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NEW ROCKY MOUNTAIN BEES, AND OTHER NOTES.

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

Bombus iridis phacellæ, n. var.—♀. Hair of face black, with a little pale intermixed; yellow hair of thorax in front dense, not at all mixed with black; yellow of scutellum neither divided nor mixed with black; hair on inner side of basal joints of tarsi dark; hair on second and third abdominal segments entirely deep red (much less dense, and not nearly so bright as in *B. ternarius*), but second with a large bare median triangle; hair of fourth segment and sides of fifth yellow.

Hab.—Ward, Colorado; alt. 9,000 ft., at flowers of *Phacelia circinata*, July 18, 1905. (W. P. & T. D. A. Ckl.) This has the structure of *B. iridis*, but the brightly-coloured abdomen gives it such a different aspect that I at first took it for a new species. I am now convinced that *B. iridis* belongs to the series of *B. ternarius*, in which it is easily recognizable by the red of abdomen being confined to segments 2 and 3, hair of face mostly black, yellow of thorax anteriorly not mixed with black, and pubescence on inner side of hind tarsi fuscous. No doubt *bifarius* and *ornatus* are varieties of *ternarius*, but *iridis* appears to be a perfectly valid species.

Osmia hypocrita, n. sp.—♀. Black; of the narrow, parallel-sided type; abdomen shining, scopa black; front, vertex, thorax above, and first two segments of abdomen, with much rather dull white hair; pleura, rest of abdomen, and legs, with black hair, not at all dense. Length about (or hardly) 13 mm., width of abdomen about $3\frac{1}{2}$ mm. In all respects this is so like *Monumetha argentifrons* that, until I examined it with a lens, I did not doubt that it belonged to that species. It is, nevertheless, undoubtedly distinct, and will be easily separated by the following characters: Mandibles smaller, in the closed condition I see only two teeth, and there do not seem to be others; the upper and lower (or inner and outer) mandibular carinæ are, at their ends, at least twice as close together as those of *M. argentifrons*; clypeus with a strong, smooth and shining, longitudinal median ridge; anterior edge of clypeus somewhat turned up, and broadly and shallowly emarginate; hair on clypeus and at its sides white, but some short black hair near its anterior edge; eyes diverging above (in *M. argentifrons* they slightly converge above); hair on lower part of cheeks white; vertex smaller; parapsidal grooves strongly converging anteriorly; punctures of mesothorax denser and smaller; the wings offer nothing distinctive in colour or venation, except that the second recurrent nervure is less distant from the end of the second submarginal

May, 1906

Hymenoptera - Apoidea

[*Bombus*
Osmia
Nomada
Augochloa
Sphaerodes
Colletes
Colletes
Psithyrus
Ceratium
Proteranthes
Hypocrita
Andrena
Apis
Crocina
Megachile
Halictus
Eulaema
Episus]

cell; the abdomen and legs are about the same, except that the light hair of the abdomen has not any distinct tendency to form patches, and is reduced almost to nothing on the third segment. Perhaps this should be referred to *Monumetha*, if that is a valid genus; but I am not quite sure whether it is really a close ally of *M. argentifrons* or an example of "convergent evolution." *O. frigida*, Sm., seems to be allied.

Hab.—Boulder, Colo., June 27, 1905. (W. P. Cockerell.)

Osmia Novomexicana, Ckll., was taken at Boulder, Colo., June 17, 1905. (W. P. Cockerell.) It is new to Colorado.

Nomada ornithica, n. sp.—♂. Length, 8 mm., or a little more; black and lemon-yellow, with some red on legs; belongs to the subgenus *Xanthidium*. Head and thorax densely and coarsely rugoso-punctate; eyes sage-green; head broad; mandibles (except apically), labrum, clypeus, supraclypeal mark (which is large, and broader than long) and lateral face-marks all yellow, except that there is a very small black spot on each side of clypeus, at the suture; labrum with a very small apical tubercle; face little hairy, but the supraclypeal area and upper part of clypeus are covered with appressed white hair; lateral face-marks triangular, following clypeus to the top, but ending bluntly and a little away from the orbital margin, a short distance below level of antennæ; lower orbital margin narrowly yellow, the stripe going a short distance up the posterior margin; scape swollen, lemon-yellow, black behind; flagellum thick, red beneath and laterally, but black above, the black more extensive on the apical joints; no sign of denticulation; third antennal joint about half as long as fourth; mesothorax coarsely rugoso-punctate, entirely black; upper border of prothorax, tubercles, tegulæ, large mark on pleura (having the shape of a bird's head and neck, the tip of the bill almost touching the tubercle), scutellum, except margins, and a short band on postscutellum, all yellow; scutellum swollen and bigibbous; metathorax black, with a small yellow spot on each side near the lower end; anterior coxæ without spines; legs yellow, suffused with ferruginous basally, with black on the coxæ, trochanters, and posterior femora and tibiæ behind; wings dusky at apex, stigma ferruginous, nervures more fuscous; basal nervure meeting transverse-medial; second submarginal cell twice as broad as third above; abdomen very minutely punctured, and with six broad yellow bands, the intervals between the first four black, but the hind margins of the fourth and fifth segments reddish; apical segment black basally; apical plate notched; ventral segments nearly all

yellow, with the hind margins broadly light reddish, except the basal segment, which is black, with a large yellow mark not unlike a buffalo-skull in shape.

Hab.—Boulder, Colo., June 11, 1905. (W. P. Cockerell.) In many respects this agrees with the description of *N. flavipes*, Provancher, but I have supposed that to be really a *Micronomada*. Should *flavipes* prove to be a *Xanthidium*, it will be separated from *N. ornithica* by its larger size, yellow posterior orbits, yellow of scutellum reduced to two spots, darker wings, etc., but it is known only in the female, and the male might show more resemblance. In my table of Rocky Mountain *Nomada*, *N. ornithica* runs to *N. civilis*, which it closely resembles in general appearance, but it is easily known from *civilis*, by the broad short lateral face-marks, the much more parallel orbits, the longer fourth antennal joint, etc. In my *Xanthidium* table (Proc. Phila. Acad., 1903, p. 580) it runs to *N. pascoensis*, but differs in the lateral face-marks, much less red on legs, etc.

Augochlora fervida, Smith.—Boulder, Colo.; 2 ♀'s, June 4 and 10, 1905. (W. P. Cockerell.) Mr. Titus does not credit this species to Colorado in his article in CAN. ENT., May, 1901. Our specimens have the hind spur with four spines, except that one has only three on one side. They differ from *A. humeralis* in having the first four ventral segments of abdomen green, but it is doubtful whether *humeralis* is really a distinct species. In Mr. Vachal's recent paper (Misc. Entomologica, 1903-4) the species of *Augochlora* are referred to *Halictus*, and *humeralis*, being preoccupied in that genus, is changed to *Pattoni*. However, the description of *Pattoni* given by Vachal does not accord with *humeralis*; but, except for certain characters (colour of tibiae and tarsi, 4-spined spur) of the legs, suggests *A. cerulea*, Ashm., and a specimen is cited from Fort Lupton, Colo., which must be one of those already recorded by Titus as *cerulea*. On the other hand, I feel reasonably sure that the Texas material of *chorisis*, Vachal, must have been *fervida*.

Sphecodes eustictus, n. sp.—♀. Length hardly 6 mm. A *Sphecodium* (this hardly seems a distinct genus), allied to and closely resembling *S. Cressonii*, Rob., or *S. mandibularis*, Cress. (these are probably not distinct species), but very easily distinguished from these by the conspicuously punctured second abdominal segment.

Labrum not emarginate; mandibles ferruginous; antennal joints 3 and 4 both very short, and of about the same length; punctures of vertex strong and dense; of clypeus very large but sparse; mesothorax shining, with large, distinctly-separated punctures; tegulae pale testaceous; area

of metathorax semicircular, well defined, well plicate basally, otherwise with irregular raised lines, forming a few polygonal areas: basal nervure falling short of transverso-medial; fifth and sixth abdominal segments darkened; first segment with very sparse punctures, irregularly scattered, some large, some microscopical, the effect reminding one of the stars in the sky; basal half of second segment with numerous very distinct punctures, and minute (microscopical) ones scattered between; third segment hairy, with numerous minute piliferous punctures.

Hab.—Prospect Lake, Colorado Springs, Colo., May 22, 1904.
(T. D. A. & W. P. Ckll)

Colletes salicicola, Ckll., subsp. *geranii*, nov.—♂. Compared with female *salicicola* (the only sex known) from Las Cruces, N. M., *geranii* shows the greatest similarity, only the following differences being such as might not well be merely sexual: malar space longer, being about or nearly as long as broad; first recurrent nervure joining the very broad second submarginal cell at or a little beyond its middle (conspicuously beyond in *salicicola*); clypeus with very close small punctures in the middle above; sides of apical triangle of metathorax (below the transverse ridge) wholly without the definite fine raised lines of *salicicola*; first abdominal segment more strongly punctured. The abundant white hair is as in *salicicola*. Flagellum long, very dark reddish, nearly black; stigma ferruginous; no black hair anywhere; legs black, only the claws and ends of claw-joints ferruginous; labrum with a median pit. Length 8 mm.

In my table in *Psyche*, 1905, it runs to *C. gaudialis*, but differs by the colour of the stigma and thoracic hair. It does not agree with anything in Robertson's table; it runs first to 4, and then on to 5, though joint 4 is not quite as long as $2 + 3$, then on to 10, where it could only be compared with *C. productus*, but the punctures of the scutellum are similar to those of the mesothorax, and the tegulae are clear testaceous (black in *productus*).

Hab.—Boulder, Colo. (W. P. Cockerell.) Five males, June 10 to 27; one at flowers of wild *Geranium*.

Colletes Tucsonensis, n. sp.—♂. Tucson, Ariz., Nov. 7. (Cockerell.) Length nearly 9 mm.; exceedingly like *C. salicicola geranii*, but differing thus: malar space shorter, distinctly broader than long; labrum with three broad grooves or sulci; punctures of mesothorax rather larger; abdomen broader, the punctures of the first segment sparser. The white

hair is quite the same. It is also very like *C. gypsicolens*, Ckll., but differs from that by the much broader abdomen, with the second and third segments very much more strongly punctured, and the darker, redder stigma. The lateral faces of truncation of metathorax are shining, with piliferous punctures; the triangle (below the cross-ridge) is very shiny, scarcely at all sculptured, except for a median longitudinal keel failing below. The tegulae are rufo-testaceous, darkened basally. Second submarginal cell very broad; b. n. falling a rather long distance short of t. m. (almost reaching t. m. in *gypsicolens*). In Morice's European table (Tr. Ent. Soc., Lond., 1904), *C. Tucsonensis* runs to *C. nanus*, but it is larger, and the abdominal bands are by no means as broad as the spaces between them. The malar space is, however, rather short for this group, and if we look for the species among those with a short malar space (for which, however, it is a little too long) it runs to 15, and has long erect hairs on disc of second segment, but only short ones on the following. It could then run to 19 (the intermediate joints of posterior tarsi being longer than broad), but the sixth ventral plate is quite simple, there being at most a faint basal elevation of small size to indicate the rudiment of a carina. (This plate is also simple in *gypsicolens*, but in *geranii* it has a distinct though delicate carina).

Greeleyella Beardsleyi, Ckll.—Boulder, Colo., June 5, 1905. (W. P. Cockerell.) One ♂. This genus and species was previously known only from the female, obtained at Greeley, Colo., where, as I learn from Professor Beardsley, it visits the flowers of *Malvastrum coccineum*. The male from Boulder has darker nervures, a less obliquely truncate marginal cell, and the first recurrent nervure enters the first submarginal cell not far from the end, instead of meeting the transverso-cubital. These differences may possibly indicate a second species, but I do not think so. The sexual characters are as follows: Head broad and subquadrate; clypeus creamy white, with a black process directed downwards on each side of the labrum; face otherwise dark; labrum ferruginous, with a prominent transverse ridge or keel; mandibles nearly all ferruginous; tibiae and tarsi, and about apical third of femora, light ferruginous.

Since writing the above, I have found in my wife's collection a female taken at Boulder, June 17, 1905, at flowers of *Malvastrum*. It agrees in venation with the female type. There is also a male taken June 17, in which the first recurrent nervure joins the transverso-cubital, but otherwise identical with the male of June 5.

Ceratina nanula, Ckll.—Boulder, Colo., June 27, 1905. One ♀ at flowers of *Calochortus Gunnisoni*, and one ♂ at flowers of *Osmodium* (W. P. Cockerell), known from *C. Neomexicana* by the very small size and clear wings. This and the next are new to Colorado.

Ceratina Neomexicana, Ckll.—Common at Boulder, Colo. The male, not before described, differs in the usual manner from the female; the branches of the clypeal T are about equally long, but the upper one is much broadest; the supraclypeal area has a few large punctures; the projecting point on the sixth abdominal segment is covered with light hair having a fulvous tint; apical projection small and low; process on hind femora large, forming more than a right angle. This is, perhaps, more like *C. Tejonensis* than any other male *Ceratina*, but the end of the abdomen is quite different. The Boulder females include specimens with the following data: June 26, at flowers of *Platycodon grandiflorum* in cult. (Ckll.); Aug. 3, in flower of *Argemone intermedia* (Ckll.); June 12, at flowers of *Onosmodium* (W. P. Ckll.); June 27, at flowers of *Calochortus Gunnisoni* (W. P. Ckll.); April (Sellars and Williams).

Sphecodes Pecosensis, Ckll.—Boulder, Colo., 1905. (W. P. Ckll.) The specimen has the mandibles only bulging within, with nothing that could be called a tooth, but it is in all other respects exactly like one from Cheyenne Canon, which has a well-formed tooth, as in the type. It is evident that the presence or absence of a tooth on the mandibles should not be held to distinguish a species of *Sphecodes* (at any rate, when exhibited by a single specimen) in the absence of other characters. *S. Pecosensis* has much superficial resemblance to a number of species, but is easily known by the first two abdominal segments being sparsely punctured, the punctures conspicuously of two sizes, the strongly-depressed suture between these segments, and the dark hair at the apex of the abdomen.

Proteraner leptanthi, Ckll., was also taken by my wife at Boulder (male, June 10); so also *Sphecodes Sophieæ*, Ckll. (♀, June 12.)

Prosopis Fedtschenkoi, n. n.—*Prosopis frontalis* (F. Morawitz, in Fedtschenko, Turkestan Mellifera, II., 1876, p. 275). (Not of Fabricius, 1804.)

The Fabrician insect is a *Camptopocum*, but it was described as a *Prosopis*, and according to the rules in vogue the name may not be repeated in the genus.

Prosopis Pereziana, n. n.—*Prosopis Morawitzi*, Perez. Esp. Nouvelles Mellifères, 1903, p. 68. (Not of Dalla Torre, 1896.)

Andrena metallescens, n. n.—*Andrena metallica*, Radosz. Horæ Soc. Ent. Ross., 1876, p. 83. (Not of Fabricius, 1793.)

Andrena succincta, Imhof, 1832.—This name is a homonym, because of *A. succincta*, Fabr., 1781, Petagna, 1786 (= *Dasyptoda*), but the species is quite uncertain, and being now nameless, may be consigned to oblivion.

Apis dorsata Binghami, n. n.—*Apis zonata*, Smith. Jn. Linn. Soc. III, 1859, p. 8. (Not of Gravenhorst, 1807.)

Apis mellifera Lamarckii, n. n.—*Apis fasciata*, Latreille. An. Mus. Hist. Nat., 1804, p. 171. (Not of Linné, 1767.)

Crocisa Frieseana, n. n.—*Crocisa atra*, Friese. Z. f. Hym. u. Dipt., 1905, p. 7. (Sunda Archipelago.) (Not of Jurine, 1807.)

The following are also homonyms, and must be given new names :

Megachile pruinosa, Friese, 1903. Texas. (Not of Perez, 1897.) Friese (in litt.) holds that *pruinosa*, Perez, is *argentata*.

Sphecodes gracilior, Perez, 1903. Algeria. (Not of Morawitz, 1894.)

Nomada superba, Perez, 1903. France. (Not of Cresson.) Prof. Perez writes that his *superba* is a remarkable variety of *N. chrysopyga*, Morawitz; it may stand as *N. chrysopyga* *Pereziana*.

Colletes brevicornis, Perez, 1903. (Not of Robertson, 1897.)

Halictus testaceus, Nurse, 1902. India. (Not of Robertson, 1897.) Nurse has proposed the name *H. orpheus* for his species.

Halictus nigricornis, (Fabr.) Say, 1837, does not invalidate *H. nigricornis*, Morawitz, 1886 (from Tibet), because the Fabrician insect was originally described under *Andrena*, and is an *Agapostemon*. It is a generally accepted (I believe) and very excellent restriction of the rule regarding homonyms, that secondary references (*i. e.*, subsequent to the original description) do not count, unless the species referred is still considered to belong to the genus to which it was transferred.*

Eulema, Lep.—Lepeletier, Hist. Nat. Ins., Vol. 2, 1841, spells this name *Eulæma*, giving *Eulema* as the vernacular (French) rendering. Curiously, all authors have used the latter spelling instead of the former. Scudder (Nomenclator Zoologicus) has the correct spelling.

Epeolus interruptus, Rob.—Boulder, Colo. At flowers of *Townsendia grandiflora*, July 5, 1905. 3 ♀'s. (W. P. Cockerell.) Previously known only from Illinois.

*Incidentally, it is to be noted that some of the names of our Noctuid moths are homonyms. Thus *Lycophotia congrua* is based on *Agrotis congrua*, Smith, 1890, not of Walker, 1865. *Triphæna confusa* is based on *Agrotis confusa*, Smith, 1887, not of Alpheraky, 1882.