ 8-jointed. Prothorax but slightly wider than long, sides feebly obliquely convergent behind. Elytra a little shorter with sides more evidently arcuate in some specimens, the punctuation dense, rather coarse and better defined than in the preceding.

Length 4.75-5.3 mm.; width 2 mm.

Rincon Mts., Arizona (Byer).

Var. *pecosensis*, n. var.

Under this name I include as a variety or race of the above a series of four examples from Pecos, New Mexico, taken by Prof. Cockerell. They differ from the typical form by their larger size (5.5-6.6 mm.), relatively longer elytra, somewhat larger eyes and slightly less stout antennæ. One specimen is anomalous in its shorter elytra and is probably aberrant; it has, however, deterred me from describing this as a distinct species. This species or subspecies* was recorded as *angustatus* in the New Mexico List, following LeConte's determination of Colorado specimens, which are probably the same thing.

M. decarthrus, n. sp.

Elongate, parallel, prothorax distinctly, elytra moderately shining, colour as in the preceding species. Antennæ 10-jointed. Prothorax slightly wider than long, sides a little more convergent behind, apex narrowly subtruncate at middle, surface shining, the punctures of different sizes, but as a whole finer, shallower and distinctly separated; median line channeled posteriorly. Elytra narrow, parallel, more than three times as long as the prothorax, punctuation close but vague and rather fine; costæ evident.

Length 6.6 mm.; width 2.2 mm.

Chiricahua Mts., Southern Arizona. A single specimen collected and given me by Mr. V. L. Clemence, of Pasadena, California.

The five species of *Microphotus* known to me may be easily separated by the following table, the characters of course pertaining to the males only:—

Elytra suboval, distinctly rounded on the sides *dilatatus*.

Elytra parallel, sides straight or but little rounded.

Prothorax not narrowed behind.

Prothorax semielliptical, widest at extreme base; elytra $2\frac{2}{3}$ to 4 times as long as the prothorax, brownish testaceous frequently with a pinkish tinge *angustatus*.

Prothorax with sides parallel posteriorly; elytra $2\frac{2}{3}$ to 3 times as long as the prothorax, fuscous in colour *rinconis*.

Prothorax obliquely narrowed behind, widest at about the middle.

Antennæ 8-jointed, prothorax more coarsely and densely reticulate punctate, less shining, the median line carinate or subcarinate posteriorly *octarthrus*.

Antennæ 10-jointed, prothorax more sparsely punctate and shining, median line sulcate posteriorly. *decarthrus*.

So far as known, *dilatatus* is confined to the Cape region of Lower California. *Angustatus* occurs in and to the west of the Sierras from Southern California to Oregon.

There is a confusing disagreement in published references to *Microphotus* as to the number of antennal joints. LeConte, in the original diagnosis of the genus (based on *dilatatus*), describes these organs as 11-jointed. In his subsequent description of *angustatus* they are said to be 9-jointed. Later, in his synopsis of the Lampyridæ, the number of joints is given in the generic table as nine in the male and eight in the female, but in the remarks upon the genus which follow on the same page the males are said to have 10 and the females 9-jointed antennæ. The small subulate appendage to the terminal joint was evidently counted by LeConte in the original description, but not afterwards. So far as my material goes *decarthrus* alone has 10-jointed antennæ; of my three examples of *dilatatus* one has three organs 9-jointed, another 8-jointed, the outer joints being lacking in the third. In both specimens of *rinconis* the antennæ are evidently 8-jointed when viewed from the front, but there is a more or less complete division of the sixth joint on the lower and posterior sides so that viewed from that position they appear to be 9-jointed. In the eight examples of *octarthrus* the antennæ are uniformly 8-jointed, while in *angustatus* they are as constantly 9-jointed. The following measurements in millimeters of the length and width of the prothorax and the length of the elytra exhibit considerable variation, but the deduced ratios

are in most cases sufficiently different to be distinctive. No measurements of width of elytra are recorded, the tendency to warp, curl and separate when dry rendering them unreliable for comparative purposes.

	Length of Prothorax	Width of Prothorax	Ratio of Length to Width of Prothorax	Length of Elytra	Length of Elytra in Terms of Prothorax
<i>dilatatus</i>	2.30	2.95	.75	5.80	2.52
".....	2.38	3.00	.76	6.40	2.69
".....	1.78	2.25	.79	4.75	2.67
<i>rinconis</i>	1.85	2.20	.82	4.83	2.68
".....	1.51	1.82	.83	4.60	3.05
<i>octarthrus</i>	1.50	1.53	.98	5.10	3.40
".....	1.40	1.50	.93	4.75	3.39
".....	1.50	1.60	.94	5.00	3.33
".....	1.55	1.70	.91	4.00	2.58
<i>var. pecosensis</i>	1.50	1.62	.93	3.40	2.27
".....	1.60	1.70	.94	3.55	2.22
".....	1.40	1.52	.92	3.35	2.39
".....	1.60	1.60	1.00	3.70	2.31
<i>decarthrus</i>	1.60	1.70	.94	5.00	3.13
<i>angustatus</i>	1.50	1.76	.85	5.95	3.97
".....	1.50	1.75	.85	5.50	3.67
".....	1.88	2.20	.85	7.00	3.72
".....	1.34	1.50	.89	4.75	3.54
".....	1.60	2.00	.80	6.25	3.91

Ammodonus granosus, n. sp.

Broadly oval, moderately convex, dull black, densely clothed above with appressed ash coloured scales varied with brownish, and with numerous short subrecumbent squamiform hairs which on the elytra are arranged subseially in great part; beneath with sparse appressed narrow scales or scale-like hairs, side margins of the body fimbriate with short feebly clavate squamiform hairs. Head and prothorax with numerous naked granules which are separated by about their own diameters on the head and anterior parts of the prothorax, a little less close toward the base of the latter. The prevailing colour of the scales is ashy, feebly nubilously varied with pale brown at the middle of the basal and apical parts of the pronotum; elytra with a uniformly slightly brownish shade along the suture, exterior to which is a fuscous basal spot and an irregular transverse median spot, and behind the latter and nearer to the suture than to the side margin, an elongate oblong spot of same colour.

Length 5 mm.; width $2\frac{3}{4}$ mm.

Rincon Mts., Southern Arizona.

Three examples of this interesting species were taken by Mr. G. Beyer, from one of which the above description is drawn. It is evidently

closely related to *A. fossor*, but differs notably in its conspicuously granulose head and pronotum, slightly wider head, less transverse prothorax— $\frac{3}{5}$ as long as wide—(about $\frac{1}{2}$ as long as wide in *fossor*) more pronounced elytral markings and stouter front tibiæ with broader apical process. In *fossor* there are a few small granules on the head and pronotum, but these are discernible with difficulty, being nearly or quite concealed by the vestiture in all specimens I have seen.

I find it impossible from description to distinguish between *Ammodonus* and the genus *Scaptus* as defined in the "Biologia." *Scaptus tropicus* Kirsch, widely distributed over the central portions of the American continent and the adjacent islands, must be closely allied to the present species, and perhaps still more closely to *fossor*.

Supplementary Note on Microphotus.

Since sending the MS. of the present article to the publisher, Mr. A. B. Wolcott, of the Field Museum, of Chicago, has called my attention to some remarks on *Microphotus*, including the description of a new species, by Ernest Oliver, in the Revue Scientifique du Bourbonnais et du Centre de la France—1911, No. 3, p. 79. The author calls attention to the discrepancies in LeConte's writings as to the number of antennal joints, which I have alluded to above, and says that in all ♂s seen by him—excepting the new species about to be described—the antennæ are 9-jointed. This new species has 10-jointed antennæ and is described as follows:—

"*M. robustus*, n. sp.—Pallide testaceus, elongatus, antennis decem-articulatis; prothorace supra caput rugose et profunde punctato, lateribus leviter attenuatis, antice rotundato, basi vix sinuato, angulis rectis, carinate, pallide testaceo, macule parva basali rubescente; scutello testaceo, triangulari; elytris elongatis, subparallelis, fuscis, rugosis, obsolete costulatis, prothorace haud latioribus, apicem versus attenuatis; ♀ ignota. Long. 12 mill.—San Diego.

"Bien distinct des autres espèces par sa taille beaucoup plus grande, ses antennes de 10 articles, son prothorax court, atténué, à sommet bien arrondi, ses élytres acuminés, plus long que l'abdomen et un peu déhiscent à partir de la moitié de leur longueur, etc."

Where San Diego is we are not informed, but presumably in California. The size is much greater than in any species of the genus known to me, being nearly double that of *decarthus*, which alone agrees with *robustus* in the number of antennal joints.

NOTES ON THE CHALCIDOID *TRICHAPORUS* FOERSTER
OF THE FAMILY EULOPHIDÆ, WITH DESCRIPTION
OF ONE NEW NORTH AMERICAN
FORM FROM ILLINOIS.

BY A. ARSÈNE GIRAULT, BRISBANE, AUSTRALIA.

History and Description.

Arnold Foerster in 1856, in his "Hymenopterologische Studien," designated as follows a group of generic rank called *Trichaporus*, which had no species named in connection with it. Quoting the table of genera given under his family Tetrastichoidæ we find the following omitting those portions of the table having no relevancy:

- "a. Das Schildchen ohne Furchen.
- b.* Fühler scheinbar dreigliedrig *Triphasius m.**)
- bb.* Fühler deutlich mehrgliedrig.
- c.* Flügel ohne ramus stigmaticus *Anoxus m.**)
- cc.* Flügel mit einem ramus stigmaticus.
- d.* Der ganze Flügelrand mit langen Wimperhaaren
 besetzt *Pterothrix* Westw.
- dd.* Der Vorderrand des Flügels ohne längere
 Wimperhaare *Trichaporus m.***)
- aa.* Das Schildchen mit Furchen versehen.
- e.* Der Schaft übermässig verdickt (♂).
- f.* *Ceraninus* Walk.
- ff.* *Baryscapus m.****)
- ee.* Der Schaft nicht übermässig verdickt.
- g.* (.)
- gg.* *Hyperteles m.†*)
- *Tetrastichus* Hal."
- pp. 83-84.

In the last paragraph of the next page (p. 85), Foerster stated in regard to the group *Trichaporus*: "Eine gleiche Bewandniss hat es mit der Gattung *Trichaporus*. Von *Pterothrix* wird sie in gleicher Weise durch achtgliedrige Fühler beim ♂ und ♀ geschieden. Dazu kommt, dass die siebengliedrigen Fühler des ♂ von *Pterothrix* mit langen Haaren

a. The footnotes are omitted, with one exception—A.A.G.

***) *Trichaporus* von δειξέ, τεῖχος, ἦ und ἄπορος or, arm, dürftig Im Vergleich zu *Pterothrix* erscheint der Flügel arm an Wimperhaaren.

bekleidet sind, grade so wie bei den ♂ von *Tetrastichus*, bei *Trichaporus* aber sind sie ganz kurz und gleichförmig behaart. Der Flügel weicht ebenfalls von *Pterothrix* ab, indem er gleich *Anozus* am Vorderrande nur einen kurzen Haarsaum hat. Der deutliche ramus stigmaticus gibt aber auf der anderen Seite wieder ein gutes Unterscheidungsmerkmal der Gattung *Anozus* gegenüber ab."

Hence the group was originally defined as tetrastichines, having 8-jointed antennæ in both sexes, without a ring joint, and with uniform short hairs, the scutellum without furrows, the fore wings with a stigmal vein, but without long cilia on the cephalic margin.

Foerster gave nothing more concerning the genus; no species was mentioned as belonging to it; under the code it is therefore without status. Notwithstanding this, Taschenberg (1866) recognized the group, as did also de Dalla Torre (1898), the latter, however, placing it among the "Genera Sedis Incertæ" of the subfamily *Tetrastichinæ*, with the comment "Species exstat."

In 1904 Ashmead took the name and applied it to a group of his own species and one of Philippi's (1873), still quoting Foerster as responsible for the name, and stating that the type was unknown but giving a wholly different definition of the genus. Several years earlier Ashmead (1900) removed *Euderus columbianus* Ashmead to *Trichaporus* Foerster, thereby recognizing the latter. This species can not become the type of the genus, since Ashmead in 1904 defined the genus with characters which *columbianus* does not possess. *Trichaporus* Foerster, 1856, being non-existent, the group *Trichaporus* defined by Ashmead in 1904, and referred to Foerster, 1856, should become a *genus novum* Foerster without designated type. For the latter purpose I select *Trichaporus melleus* Ashmead, 1904, being one of the species upon which the definition of the genus was evidently based, and the first one described by Ashmead in 1904. (*Exurus*) *Trichaporus colliguaye* (Philippi, 1873) is the first species listed by Ashmead in 1904, but this is not selected as the type of the genus because of the fact that it may not have been actually seen by him, and its reference to this genus is, I believe, somewhat doubtful. I retain the original spelling of Foerster—*Trichaporus*.

The genus has no synonyms, unless *Exurus* Philippi, 1873, should prove to be such. It is true that Ashmead (1904, p. 374) designated *Euderus* Thomson (*sic*) (1878, p. 276) to be a synonym of *Trichaporus* Foerster, 1856. But in the first place the latter was non-existent, and secondly, Thomson never described a genus called *Euderus*, but distinctly

(in the place cited) quotes Haliday as being responsible for the group, in fact as he was. *Euderus* Haliday has little in common with *Trichaporus* Foerster.

The characters of the new genus, extracted from the key of the Tetrastichini as given by Ashmead (1904, pp. 348-349), are as follows: Tetrastichines with a sessile cylindrical abdomen as long as, or longer than, the thorax, and convex above (dorsad), a slender marginal vein in the hind wings, the mesonotum without a median groove, the pronotum not conical, the antennæ 9- or 10-jointed with one or two ring-joints, the scutellum with four (or two?) longitudinal grooved lines, the metanotum usually punctate, and the head, thorax and abdomen punctate or shagreened; the fore wings with short marginal fringes, the hind wings not acutely pointed at apex and the segments of the abdomen subequal in length. The genus is closely related to *Tetrastichodes* Ashmead on the one hand and to *Syntomosphyrum* Foerster on the other.

Ashmead always spelled the name *Trichaporus* instead of *Trichaporus*; as stated, I have adopted the latter as being correct.

The genus as it now stands contains six species, two of which (*colliguayæ* and *columbianus*), however, are more or less doubtfully placed. I have been unable to gain access to the types of any of the species.

Host Relations.

The habits of the parasites of this genus are not well known. In fact, in no case is there a definite record of the host of any one species, and but three of the species have been in any way connected with hosts. *Trichaporus columbianus* (Ashmead) is stated by Smith (1900) to live in cecidomyid galls; *colliguayæ* (Philippi) was reared in large numbers from a gall on *Colliguaya odorifera* Molina in Chile, but under circumstances which would necessitate confirmation of this gall-forming habit; it is possible that the gall was cecidomyid, and the species parasitic on the latter; *æneoviridis* was reared under conditions which make it impossible to decide whether it is parasitic on an ichneumonid, a syrphid or a larva of a lasiocampid moth. Nothing definite can therefore be stated in regard to the host relations of the genus.

Distribution of the Genus.

The species of the genus *Trichaporus* as now known are restricted to the Western Hemisphere, and the majority of the species belong to South America; *melleus* Ashmead, *viridicyaneus* Ashmead, *Persimilis* Ashmead

are known from Brazil only; *colliguayæ* (Philippi) from Chile. The North American species are: *columbianus* (Ashmead) [Florida, District of Columbia, New Jersey]; and *æneoviridis* Girault (Illinois). Of the six species of the genus, four are South American and two North American, and the genus as a whole is distributed between the meridians of 40.6° and 89.2° west longitude, and between the parallels of about 40° south and 42° north latitude.

(To be continued.)

NEW SPECIES AND GENERA OF NORTH AMERICAN LEPIDOPTERA.

BY WM. BARNES, M.D., AND J. H. MCDUNNOUGH, PH.D., DECATUR, ILL.

(Continued from page 22.)

Leucania suavis, sp. nov.

Head and thorax clothed with olivaceous-hair; primaries straw-coloured, slightly sprinkled with black atoms, especially along inner margin; a dark shade extends from base of wing above cubital vein and along vein 5 to outer margin; veins in outer portion of wing finely lined on both sides with dusky; an indistinct oblique row of black dots across the wing beyond the cell, not attaining costa; a faint row of black marginal dots, mostly incomplete; fringes whitish. Secondaries deep smoky in ♂, fringes pale, cut by a dark line; in ♀ smoky, but much lighter than in ♂, an incomplete row of terminal dots and pale fringes without dark line. Beneath primaries smoky, outer margin and a ray extending outwards from discocellular vein pale straw-colour; secondaries pale, slightly suffused with smoky; a small discocellular spot and incomplete row of terminal dots on each wing. Expanse, 31 mm.

Habitat: White Mts., Ariz., 1 ♂, 6 ♀s. Type, collection Barnes.

Our single ♂ specimen shows a black dot at the inception of vein 2 of primaries, and another below it on anal vein; these are lacking in the ♀s. The species may easily be separated from all other N. Am. species of the genus *Leucania*, as defined by Hampson, by the fact that there are no black lines in the interspaces of the veins in the terminal area.

Trachea cara, sp. nov.

Palpi blackish outwardly; head and thorax clothed with an admixture of reddish-ochreous and black scales; an indistinct black transverse line on tegulæ and a rather more distinct black line before upper margin

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of patagia. Primaries purplish-red, suffused with ochreous; a black basal dash extending to t. a. line; basal line only indicated by a slight dark mark on costa, surrounded by diffuse ochreous shading; t. a. line indistinct in costal half of wing, indicated by two spots on costa, below basal dash distinct, geminate, black, filled with ochreous, and bent inwards to inner margin near base; beyond t. a. line considerable ochreous shading, especially along inner margin; orbicular round or slightly oval, outlined partially in black, with ochreous annulus and smoky central portion; claviform a slight black arrow mark below orbicular, not extending back to t. a. line and preceded by ochreous shading; reniform large, constricted centrally, the lower portion considerably broader than the upper, outlined in black, with dark centre; a slight dark median shade angled at reniform; t. p. line indistinct in costal portion, geminate, black, the inner line most distinct, filled with ochreous, outcurved around reniform, almost touching same at base, from which point it is evenly oblique and slightly lunate to inner margin; space between it and reniform shaded with ochreous; several pale dots beyond on costa; subterminal space even purplish-red, with little ochreous shading; s. t. line pale, wavy, crossed by two black sharply defined lines above and below vein 5, reaching from outer margin almost to t. p. line; terminal space with less reddish than remainder of wing, crossed by black line below vein 7, and with faint black mark on vein 2, neither of these crossing subterminal line; a terminal series of small black lunules; fringes dusky, streaked with ochreous opposite veins; secondaries smoky, with an incomplete dark terminal line; fringes smoky, with slight pinkish tinge, cut indistinctly by a darker line. Beneath smoky, with slight pinkish tinge, traces of a medial line on primaries mostly confined to costal area, distinct medial line and discal dot on secondaries. Expanse, 32 mm.

Habitat: Eureka, Ut.; Provo, Ut., 2 ♂s, 1 ♀. Type, collection Barnes.

Very similar in maculation to *T. adnixa* Grt., but lacking the blackish mark in subterminal area below vein 2, which is mentioned by Hampson (Cat. Lep. Het., VII, 187) in his description, and is also present in a coloured drawing of the type in the Tepper collection, which we possess. We have several specimens from Vanc. Is., B. C., which we take to be *adnixa*, and which are generally darker in ground colour, with a more prominent light patch beyond reniform; the black lines on each side of vein 5 are also not so clearly cut in the B. C. specimens, tending to

become suffused with each other, and the s. t. line is more prominent and distinct.

Hadenella cervoides, sp. nov.

Palpi outwardly dark brown, scaled with white at base, upturned, third joint short, porrect, antennæ ciliate; front and thorax closely scaled with brown and pale scales; divided scale tuft on metathorax; primaries brown, ordinary lines wanting, two black spots on costa above orbicular and reniform indicating their position, and a faint pale shade-line beyond reniform giving the approximate course of t. p. line; orbicular and reniform small, outlined in white, former round, latter kidney-shaped and open towards costa; faint terminal row of black dots, preceded by much more distinct pale ones, from the inferior one of which a slight black dash extends inwardly; fringes long, dusky, cut by a darker line. Secondaries smoky; fringes whitish, cut by a broad dark shade; beneath smoky brown, secondaries white at base and inner margin. Expanse, 25 mm.

Habitat: Redington, Ariz, 1 ♂. Type, collection Barnes.

The generic reference is doubtful; the front has a small truncate prominence, with raised edges and slight central process, but as the abdomen is devoid of squamation we are unable to tell whether tufts are present or not; in general appearance it fits in very well with *pergentilis*. We thought at first this might be *Fotella notalis* Grt., but as far as can be judged by Grote's rather meagre description, combined with Hampson's remarks, this is a larger species (34 mm.), without orbicular, and with a pale terminal border.

Perigea orta, sp. nov.

Palpi ochreous, sides of 2nd joint and 3rd joint dark brown; front ochreous, shaded posteriorly with dark brown; base of tegulæ ochreous, bordered with a dark line; remainder of head and thorax clothed with an admixture of reddish, ochreous and dark brown scales; abdomen yellow-brown, with darker tufting; primaries dark brown, with a distinct reddish tinge; maculation indistinct; basal line represented by two dark streaks on costa, with intermediate space filled with olive; t. a. line geminate, inner line obsolete, filled with olive shading, slightly oblique in course, dentate, a small inward angle below costa, prominent ones in the cell and on vein 1; orbicular small, round, partially outlined in black, filled with olive; claviform, when present, a small blackish blotch resting on t. a. line, and occasionally filled with olive; reniform large, the lower portion filled with a prominent quadrate white patch shaded inferiorly with black,

the upper portion filled with several irregular olive spots and dashes, separated from each other by dusky shades; above reniform on costa a small olive dot; t. p. line indistinct, broken, represented by a series of olive spots, shaded inwardly more or less distinctly with black sagittate marks, and followed by a row of minute white dots on the veins; in course parallel to outer margin, slightly incurved in submedian fold; s. t. line usually very indistinct, marked by the difference in shade between the dark subterminal and the ochreous shaded terminal spaces, irregular, incurved opposite cell, dentate on veins 2-4, occasionally preceded by black sagittate marks, most prominent in costal half; terminal area usually but slightly lighter than subterminal portion; at times rather heavily streaked with ochreous; a dark terminal line, broken by yellow points opposite the veins; fringes dark, rayed with ochreous or olive opposite the veins. Secondaries entirely smoky, with broken dark terminal line. Beneath primaries smoky, costa and outer margin ochreous, shaded with pinkish; secondaries whitish, sprinkled with smoky; a more or less evident discal spot and postmedian line on both wings. Expanse, ♂ 23 mm.; ♀ 28.5 mm.

Habitat: Gila Co., Ariz. (2 ♂s, 5 ♀s); Redington, Ariz. (1 ♂, 2 ♀s); Santa Catalina Mts., Ariz. (1 ♀). Types, collection Barnes.

The species bears considerable resemblance to *vecors* Gn., is, however, much smaller, lighter in appearance, and differs in the marking of the reniform, as well as in other minor details; it shows considerable variation as regards the distinctness of the subterminal line and the shading in terminal space. It is possibly Mexican, but we can find nothing in Hampson's work that agrees with it.

Oligia (Hadena) tonsa ab. *fasciata*, ab. nov.

Maculation as in *tonsa* Grt., or *subjuncta* Sm.; the ground colour of the wings, however, is white, streaked slightly with blackish; a broad red-brown band stretches across the median area of wing, bordered inwardly by the t. a. line, outwardly in the upper portion by the inner margin of the reniform, in the lower portion by the curved t. p. line; in the basal area of wing, near inner margin, two short black streaks, and a black dash across the median band as in *tonsa*; orbicular and reniform white, former very prominent against the dark surrounding area, latter with a slight yellowish outer shading between it and t. p. line. Secondaries deep smoky. Expanse, 22 mm.

Habitat: Eureka, Ut., 1 ♂. Type collection, Barnes.

This very striking form we received, along with a number of ordinary *tonsa*, from Mr. T. Spalding. As it agrees exactly in the course of the lines and general maculation with these specimens, we prefer to regard it for the present as an aberration, although it may prove to be a good species.

Athetis (Caradrina) moua, sp. nov.

Palpi outwardly black, 3rd joint pale ochreous; head and thorax gray, latter slightly paler; primaries very even dark gray-brown, with a sprinkling of black scales; t. a. line fine, black, slightly broken, originating from a black spot on costa; wavy and somewhat outwardly inclined; orbicular a small dark spot; reniform large, concave towards apex of wing, the concavity outlined in yellow, basal half outlined with white dots, 4-5 in number, central portion very slightly darker than rest of wing; on costa above reniform a dark spot; a faint dark median shade; t. p. line faint, crenulate, evenly sinuate; s. t. line barely visible, pale ochreous, irregular; terminal area slightly darker than remainder of wing; indistinct dark broken terminal line bordered outwardly with paler. Secondaries white, with broad outward dusky suffusion and dark terminal line, fringes pale, cut by a dark line near base. Beneath primaries wholly smoky, with faint discal dot and traces of postmedian line; secondaries white, sprinkled with brown along costa and outer margin, with distinct discal dot. Expanse, 22 mm.

Habitat: Witch Creek, San Diego Co., Calif., 1 ♀. Type, collection Barnes.

A species resembling certain forms of the European *selini* rather than any American species known to us; *multifera* Wlk. is probably its closest ally.

Papaipema errans, sp. nov.

Head and thorax purplish-brown, sprinkled slightly with white; tegulae tipped with white; primaries purple-brown, sprinkled with white and suffused with golden-yellow, which is particularly prominent along inner margin to t. p. line and in terminal space; all maculation dull and indistinct; t. a. line only distinguishable as a fine dark line crossing the yellowish area near inner margin; above this two oval dark shades represent claviform and orbicular; a dark median shade with prominent outward angle on cubital vein, inwardly oblique from below reniform to near t. a. line; t. p. line fine; rigid, inclined slightly outward from reniform to inner margin, separating gradually from median shade, and approaching

subterminal line; beyond it on costa several pale dots; reniform an obscure, dark, figure-of-eight shade; subterminal area lighter and more evenly purplish than remainder of wing; s. t. line marked by difference of shade between subterminal and terminal areas, shaded inwardly with smoky brown; terminal area with golden tinge; fringes dark. Secondaries smoky, paler basally, with obscure discal mark; beneath smoky, with discal dots and obscure postmedian lines on both wings. Expanse, 26 mm.

Habitat: White Mts., Ariz., 1 ♂. Type, collection Barnes.

Related to *unimoda* Sm., but the t. p. line is not lunulate, and is distinctly bent outward towards inner margin.

Too late to avoid publication we learn that in the foregoing article on "New Species and Genera of Lepidoptera" we have in two instances created a synonym. Our species *Hudenella cervoides* proves to be *Caradrina fragosa* Grt.; Dr. Barnes has just recently compared the two types. Our new genus and species *Friesia anormalis* is Grote's *Prosoparia perfuscaria*, placed at present in the *Geometridæ*. Mr. J. A. Grossbeck has sent us a specimen compared with the type, remarking at the same time that it is a Noctuid; we are glad to find our opinion supported by such a good authority, and trust that our figures of the structural features may serve to elucidate and augment Grote's very meagre and inadequate description.—J. H. McDUNNOUGH.

FURTHER NOTES ON DIABROTICA.

No. III.

BY FRED. C. BOWDITCH, BROOKLINE, MASS.

(Continued from page 16.)

D. quadrinotata, nov. sp.

Head black; antennæ long, black, joints 9-11 flavous, except extreme tip of last. Thorax wider than long, flavous, shining, finely sparsely punctulate, trifoveate, nearly straight on sides, angles all acute; scutellum black; elytra somewhat dilated at rear, thickly finely punctate, light pale flavous, each elytron with two small black spots, a humeral or subhumeral and a submedian. Body beneath black, legs black, femora flavous, under side of thorax flavous. Length, 8 mm.

Two examples, Peru, green label (Marcapata?).

The antennæ are nearly as long as the body (♂), or shorter than the body (♀); joint 3 nearly as long as 4; head with a deep fovea. The

thoracic fovea are well marked and connected by a well-marked depression, and one example has a median piceous mark at the rear. The elytra are much wider than the thorax, convex, very thickly punctured, almost obsolete granular, the black spots relatively small but very conspicuous. Somewhat similar in shape and appearance to *7-punctata* Jac. from Parada, Mex.

D. bicincta, nov. sp. (Jac. in litt.).

Head black; antennæ black, last 3 joints (δ ?) or 4 joints (φ ?), flavous, except tip of 11. Thorax punctured, flavous, trifoveate; scutel black; elytra thickly and rather coarsely punctate, flavous, a broad basilar and somewhat narrower submedian fascia dull black, neither quite attaining the margin. Thorax beneath and mesosternum flavous, rest of body black, legs black with yellow femora. Length, $4\frac{1}{2}$ -5 mm.

Five examples, Marcapata, Peru.

This form has been distributed with the manuscript name *bicincta* Jac. Four co-types have been sent me by Messrs. Staudinger & Bang-Haas. It is a pretty little species, and easily recognized by the two black fasciæ. The antennæ are long and slender, and nearly equal to the length of the body in the δ . The apparent difference in the number of white joints may be significant of similar variation in other so-called species. The elytra are depressed near the scutel and not at all plicate; in one example the suture is very narrowly black between the bands. One example has the rear band abbreviated into two spots, the anterior band much narrowed, and joint 8 of the antennæ half black and half white.

D. parambaensis, nov. sp.

Head rufous; front in the δ profoundly excavate concave, in the φ convex; antennæ flavous, fuscous at tip, joint 2 very short, 3 several times longer than 2 in the δ , stout, *curved*, and a trifle longer than 4; in the φ relatively shorter, equal to 4 and *both joints* cylindrical. Thorax rufous, polished, *distinctly punctulate*, deeply bifoveate and obsolete depressed before the scutel, which is black; elytra shining black, punctured subseriately on the disk, becoming obsolete behind, the tip moderately, and a narrow median fascia bright, yellow. Thorax below red and black, body black, edges of the segments narrowly flavous, legs bright yellow, extreme tip of tarsi fuscous.

Var. A with small yellow subbasal median dot.

Six examples of typical form, "Paramba 3500 iv; '97," dry season (Rosenburg); 14 examples from Cachabé seem the same, though smaller,

and with the upper flavous marks occasionally joined along the margin. Length, $5\frac{1}{2}$ -7 mm.

Seems close to *excelsa* Baly (which I have not seen), but that species is said to have the thorax *impunctate* and the elytra obsoletely "elevato-vittatis," and the length is $9\frac{1}{2}$ mm. Curiously enough, the description of *excelsa* does not mention the shape of the third antennal joint, except inferentially in the statement, "the fourth cylindrical, not curved." The curved third joint in the ♂ of *parambaensis* is very marked, and allies it closely to the Central American forms, *lepida* Say and *variabilis* Jac. It seems to indicate a tendency towards the dilated joint of the ♂ of *Ceratoma*. All the forms in Baly's paper, sec. K, with concave front in the ♂, are represented in my collection, with the exception of *excelsa* Baly. The forms *imitans* Jac. (type in my collection) and *deliciosa* Baly have a very strong tendency to run together.

In *parambaensis*, the entire front is occupied in the ♂ by the concavity, which is very deep; the antennæ are about half as long as the body, and if the small second joint is bent to a particular angle it pushes up a supplemental hinge, which appears at first sight like a small joint. The thorax is wider than long, sinuate and angled behind; the lateral fovea oblique and deep, and a distinct antescutellar depression is present; punctuation fine, but perfectly distinct; elytra with the usual shape of species of this section, quite strongly punctate, subseriately on the disk, becoming obsolete behind, transversely depressed behind the scutel and subplicate. The Cachabé specimens, as a rule, are smaller and with smoother elytra. Apparently a common form. The species of this section K need large series to determine the species, and even then it is difficult.

D. stuarti, nov. sp.

Head yellow; mouth black; antennæ yellow, tip of last joint dark. Thorax yellow, bifoveate; scutel blackish rufous; elytra thickly and rather coarsely punctate, yellow, with the rear part nearly to the middle semi-shining blue-black. Beneath yellow, with metasternum and abdomen black; legs yellow, tibiæ and tarsi and apex of femora dark fuscous.

Two examples, San Augustin, Mapiri, 3,500 feet, Sept. 1896 (M. Stuart). Length, 10 mm.

Belongs to sec. M, and should be placed near *dimidiata* Baly. Head with front distinctly carinate, antennæ reaching to just within the black

apex of the elytra, with joints 3 and 4 nearly equal; thorax transverse, margined, all the angles acute, sparsely, finely and evenly punctate. The elytra are slightly dilated at rear, just a trifle more than in *prodiga* Er., and not as much as in *dimidiata* Baly. The rear tibiae are rather darker than the others. The only one of its large allies having a black scutel is *prodiga* Er.

D. haenschi, nov sp.

Head rufous flavous; mouth-parts piceous; front carinate; antennae black, with extreme base rufous. Thorax transverse, shiny, rufous flavous bifoveate, depressed, with all the angles prominent and a few scattered punctures; scutel rufous; elytra dilated behind, thickly and almost rugosely punctured, especially behind; yellow, with the rear half black. Below, thorax and mesosternum yellow, remainder black, legs black, with base of femora rufous. Length, $5\frac{1}{2}$ -6 mm.

Type, Balzabampa. Ecuador (R. Haensch); also Sn. Inez, Ecuador.

Belongs to sec. M, and comes nearest to *atriventris* Jac., from Ecuador, but is easily distinguished by the black legs.

The antennae are long and slender, and reach nearly to the tip of the elytra. The Sn. Inez example is much less rugosely punctured than the type.

D. marcapa, nov. sp.

Head, thorax, antennae, scutel, rear half of the elytra, body beneath and legs black, with a faint tinge of green on the thorax; anterior half of the elytra bright rufous; thorax with three deep fovea, and distinctly though sparsely punctate; elytra thickly and coarsely punctured, becoming obsolete at the rear. Length, 7 mm.

One example, Peru, green label (Callanga?), Jacoby collection.

This species should be placed in sec. M, though the form is more like that of some of the species of sec. L. Head with carinate front and hairy, especially in front of the eyes; thorax strongly transverse, margined, with oblique lateral fovea, the rear round and just in front of the scutel; the elytra only slightly dilated behind. The antennae are about three-fourths the length of the elytra, and joint 3 is not quite as long as 4. The extreme base of the femora is piceous. The tibiae are noticeably covered with sericeous hairs.

D. cyaneo-maculata, nov. sp. (Jac. in litt.).

Head and thorax yellow; antennæ, except the extreme base, black. Thorax bifoveate and depressed; scutel yellow; elytra yellow, slightly dilated at the rear thickly, coarsely and subseriately punctured, with a large cyaneous blue spot occupying the whole apical third, leaving the extreme margin narrowly flavous to the tip. Body beneath paler yellow, legs yellow, with tibiæ, tarsi and upper surface of apex of femora black. Length, $5\frac{1}{2}$ mm.

Five examples, Callanga, Peru.

This species has been distributed with the manuscript name *cyaneo-maculata* Jac. Of what purport to be three co-types sent me by Messrs. Staudinger & Bang-Haas, two belong to a different genus. The antennæ attain the apical spot; joint 3 a trifle shorter than 4. The thorax is finely but obviously punctulate, while the elytra show here and there fragments of smooth lines between the punctures. In one of the specimens the apical spot includes the side margin, in the typical form it does not.

D. cyaneo-plagiata, nov. sp.

Head yellow; mouth-parts dark; antennæ black, piceous at base, joints 9-11: flavous, with extreme tip of last dark. Thorax flavous, bifoveate, a sublateral dark streak on each side, not attaining either edge; scutel flavous; elytra flavous rufous, dilated behind, coarsely thickly punctured, with a common apical cyaneous blue spot, which does not attain either the side or apex. Body beneath flavous, legs flavous, with apex of femora and tibiæ and tarsi black. Length, $4\frac{1}{2}$ mm.

One example, Peru, green label (Callanga?).

Superficially like *cyaneo-maculata*, but the light joints of the antennæ and the black streaks of the thorax at once separate it. The elytral spot is smaller; the elytral punctuation is coarse, subseriate in the disk, and becomes obsolete behind and at the sides.

A CORRECTION.

From the description of *Gnorimoschema septentrionella*, in the December number, p. 422, some words have been left out. The description of the hind wing of the insect should read: *Hind wing* dark grey—dries with a gloss. Fringe lengthening towards the body to $3\frac{1}{2}$ millimetres at the longest part, light brown.—T. W. F.

WASHINGTON MEETING OF THE ENTOMOLOGICAL
SOCIETY OF AMERICA.

The sixth annual meeting of the Entomological Society of America was held in Room 376 of the new U. S. National Museum Building on Tuesday and Wednesday, December 26 and 27.

The following papers were read:—

- Herbert Osborn.—Faunistic studies in entomology.
- E. P. Felt.—Numerals as aids in classification.
- E. S. Tucker.—Studies of insects bred and collected from the American mistletoe. Presented by Andrew Rutherford.
- H. C. Severin.—The influence of temperature on the moulting of the walking-stick, *Diapheromera femorata*. (Title only.)
- R. Matheson and C. R. Crosby.—Notes on aquatic Hymenoptera. Presented by C. R. Crosby.
- Ann H. Morgan.—Photographs illustrating the life histories of May-flies.
- H. Y. Tsou.—The Chinese wax-scale, *Erecerus pe-la*.
- A. D. MacGillivray.—The lacinia in the maxilla of the Hymenoptera.
- Lucy Wright Smith.—Glycogen in insects, especially in the nervous system and the eyes.
- J. A. Nelson.—Note on an abnormal queen bee.
- J. Chester Bradley.—The designation of the venation of the hymenopterous wing.
- Ann H. Morgan.—Homologies in the wing-veins of May-flies.
- A. D. MacGillivray.—The pupal wings of *Hepialus thule*.
- J. Chester Bradley.—The wing venation of chalcid flies.
- F. M. Webster.—Our present educational system in relation to the training of economic entomologists.
- C. W. Johnson.—The use of colour in designating types and varieties.
- Leonard Haseman.—Entomological work in Missouri.
- Herbert Osborn.—A problem in the flight of insects.
- E. P. Felt.—The biology of *Miastor* and *Oligarces*.
- P. P. Calvert.—Seasonal collecting in Costa Rica.
- W. L. W. Field.—Hybrid butterflies of the genera *Basilarchia*.

The following papers were read by title only, because of the expiration of the time allowed for the reading of papers :—

O. A. Johannsen.—Cocoon making by *Bucculatrix canadensisella*.

J. G. Needham.—Some adaptive features of myrmeleonid venation.

E. H. Strickland.—The Pezomachini of North America.

Z. P. Metcalf.—Homologies of the wing-veins of Homoptera Auchenorrhynchi.

The following officers were elected for 1912 :—

President.—S. A. Forbes.

First Vice-President.—A. D. Hopkins.

Second Vice-President.—C. P. Gillette.

Secretary-Treasurer.—A. D. MacGillivray.

Additional Members of Executive Committee.—J. H. Comstock, John B. Smith, Henry Skinner, Herbert Osborn, E. D. Ball, P. P. Calvert.

Member of Committee on Nomenclature for three years.—H. T. Fernald.

The Society adjourned, to meet with the American Association for the Advancement of Science, at Cleveland, Ohio, January, 1913.

ALEX. D. MACGILLIVRAY, Secretary-Treasurer.

FINAL REPORT OF THE JAMES FLETCHER MEMORIAL COMMITTEE OF THE OTTAWA FIELD NATURALISTS' CLUB.

The Memorial Fountain, erected on the Central Experimental Farm, was unveiled on July 19th, 1910. Several hundreds of people were present at the ceremony, including some distinguished visitors from a distance. Official representatives of the Royal Society of Canada, the Entomological Society of Ontario and the Ottawa Field Naturalists' Club, were present, and took a prominent part in the proceedings. The Fountain, including the medallion, is the work of Dr. R. Tait McKenzie, of the University of Pennsylvania, Philadelphia, U. S. A.

The Memorial portrait, which is the work of Mr. Franklyn Brownell, R.C.A., was unveiled at an evening meeting of the Ottawa Field Naturalists' Club on January 9th, 1912. It is an exceedingly good likeness of the late Dr. Fletcher, and, as most satisfactory arrangements have been made with

the Municipal Library Board and the Librarian of the Carnegie Library, the portrait will be hung in a prominent place in this latter building.

CASH STATEMENT.

Receipts.

Total amount paid by subscribers.....	\$1838 85
Bank interest.....	22 61
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	\$1861 46

Expenditure.

Cost of Memorial Fountain.....	\$1500 00
Cost of Portrait, including frame.....	225 00
Miscellaneous expenses: printing envelopes, receipt forms, postage, travelling, etc.....	136 46
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	\$1861 46

On behalf of the Committee,

ARTHUR GIBSON, Secretary-Treasurer.

Ottawa, January 29th, 1912.

ADDITIONS TO THE LIBRARY.

The Librarian of the Entomological Society of Ontario has much pleasure in acknowledging the receipt of the following publications, a present from the Trustees of the British Museum, London, England: "Monograph of the Culicidæ of the World," by F. V. Theobald, Vols. 3 and 5; "Synonymic Catalogue of Orthoptera," by W. F. Kirby, Vol. III; "Illustrations of Lepidoptera," Parts 6 to 9, 4 vols., quarto, illustrated with beautiful coloured plates.

These books form a very welcome addition to the library.

M. PAUL NOEL, Directeur du Laboratoire Regional, d'Entomologie Agricole de la Seine-Inferieure, Route de Neufchatel, 41, Rouen, France, desiring to publish a work on the properties which certain female insects possess of being able to attract the males from a great distance, will be very grateful to entomologists who would be willing to give him any well-authenticated facts relating to this attraction. He would send in return some of his entomological publications and the work in question immediately after it is printed.

Mailed February, 9th, 1912.