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1-17-06
**The Bees of the Genus *Nomada*
Found in Colorado,**

**With a Table to Separate All the Species
of the Rocky Mountains.**

BY T. D. A. COCKERELL. 1903

When I undertook to work up the species of *Nomada* contained in the collection of the Colorado Agricultural College, I supposed that I should find a few new ones, but that the great majority would be well-known forms long ago discovered by Morrison, Ridings, and others. I find that the collection contains 29 species and varieties, and of these no less than 15 are new. Two others represent undescribed sexes of species previously known. This result serves to indicate the richness of the Agricultural College collection in rare and new forms, and the great value of the material gathered together by Professor Gillette and his associates. I have included in the table of species all those known to occur in Montana, Wyoming, Colorado and New Mexico. Some synonyms and doubtful records have been omitted. Our knowledge of the more northern species, from Wyoming and Montana; is exceedingly incomplete, but it is perhaps not without significance that the few species known from these states all range eastward. The species of Colorado, on the other hand, appear to represent a largely endemic fauna, though some eastern elements appear, particularly in the north. It is possible to separate the species into three groups, those which belong to the Rocky Mountain fauna proper,

Hymenoptera - Apoidea - Nomada

those which are modified representatives of eastern species, and have probably reached Colorado in comparatively recent times, and those which are identical with species found east of the plains. Examples are as follows:

(1.) Rocky Mountain Fauna.—*N. rubrella*, *schwarzi*, *martinella*, *scita*, *grandis*, *civilis*, etc.

(2.) Modified eastern types.—*N. lepida*, *dacotana*, *vegana*, *zebrata*, *luteopicta*.

(3.) Typical eastern species.—*N. bella*, *albofasciata*, *cuneata superba*, *vincta*.

A few appear to be modifications of northwestern types; such are *taraxacella*, *pecosensis*, and possibly a few others. How far the species extend westward through Utah, etc., cannot be stated, owing to our almost complete ignorance of the *Nomadæ* of that region; but the California *Nomada*-fauna is very distinct from that of Colorado, and the comparatively few species seen from Nevada indicate the extension of the Californian fauna, at least in part, into that state. The same indications exist for Idaho.

The *Nomadæ* of the mountains of northern New Mexico naturally resemble those of Colorado to a considerable extent, but our present lists show a rather surprising amount of difference, perhaps mainly the result of inadequate collecting. The species of southern New Mexico are different, and belong to a southwestern fauna which no doubt extends into Arizona and northern Mexico, though no knowledge of the *Nomadæ* of those regions exists, excepting a single record from Juarez in Chihuahua.

It is hoped that the present paper will facilitate the study of *Nomada* in Colorado. The genus offers a very excellent field for research, and I venture to hope that some advanced student of the Agricultural College will interest himself in it. Undoubtedly more new species await discovery, while the habits of none of the species have been investigated. Very many species are known only in one sex, and there are probably some cases in which the opposite sexes of the same species have been described as distinct.

As is well known, *Nomada* is parasitic in the nests of other bees, principally *Andrena* and *Halictus*. This parasitism should be carefully studied, and it is necessary to breed the bees from the nests in order to fully establish it. It is difficult for me to believe that the same species of *Nomada* can be parasitic in nests of both *Andrena* and *Eucera*, as has been reported of *N. alternata* and *N. agrestis*; or in nests of both *Halictus* and *Colletes* as is recorded of *N. furva*.

TABLE FOR THE DETERMINATION OF THE SPECIES.

Vertex and mesothorax smooth and shining; male entirely black, females with a red abdomen (Montana).....	<i>grindellæ</i> Ckll.
Not so, never entirely black.....	1.

1. Normally with only two submarginal cells; abdomen red with yellow bands, first segment red without a band (Montana).....*obliterata* Cress.
Normally with three submarginal cells.....2
2. Very large and robust, over 13 mm. long, red with abundant yellow markings3.
Smaller, usually much smaller4.
3. Basal nervure considerably basad of transverse medial (Colo.).....*grandis* Cress.
Basal nervure meeting transverse medial (Colo.).....*magnifica* Ckll.
4. Mandibles bidentate5.
Mandibles simple.....14.
5. Males6.
Females.....12.
6. Tegulae more or less yellow; scutellum usually with yellow spots; abdomen with yellow bands (Colo.).....*lepida* Cress.
Tegulae red; scutellum black or red.....7.
7. Thorax red marked with black.....8.
Thorax black, with or without red spot on the scutellum.....10.
8. Length about 7 mm.; light markings creamy white; metathorax red with a central black mark. (Colo.).....*rubrella* Ckll.
Size larger; abdominal markings strongly yellow; metathorax entirely black.....9.
9. Third antennal joint long; second submarginal cell broad above. (Colo.)*schwarzi* Ckll.
Third antennal joint shorter; second submarginal cell narrow above (N. M.).....*schwarzi contractula* Ckll.
10. Size larger, length 9 to 10 mm., abdomen with yellow bands. (Colo.).....*bella* Cress.
Size smaller .. 11.
Abdomen with white bands. (Colo.).....*albofasciata* Smith.
Abdomen with yellow spots or bands. (Colo.).....*cuneata* (Rob.)
12. Larger, 10 mm. long or over. (Colo.)*bella* Cress.
Smaller, 8 or 9 mm. long.....13.
13. Red of abdomen dark. (Colo.)*cuneata* (Rob.)
Red of abdomen light. (Colo.)*lepida* Cress.
14. Anterior coxae strongly spined; abdomen strongly punctured.....15.
Anterior coxae not or hardly spined; abdomen usually very minutely or not distinctly punctured.....35.
15. Males16.
Females26.
16. Apex of abdomen entire; supraclypeal mark surrounded by black. (N. M.).....*lippiae* Ckll.
Apex of abdomen notched, though sometimes feebly.....17.
17. Flagellum with a light median area, on each side of which is black.....18.
Flagellum ordinary, not so colored.....21.
18. Tegulae pale yellow or whitish; supraclypeal mark present.....19.
Tegulae deep ferruginous; ground-color of abdomen nearly all red. (Colo., Mont.).....*americana dactotana* Ckll.
19. First abdominal segment largely red, without light markings. (N. M.).....*sophiarum* Ckll.
First abdominal segment black or almost, with a narrowly interrupted cream-colored band.....20
20. Abdomen comparatively narrow; legs clear light red. (Colo.).....*scita* Cress.
Abdomen broad; legs darker. (Colo.).....*martinella* Ckll.
21. Metathorax with yellow marks. (Colo., N. M.).....*vegana* (Ckll.)
Metathorax without yellow marks.....22
22. Mesothorax reddish, size rather large; wings dark. (Colo.).....*lamarensis* Ckll.
Mesothorax entirely black, size smaller23

23. Labrum entirely light red; light markings primrose-yellow;
wings clear, strongly clouded at apex. (Colo.).....*uhleri* Ckll.
Labrum yellowish-white. (Colo.).....*snowi* Cress.
Labrum blackish, or with a large black spot.....24
24. Light markings white; flies in spring. (N. M.).....*vierecki* Ckll.
Light markings yellow; fly in middle and late summer25
25. Ventral surface of abdomen with two light bands. (N. M.) *crucis* Ckll.
Ventral surface of abdomen dark with only minute light
marks (N. M.).....*neomexicana* Ckll.
26. Abdomen red, without light bands.....27.
Abdomen with light bands.....28.
27. Flagellum clear red. (N. M., Colo.).....*martinella* Ckll.
Flagellum strongly dusky. (Colo., Mont.)*americana* *dacotana* Ckll.
28. Mesothorax reddish (here expect the unknown ♀ of *lamarensis* Ckll.)
Mesothorax black, with little if any red.....29.
29. Abdomen red with white bands30.
Not so, ground-color of abdomen mainly or wholly black.....31.
30. Mesothorax densely punctured. (Colo.).....*ridingsli* Cress.
Mesothorax with well-separated punctures on a shining
ground. (N. M.).....*vierecki* Ckll. var.
31. Lateral face-markings white or yellowish white.32.
Lateral face-markings yellow.....33.
32. Mesothorax densely punctured (Colo.).....*snowi* Cress.
Mesothorax sparsely punctured on a shining ground (N.
M.)*vierecki* Ckll.
33. Mesothorax with well separated punctures on a shining
ground; ground color of first abdominal segment red
(Colo.).....*vegana nitescens* Ckll.
Mesothorax densely punctured.....34.
34. Metathorax with yellow spots (Colo., N. M.).....*vegana* Ckll.
Metathorax without yellow spots (N. M.)*neomexicana* Ckll.
35. Abdomen with numerous entire (or some slightly interrupted)
light bands.....36.
Abdomen with light bands, more or less widely interrupted,
at least on some of the segments.....59.
Abdomen red, with small yellow spots (sometimes bands on
apical segments) or no light markings.....66.
36. Abdominal bands white or yellowish-white; no light mark-
ings on head or thorax; venter of abdomen ferruginous,
immaculate.....37.
Abdominal bands yellow.....38.
37. Scutellum strongly bilobate; wings paler (Colo.).....*parata* Cress.
Scutellum not strongly bilobate; wings darker (Colo.).....*munda* Cress.
38. Legs yellow and black, without very much red.....39.
Legs wholly or mainly red, or red and yellow.....40.
39. Smaller; third antennal joint shorter than fourth on the under
(light) side (Colo.).....*civills* Cress.
Larger; third antennal joint longer than fourth on the under
side (N. M.).....*pecosensis* (Ckll.)
40. First abdominal segment without yellow; ♂s.....41.
First abdominal segment with yellow.....43.
41. First abdominal segment black; scutellum black (N. M.).....*ruidosensis* Ckll.
First abdominal segment red and black42.
42. Size larger, scutellum red (Colo.).....*coloradensis* Ckll.
Size small, scutellum black with small light spots (Colo.)
.....*coloradella* Ckll.
43. First abdominal segment black and red, with a yellow spot
on each extreme lateral margin; flagellum stout, third ant-
ennal joint shorter than fourth; basal nervure basad of
transverse-medial.44.
First abdominal segment with a yellow band, entire or inter-
rupted45.

44. Flies in June; a good deal of yellow on head and thorax (Colo.).....*crawfordi* Ckll.
Flies in May; no yellow on head and thorax (Colo.)...*collinsiana* Ckll.
45. Metathorax ferruginous and black, without any yellow; ♂s.....46.
Metathorax entirely black.....47.
Metathorax black with rather small light spots; lateral face-marks broad, but not or hardly going above level of antennæ; apical plate of abdomen more or less notched; ♂s51.
Metathorax with two large yellow (or yellow and red) spots.....52.
46. Metathorax black without much ferruginous; scutellum and postscutellum yellow; apical plate of abdomen entire; flies in August (N. M.).....*xanthophila* Ckll.
Metathorax with more red; scutellum red, postscutellum yellowish; size smaller; apical plate of abdomen deeply notched (Colo.).....*libata* Cress.
47. Size larger; tegulæ yellow; apical plate of ♂ abdomen entire (Colo., Wyo.).....*superba* Cress.
Size much smaller48.
48. Tegulæ yellow (Colo.).....*luteopicta* Ckll.
Tegulæ ferruginous.49.
49. Head and thorax with much red; larger; flies in spring; ♀ (N. M.).....*placitensis* Ckll.
Head and thorax without red; smaller; apical plate of abdomen notched; ♂s.....50.
50. Antennæ very long, denticulate beneath; fourth joint very long, at least twice as long as third on upper side (N. M., Colo.).....*fragilis* Cress.
Antennæ not so long, not denticulate beneath; fourth joint not nearly twice length of third on upper side (Colo.)*pallidella* Ckll.
51. Supraclypeal mark present; metathorax with four reddish or yellowish spots, two being on the enclosure (Mont.)...*elrodi* Ckll.
Supraclypeal mark absent; metathorax with two small oval yellow spots (Colo.).....*gillettei* Ckll.
52. Basal nervure meeting transverse-medial or falling short of it; species (at least *vincta* and *zebrata*) flying in late summer and early fall53.
Basal nervure beginning decidedly (often greatly) basad of transverse-medial.....54.
53. Apical plate of ♂ abdomen entire; mesothorax of ♂ wholly black, or with very narrow reddish lateral margins, of ♀ black or red and black (Colo.).....*vincta* Say.
Apical plate of ♂ abdomen slightly notched; mesothorax of ♂ with yellow lateral margins, of ♀ red (Colo., N. M.) *zebrata* Cress.
♂ unknown; mesothorax of ♀ black with yellow lateral margins; thorax narrower than in *zebrata*; yellow of metathorax intruding on enclosure (which is not the case in *vincta* or *zebrata*); third antennal joint considerably shorter than fourth (it is considerably longer than fourth in *zebrata* and *vincta*) (Colo.).....*perivincta* Ckll.
54. Mesothorax black, with the anterior lateral corners red; apical plate of abdomen truncate, not appreciably emarginate; sides of metathoracic enclosure yellowish; ♂ (Colo.).....*agynia* Ckll.
Mesothorax red, with or without a black band; ♀s55.
55. Flagellum strongly blackened at end, mesothorax with a broad median black band; scutellum yellow without a median dark stripe or shade; basal nervure a short distance basad of transverse-medial; third antennal joint a little shorter than fourth (Colo.).....*perivincta* var. *semirufula* Ckll.
Flagellum red, not blackened at end56.
56. Ventral surface of abdomen yellow, with narrow red bands; scutellum at least mostly yellow.....57.

- Ventral surface of abdomen red banded with yellow; third antennal joint shorter than fourth.....58.
57. Third antennal joint long; fourth considerably longer than fifth (Colo.).....*morrisoni* var. *flagellaris* Ckll.
Third antennal joint shorter; fourth scarcely longer than fifth (Colo.).....*morrisoni* Cress.
58. Scutellum prominent, entirely red; tegulae strongly punctured; third antennal joint much shorter than fourth (Colo.).....*rhodoxantha* Ckll.
Scutellum not prominent, with a yellow band at base; tegulae smooth and shining; third antennal joint a little shorter than fourth (Colo.).....*dilucida* Cress.
59. Markings white or cream-color.....60.
Markings yellow.....62.
60. Ferruginous species; third antennal joint much longer than fourth (N. M.).....*gutierreziae* Ckll.
Black or red and black species.....61.
61. Scutellum black with two cream-colored spots; head and thorax without red; third antennal joint slightly longer than fourth; ♂ (N. M.).....*aquilarum* Ckll.
Scutellum ferruginous; thorax with much red in both sexes, third antennal joint much shorter than fourth (Colo.) *accepta* Cress.
62. ♂s; head and thorax black.....63.
♀s; head and thorax red, usually marked with black.....64.
63. Smaller, length not over 8 mm.; scutellum black; upper half of clypeus black (N. M.).....*boulahensis* Ckll.
Larger, length 10 mm.; scutellum red; clypeus yellow (Colo.).....*vicinalls* Cress.
64. Tubercles and postscutellum yellow; venter of abdomen largely yellow (Colo.).....*alpha* Ckll.
Tubercles and postscutellum red; venter of abdomen red without yellow.....65.
65. Front marked with black; a black stripe on mesothorax; apex of flagellum fuscous; second abdominal segment with yellow lateral spots, third and fourth with bands (Colo.).....*libata* Cress.
Front wholly red; no black stripe on mesothorax; flagellum wholly red; second and third abdominal segments with large wedge-shaped yellow marks, fourth with a band interrupted on each side (Colo.).....*coloradensis* Ckll.
66. Head and thorax black, abdomen black and rufous.....67.
Head red marked with black; thorax black, a large mark on each side of mesothorax, the scutellums and most of pleura, red; clypeus yellow; abdomen without yellow; ♂ (Colo.).....*adducta* Cress.
Head and thorax red; clypeus red.....68.
67. Clypeus reddish; legs rufous; basal nervure a short distance basad of transverse-medial; third antennal joint a little longer than fourth (N. M.).....*pennigera* Ckll.
Clypeus black; legs black (N. M.).....*sidæfloris* (Ckll.)
68. Larger, about 7 or 8 mm. long; second abdominal segment with yellow spots.....69.
Smaller, about 6 mm. long.....71.
69. Lower anterior orbits very narrowly yellow; third antennal joint very much shorter than fourth (N. M.).....*taraxacella* (Ckll.)
Lower anterior orbits not yellow.....70.
70. Fourth and fifth abdominal segments with yellow bands, not nearly reaching lateral margins; third antennal joint nearly as long as fourth (Colo.).....*luteopicta* Ckll.
Fourth and fifth abdominal segments without yellow bands; third antennal joint much shorter than fourth (Colo.).....*sayi* Rob.
71. Abdomen red without yellow spots; scape stouter and lighter; metathorax without a black band (Colo.).....*rhodosomella* (Ckll.)

Abdomen with spots; scape darker and more slender; meta-thorax with a black band (Colo.) **coloradella** Ckll.

In addition to the species recorded in the table, *Nomada* (*Micronomada*) *putnami*, Cress., *N. (Holonomada) affabilis*, Cress., *N. (Xanthidium) citrina*, Cress., and *N. (Nomada* s. str.) *pygmæa*, Cress., have been recorded from Colorado, but the records appear to require confirmation. The first three are indicated in comparison with Rocky Mountain species in tables in Proc. Acad. Nat. Sci. Phila., 1903, pp. 581, 582 and 609. For *N. affabilis* also see Robertson, Canadian Entomologist, 1903, p. 177. *N. pygmæa* (♂) is about six mm. long, mandibles simple; clypeus, a spot above it, labrum, mandibles and face narrowly on each side of clypeus, yellow; orbits ferruginous; abdomen granular.

DESCRIPTIONS AND NOTES.

Nomada (*Gnathias*) *lepida*, Cresson.

Evidently very common at Fort Collins, Colorado, numerous specimens of both sexes sent by Prof. Gillette. The dates are from May 8 to 17.

The insect which I described (Proc. Acad. Nat. Sci. Phila., 1903 p. 600) as the probable ♀ of *N. schwarzi*, is really the ♀ of *lepida*.

Nomada (*Gnathias*) *cuneata*, (Robertson).

A ♂ (sent by Prof. Gillette) was collected at Fort Collins, foothills, May 10, 1900, by E. S. G. Titus. Others seem intermediate between *lepida* and *cuneata*, and I rather expect that it will become necessary to regard the latter as a subspecies of *lepida*. At the same time, numerous eastern specimens of *cuneata* show no intergradation with *lepida*. It is perhaps a case like that of the bird-genus *Colaptes*.

Nomada (*Gnathias*) *albofasciata*, Smith.

Two ♂s (sent by Prof. Gillette); one Fort Collins, foothills, April 24, 1900, by Titus; the others "Colo. 1581" taken at Fort Collins, foothills, May 6, 1904, by C. F. Baker.

Nomada (*Gnathias*) *bella*, Cresson.

A Colorado ♀ without locality label (sent by Prof. Gillette).

Nomada (*Gnathias*) *rubrella*, new species.

♂; length hardly 7 mm.; closely allied to *N. schwarzi*, but differing as follows: Smaller; light markings creamy-white instead of yellow; sides of front narrowly, sides of vertex broadly (and enclosing a yellow spot), a band behind ocelli, and posterior orbital margins ferruginous; mesothorax dark ferruginous with a median black stripe; most of pleura ferruginous; metathorax (all black in *schwarzi*) ferruginous with an elongate black mark; middle femora with a little more than the basal third black behind, the black very sharply defined from the red; tegulae smaller and yellower; first abdominal segment (black right across at base in *schwarzi*) with very little black, only forming lateral hook-shaped marks; apical portion of abdomen not blackish; apical plate much less strongly notched. In both there is a yellowish mark at the apex of the abdomen beneath.

Habitat. Fort Collins, Colorado, May 18, 1901, near foothills, taken by Mrs. Laura Titus from plum blossoms.

Nomada (*Nomadula*) *americana* variety *dacotana*, Cockerell.

♂, ♀ (sent by Prof. Gillette); the ♀s are not distinguishable from true *americana*. Fort Collins, Colorado, May 28 and June

17. Also Colorado 2562 (Fort Collins, June 11, 1893, C. P. Gillette, collector), 1170 (Fort Collins, June 13, 1893, C. P. Gillette, collector) and 623 (Fort Collins, July 5, 1903, C. P. Gillette, collector).

***Nomada (Nomadula) martinella*, Cockerell.**

Three ♀s (sent by Prof. Gillette) are variable, and do not support the idea that the Colorado form is distinct from that of New Mexico. Two are from Fort Collins, May 28 and June 19; the other is marked Colorado 2521 (Fort Collins, May 28, 1897, E. S. G. Titus, collector).

The ♂ of *N. martinella* has not been described, but I find three specimens in the Colorado collection. They are closely allied to *N. scita*, but are readily separated by the broader abdomen and darker legs; the tegulae are bright lemon yellow with a hyaline spot; the thorax is covered with coarse hair which has a decided brownish tint. The scape is more swollen than in *scita*, and the yellow of the face is darker and stronger. The hind femora are stout with the lower edge decidedly concave. The scutellum is black. These ♂s are marked Fort Collins, May 20 and 21, and Colorado 2521.

***Nomada (Micronomada) vegana*, (Cockerell).**

This was described as a variety of *N. modesta*, but it seems to be a distinct though closely allied species. The ♂s are like true *modesta*, but uniformly small. Prof. Gillette sends five ♂s and two ♀s. They are mostly from Fort Collins, July 4 to 20; one is marked Colorado 1204 (Fort Collins, June 26, 1893, attracted to Helianthus leaves by their secretions.—C. F. Baker, collector).

***Nomada (Micronomada) vegana* variety *nitescens*, new variety.**

♀, just like *vegana*, except that the mesothorax, instead of being very closely punctured, has large irregularly scattered punctures on a shining ground. The ground-color of the first abdominal segment is red, and there is a red supraclipeal mark. Perhaps a distinct species.

Fort Collins, Colorado, August 8, 1899 (E. S. G. Titus, collector).

***Nomada (Micronomada) lamarensis*, new species.**

♂, length about 9½ mm.; red, yellow and black. Markings bright lemon yellow, the pattern as in *N. vegana*, except that the mark on the pleura is narrower, the marks on the metathorax are wholly absent, and the band on the second abdominal segment is extremely broad; the ground-color of the body is dark red, becoming black on the vertex, the anterior part of mesothorax, and the enclosure of metathorax, and almost black on the pleura below the yellow band; the fourth abdominal segment is black anteriorly to the rather narrow yellow band, and the fourth ventral segment is black with two transverse reddish stripes, one on each side. The insect is much more robust than *vegana* (in build similar to *wheeleri*), and the head and thorax are very coarsely punctured; the punctures of the mesothorax are extremely large, and many of them confluent. Those of the pleura also very large. Sides of vertex with the

punctures very irregular, but leaving a good deal of shining surface; antennæ red, third joint longer than fourth, flagellum blackish above; tegulæ yellow with a ferruginous spot and rim; wings dusky, the apex very dark; stigma orange-ferruginous; nervures fuscous; second submarginal cell large and nearly square, receiving the recurrent nervure just beyond the middle; basal nervure meeting transverse-medial; ventral surface of abdomen without yellow markings; legs red, hind coxæ with a yellow spot, hind tibiæ with some yellow; anterior coxæ with red spines. Apical plate deeply notched.

One from Lamar, Colorado, June 17, 1900, (E. D. Ball, collector). This cannot be the ♂ of *N. wheeleri*, as that species has the submarginal cells quite different; in *wheeleri* the third submarginal cell is at least as broad above as the second, in *lamarensis* the second is rather more than twice as broad above as the third. The wings are much darker in *lamarensis* than in *wheeleri*. *N. lamarensis* resembles *N. crassula* in the very coarsely punctured mesothorax, and also in build, but differs in its red color, more strongly (indeed very strongly) bilobed scutellum, presence of a supraclypeal mark, etc.

***Nomada (Micronomada) uhleri*, new species.**

♂; length about $7\frac{1}{2}$ mm.; similar to *N. vegana* but more robust, the abdomen of spherical form, after the manner of *N. erigeronis*; markings light primrose-yellow (deep yellow in *vegana*), similar to those of *vegana*, but the labrum is entirely light red, the scape has only a yellow shade, and the metathorax is wholly without yellow marks; the mesothorax is densely punctured, more densely and coarsely than in *vegana*; ground-color of head and thorax black, but middle of mandibles red, a small red spot beneath the wings, and a red patch above middle and hind coxæ; antennæ red, scape and basal part of flagellum blackened above, the black not ending abruptly; tegulæ primrose-yellow, with hyaline spot and margins; wings clear, with very dark apex; stigma ferruginous, nervures piceous, second marginal cell nearly square, and receiving the recurrent nervure very near the middle; in one wing of the type the first recurrent nervure is divided at the end, forming an areolet under the second submarginal cell; basal nervure meeting transverse-medial, and third antennal joint longer than fourth, as usual in *Micronomada*; spines on anterior coxæ red and very long; legs red, anterior tibiæ with a light yellow stripe in front, hind coxæ with a yellow mark; there is a yellowish spot at the apex of each femur, and at the end of the hind tibia; abdomen dark brown above, clear red on first segment, beneath dark ferruginous, with linear yellowish markings; above, the first segment shows a broad primrose-yellow band, the second an extremely broad band, narrower in the middle, and the others bands which are hidden by the retraction of the segments; apical plate strongly notched.

One from Fort Collins, Colorado, August 18, 1900, (E. S. G. Titus, collector). Named after Dr. Uhler, who was one of the first to collect species of *Nomada* in Colorado.

***Nomada (Holonomada) grandis*, Cresson.**

One marked Colorado 2509, taken in the foothills near Fort Collins, May 26, by C. P. Gillette. This differs from *N. magnifica* in the venation, but otherwise they are practically the same. I do not know whether the differential character, which in the case of *Gnathias* is certainly subgeneric, can here be only varietal.

Nomada (Holonomada) pecosensis, (Cockerell).

A ♂ from Palisades, Colorado, May 7, 1901, from apple bloom, (C. P. Gillette collector). It differs from the ♀ in having the pleura with a comparatively small yellow mark, and no yellow spot in front of anterior ocellus; the abdomen also is more inclined to be punctured. The species is the Rocky Mountain representative of *N. edwardsii*, from which it is easily known by the red color on the legs. Except as to the abdomen, the ♂ *N. pecosensis* agrees with the description of *N. intercepta*, Smith, from Vancouver I., which is evidently a *Holonomada*.

Nomada (Holonomada) vincta, Say.

Perfectly genuine *vincta*, one of each sex, were taken by F. C. Bishopp, at Fort Collins, Colorado, September 4 and 12, 1903, from sunflowers. (*Helianthus* sp.)

Nomada (Holonomada) zebrata, Cresson.

A ♀ collected by E. S. G. Titus at Fort Collins, July 28, 1900. When we consider *N. zebrata*, *vincta*, *morrisoni*, etc., the distinctions between *Holonomada* and *Xanthidium* appear to completely break down. '*Holonomada* might possibly be restricted to *superba*, *edwardsii*, *pecosensis*, and their immediate allies; if this is not done, *Xanthidium* must I think be given up.

Nomada civilis, Cresson.

Three ♂s; Fort Collins, May 12, 1901, from plum blossoms; (E. S. G. Titus, collector) and one Denver, May 2, 1902.

Nomada (Xanthidium) rhodoxantha, new species.

♀; length about 10 mm., head and thorax ferruginous, strongly and closely punctured; scutellum prominent, bilobed; antennæ long, entirely red, third joint much shorter than fourth, flagellum stout; labrum with a minute denticle; extreme lower corners of face yellow, but no yellow on clypeus or mandibles; upper border of prothorax with a yellow stripe; tubercles and tegulæ ferruginous, the latter strongly punctured; pleura with an obscure yellow spot posteriorly; metathorax with a median black band, on each side of which is a large area (including the sides of the enclosure) variegated with red and yellow; legs red, middle femora at base beneath, and hind femora largely blackish; wings clear with a brownish stain along the nervures, tips dusky; stigma bright ferruginous, nervures brown; second submarginal cell broad above, third greatly narrowed above, its outer margin strongly angled; basal nervure a short distance basad of transverse medial; abdomen minutely rugulose, ferruginous, with broad entire yellow bands on all the segments, basal half of first segment black; venter ferruginous, marked with yellow. The mesothorax has a strongly marked median black band.

One specimen, Colorado, without other locality label.

This has the general appearance of *N. morrisoni*, *luteoloides*, etc. From *luteoloides* it is easily known by the ferruginous, densely punctured (minutely cancellate) scutellum. From *morrisoni* it differs by the much narrower mesothorax, with larger and much more distinct punctures; the shape of the third submarginal cell, etc. From *placitensis* it differs by the much longer fourth antennal joint, the absence of the conspicuous brown hair on vertex and dorsum of thorax, etc. A form of

N. rhodozantha differing in some slight details of color, has been taken by Dr. Graenicher at Milwaukee, Wisconsin, on June 3.

***Nomada (Xanthidium) crawfordi*, new species.**

♀; length about 11 mm., another red species with entire and broad bright yellow bands on the abdomen, similar to the last, but the first segment has a round yellow spot on each side, instead of a band. The sides of the face broadly, the anterior edge of the clypeus, the labrum, the upper margin of prothorax, the tubercles, two spots on the tegulae, and four spots on the metathorax, are yellow. The ventral surface of the abdomen is mainly yellow beyond the first segment. The scape is suffused with yellow in front, the flagellum is strongly blackish above towards the end, but the extreme tip is red; the third antennal joint is a little shorter than the fourth; the second submarginal cell is broad above, the third much narrowed above, its outer margin strongly angled; the basal nervure is a short distance basad of the transverso-medial.

It is distinguished from the various similar species thus:

From *N. dilucida* by the mesothorax being entirely red except the narrow anterior border and the median band, which are black; by the scutellum being entirely red; by the metathorax having four yellow spots; by the strongly punctured tegulae; by the hind femora having a long-oval red mark clean-cut out of the blackish at the base behind; by the hind tibiae being entirely red, but the basal joint of the hind tarsi yellow behind; and by the first abdominal segment being red, with a yellow spot on each side between two black spots. From *N. rhodozantha* by the broader form, longer third antennal joint, dusker wings, and quite different pattern of first abdominal segment. From *N. morrisoni* by the longer fourth antennal joint, peculiar color of flagellum, red scutellum, shape of third submarginal cell, etc. From *N. placitensis* by its larger size, yellow on face, much less black on thorax, etc. From *N. zebrata* by the proportions of the antennal joints, red scutellum, etc. From *N. citrina* v. *rufula* by the red pleura and scutellum, the color of the flagellum, the absence of a yellow spot at the apex of the posterior femora, etc. The yellow of the legs is practically confined to the hind tarsi and front knees.

One specimen; Virginia Dale, Colorado, June 20, 1901, F. C. Bishopp, collector. *N. crawfordi* is named after Mr. J. C. Crawford, Jr., in recognition of his work on bees.

***Nomada (Xanthidium) collinsiana*, new species.**

Two ♀s taken by S. A. Johnson, Fort Collins, Colorado, May 11 and 20, 1903. One from wild plum. I had at first considered this a variety of *N. crawfordi*, but it may be kept separate for the present, at any rate. It differs from *crawfordi* thus: A trifle smaller; no yellow whatever on head or thorax; middle of front black, with a red spot in front of anterior ocellus; flagellum red; apical part not blackened; thorax more hairy; tegulae entirely red; third submarginal cell nearly or not far from as broad above as second; basal nervure more basad of transverso-medial; legs without yellow, except a small obscure spot at base of anterior and middle tibiae; hind femora red, with a broad black stripe behind, not reaching either end, and on it a band of short yellowish hair; hind coxae with much black (only a little in *crawfordi*); base and apical margin of first abdominal segment black; pygidial plate narrower, venter ferruginous marked with yellow and black.

Nomada (Xanthidium) parivincta, new species.

A ♀ marked Colorado, without definite locality.

Length $10\frac{1}{2}$ mm.; ground-color of head and thorax black; labrum yellow, with a small reddish spine; mandibles pale ferruginous, with black tips; face below antennæ yellow; the upper part of clypeus, and upper part of supraclypeal area, ferruginous; front with ferruginous bands continued from the lateral face marks, strongly curving inwards; a red spot before middle ocellus; posterior orbital margins rather broadly red; scape ferruginous behind, bright yellow in front; flagellum ferruginous, the last six joints strongly blackened, the extreme apex red; fourth antennal joint much longer than third; mesothorax very coarsely and densely rugoso-punctate, its lateral margins yellow edged with ferruginous; upper border of prothorax, tubercles, scutellum, a spot at each anterior corner, postscutellum, and large quadrate marks on metathorax encroaching on enclosure, all bright yellow; pleura yellow, with a small black and red mark above, and a large black mark surrounded by red below; legs a lively red; hind coxæ with a large black mark behind and a yellow one above; anterior femora yellow in front and apically, middle femora with less yellow in front, but a large mark at apex, hind femora with a yellow stripe in front and a large black area behind; tibiæ yellow on outer side, hind tibiæ with a black stripe behind; basal joint of hind tarsi mainly yellow; tegulæ shining and sparsely punctured, ferruginous with a yellow spot in front; wings rather yellowish, apex clouded; stigma bright ferruginous, nervures brown; second submarginal cell very broad above, not far from square, receiving the recurrent nervure well beyond its middle; third a little broader below than second, but very greatly narrowed above, its outer margin strongly angled; basal nervure meeting transverso-medial; abdomen minutely rugulose, bright yellow, with the base of first segment, and three broad bands at the junction of the segments, black; hind margin of fourth segment reddish brown, fifth all yellow; venter yellow (reddish on sides of first segment) with three black bands on which are reddish stripes.

N. parivincta differs from *N. vincta* by the considerably larger punctures of the mesothorax, the color of the hind legs, the yellow of metathorax intruding on enclosure, the proportions of the antennal joints, etc. From *N. citrina* it differs by the narrower face, the broad third submarginal cell, etc. From *N. citrina* v. *rufula* by the narrower face, the blackened apical part of flagellum, etc. From *N. rhodoxantha* by the yellow scutellum, color of legs, etc. From *N. sulphurata* by the much narrower first segment of abdomen, broad third submarginal cell, etc. From *N. rivalis* by the markings of thorax and legs, etc.

Nomada parivincta variety **semirufula**, new variety.

A ♀ marked Colorado, without definite locality.

Mesothorax mainly dark red, with a broad median black band, and a good deal of black on the anterior and posterior margins; anterior lateral corners only yellow. Lower part of pleura with a large red patch without black; yellow marks on metathorax margined with red; first abdominal segment considerably broader, its basal half red with a blackish transverse band; venter with black bands only on the first and extreme base of fourth segments. This resembles *N. sulphurata* in the darkened apical part of flagellum, etc., but the first abdominal segment though broader than in the type, is by no means so broad as in *sulphurata*, while the colors of the mesothorax and ventral surface of abdomen, and the shape of the third submarginal cell, are quite different. The basal nervure in

semirufula begins well basad of the transverso-medial, as in *sulphurata* and not as in *perivincta*.

***Nomada gillettei*, new species.**

Named after Professor Gillette, who has done so much for Colorado entomology. The type is a ♂ marked Colorado 2198. Taken at Golden, July 3rd, by C. P. Gillette.

Length 9½ mm.; head and thorax black, densely and coarsely punctured; facial quadrangle considerably broader than long; front concave; labrum, basal half of mandibles, clypeus, very broad lateral face marks ending at level of antennæ, and broad marks beneath eyes, all chrome yellow; antennæ lively ferruginous, fourth joint much longer than third; scape quite swollen, yellow in front, and with a black dash and dot behind; hair of head and thorax scanty, white; upper border of prothorax, tubercles, V-shaped mark beneath, and a spot on each side of the lower part of metathorax, all yellow; scutellum with two minute red spots; legs a lively red, extreme base of anterior and middle tibiæ with an obscure yellowish spot; middle femora with a small black spot at extreme base; hind femora nearly all black behind; tegulæ punctured, whitish tinged with red; wings clear, yellowish along the nervures; stigma and nervures ferruginous; second submarginal cell broad above, receiving the recurrent nervure a little beyond its middle; third at least as broad as second below, but narrowed more than half above, its outer margin bent; basal nervure a short distance basad of transverso-medial; abdomen yellow, the bases of the segments black, their apical margins pale ferruginous; the yellow band on the first segment is interrupted in the middle by a reddish triangle pointing posteriorly; apical plate narrow, feebly notched; venter yellow, banded with dark reddish brown. The face is bare, without the beautiful appressed white hair seen in *N. elrodi*. The colors of the abdomen recall *N. civilis*.

***Nomada agynia*, new species.**

One ♂ sent by Prof. Gillette, marked Colorado 2196, Golden, July, C. P. Gillette, collector.

Length about 9 mm.: black with yellow markings; head broad, facial quadrangle about square; basal two-thirds of mandibles, labrum, clypeus, lateral face-marks (broad below, gradually narrowing to a point at top of eyes) and posterior orbits nearly to summit, all yellow; clypeus with the usual sutural black spots; supraclypeal mark obscure reddish, narrowly surrounded by black; antennæ not very long, third joint much shorter than fourth; scape stout, heavily marked with black on a red field above, yellow below (in front); flagellum dark ferruginous, blackish above, especially towards base; mesothorax dull, very densely and quite coarsely rugoso-punctate, the anterior lateral corners, and a few marks on lateral margin, red; upper border of prothorax, tubercles, scutellum and postscutellum, yellow; pleura red with a broad curved transverse yellow band, and a large black spot beneath; metathorax black in the middle, the sides (encroaching on the enclosure) variegated with red and yellow; tegulæ yellow, large, shining and rather sparsely punctured; wings quite long, hyaline, the apex blackened; stigma ferruginous, nervures fuscous; second submarginal cell broad below, but narrowed above; third broad below, and narrowed more than half above; basal nervure a short distance basad of transverso-medial; legs lively ferruginous, the hind femora and tibiæ darker, the hind femora black behind except at base and apex; middle femora somewhat swollen, with a blackish spot on apical half behind; knees, and a stripe on anterior tibiæ, yellow; abdomen rather broad, closely and minutely punctured; all the segments yellow with black bases and ferruginous apical margins, the yellow of the

first segment with a pair of small reddish sublateral marks; apical plate narrow, truncate, with the faintest suggestion of an emargination; venter yellow with blackish and reddish bands.

This is possibly the ♂ of some described species, but after repeated comparisons, I cannot satisfactorily assign it to any. In my table in Proc. Acad. Nat. Sci. Phila., 1903, p. 559, it runs to *pascoensis*, which it superficially resembles, but it is easily known from that by the quite ordinary last antennal joint, the light marks on metathorax, etc.

***Nomada pallidella*, new species.**

One ♂ marked Colorado 566 (Montrose, June 24, 1902, C. P. Gillette, collector).

Length about $7\frac{1}{2}$ mm.; black, marked with pale yellow; quite hairy. Facial quadrangle about square: labrum, mandibles except tips, narrow stripe beneath eyes, clypeus and lateral face-marks, yellow, lateral face-marks reduced to a triangle at lower corners of face, which sends a line upwards along orbital margin nearly to level of antennæ; antennæ long, scape ordinary, yellow in front; third joint much shorter than fourth; flagellum dark ferruginous, blackened above; mesothorax dull and very densely rugoso-punctate; tubercles, a small mark on anterior part of pleura, and two spots on scutellum, yellow or yellowish tinged with reddish; metathorax entirely black; hair of dorsum of thorax brownish; tegulæ ferruginous, punctured; wings iridescent, dusky at tips; stigma ferruginous, nervures fuscous; second submarginal cell broad above, third greatly narrowed above; basal nervure meeting transverso-medial, but a little on the basal side; legs red without any yellow; basal half of anterior femora behind, most of basal two-thirds of middle femora behind and beneath, and all of the hind femora except apex, black; hind tibiæ with a blackish dash on inner side; abdomen minutely roughened; light yellow bands on segments two to six not interrupted, but those on four and five enclosing laterally a dark spot; band on first segment with a rather broad median ferruginous interruption, the area posterior to the band also being ferruginous, with two blackish dots; otherwise, the dark parts of the abdomen are black or almost so; apex with long hairs; apical plate quite broad, deeply notched; venter red-brown, with yellow bands bent in the middle and not reaching the lateral margins.

From Robertson's *N. salicis* and *N. simplex* (♂s) this is readily separated as follows:

Apex of abdomen strongly notched..... 1.

Apex of abdomen slightly notched; scutellum black..... *simplex*.

1. Legs marked with yellow *salicis*.

Legs not marked with yellow..... *pallidella*.

The Californian *N. subangusta*, Ckll., is very near to *N. pallidella*, but it has the first abdominal segment narrower; the abdomen, where not yellow, mainly red; the scutellum entirely black, the second submarginal cell narrower; and the red of the flagellum much brighter. In the face-marks, hairy thorax, etc., they agree.

From *N. modocorum*, Ckll., *N. pallidella* is easily known by the much narrower, parallel-sided abdomen, with much paler markings, those of *modocorum* being bright yellow.

***Nomada sayi*, Robertson.**

One ♀ collected by E. S. G. Titus at Virginia Dale, Colorado, July 24, 1899, from wild geranium. The date seems too late for *sayi*, and the specimen is hardly typical; it is not *N. lehighensis*, which flies in July. Probably when we have a good series of the Colorado insect, including both sexes, it will be possible to separate it subspecifically, at least.

Nomada coloradella, new species.

A pair; ♂, Fort Collins, Colorado, June 18, 1900; ♀, Colorado 633 (Dolores, June 18, '92, C. P. Gillette, collector).

♂; length $5\frac{1}{2}$ mm.; head and thorax black, with abundant white hair; labrum, mandibles except tips, clypeus and lateral face-marks, bright yellow; lateral face-marks consisting of triangles occupying the lower corners of face, sending a line upwards to level of antennæ; facial quadrangle somewhat broader than long; antennæ very long; scape moderately stout, yellow in front and black behind; third joint much shorter than fourth; flagellum submoniliform, pointed at apex, bright light yellowish-ferruginous, the first four joints black above; tubercles and tegulæ reddish-testaceous, scutellum with two reddish spots, thorax otherwise all black; wings clear, dusky at apex; nervures and stigma yellowish-ferruginous, marginal cell long; second submarginal broad above, receiving the recurrent nervure far beyond its middle; third submarginal very broad below, greatly narrowed above, its outer margin strongly bent; basal nervure meeting transverso-medial (in *N. sayi* it is a long distance basad of it); legs red, the femora blackened behind and beneath; abdomen ferruginous, basal half of first segment black; a bright yellow band, interrupted in the middle, on segments 2 and 3; yellow hardly apparent on 4, but prominent on 5 and 6; apex with long hairs; apical plate moderately notched; venter ferruginous.

♀; length about 6 mm., red, mesothorax and metathorax each with a single black band; ocelli on a black patch, but front all red; antennæ red, scape with a blackish apical spot on inner side; third antennal joint about as long as fourth; first segment of abdomen practically without black; basal nervure meeting transverso-medial, but on the basad side. The ♂ is to be regarded as the type; it is not quite certain that the ♀ belongs to it, but it is probable enough to justify the association for the present. The ♂, in its color and markings, is like *N. sayi*, but it is easily distinguished by the venation. It differs from *N. rhodosoma* by its smaller size and much lighter antennæ and stigma; from *N. oregonica* by its light orange stigma, and apical half of flagellum not black above; from *N. lehighensis* by its smaller size, and quite different color of antennæ and stigma; from *N. pygmæa* by the absence of supraclypeal mark, and orbits not ferruginous. It is also allied to *N. illinoiensis*. The ♀ resembles *N. rhodosomella*, but is separated by the characters given in the table.

Nomada luteopicta, new species.

Two ♂s and a ♀ collected by Prof. Gillette; all Palisades, Colorado, May 7, 1901, from apple blossoms.

♂; length about $6\frac{1}{2}$ mm.; head and thorax black, with abundant white hair; labrum, mandibles except tips, narrow stripe beneath eyes, clypeus and lateral face-marks (consisting of a triangle at lower corners of face, sending a line upwards to level of antennæ) all bright-yellow; eyes green; antennæ long, scape rather swollen, yellow in front and black behind; third joint shorter than fourth; fourth shorter than last; flagellum bright clear yellowish-ferruginous, the first four joints black above; tubercles, tegulæ, upper border of prothorax, mark on anterior part of pleura, and two clearly-defined oval spots on scutellum, yellow; wings slightly dusky, apex darker; stigma dark ferruginous, nervures fuscous; second submarginal cell very narrow, or broadened below by the lengthening of the lower basad corner, in which case the recurrent nervure is received much beyond its middle; third submarginal extremely broad below, narrowed more than half above, its outer side strongly bent; basal nervure meeting transverso-medial; legs red, middle and hind coxæ mainly black; middle femora with a black stripe beneath, hind femora mostly black behind; all the knees broadly, and apex of hind tibiæ, yellow; abdomen yellow, the segments ferruginous on apical margin, and more or less black basally; apex with long hairs, apical plate very feebly notched;

venter yellow, ferruginous at base, and with the hind margins of the segments broadly pale ferruginous.

♀; red; mesothorax and metathorax with a median black band; third antennal joint not greatly shorter than fourth; abdomen red, not black at base; second and third segments with a subquadrate bright yellow spot on each side, third also with a pair of yellow dots mesad of the spots, fourth with a yellow band, not reaching lateral margins, fifth with a short broad band; venter without yellow.

The ♂ is to be considered the type. It is closely allied to *N. coloradella*, but larger, with a broader abdomen, with much more yellow. The ♀ is very near to *N. lewisi*, Ckll., but has no yellow at lower corners of face; and has the third submarginal cell much broader. The scutellum of the ♀ is low and scarcely bilobed, as in *N. simplex*, Rob., which is closely allied; but *simplex* has much more black on the head and thorax, and the fourth abdominal segment spotted instead of banded.

***Nomada coloradensis*, Cockerell.**

A pair; the ♂ marked Fort Collins, Colorado, foothills, May 19, 1900, E. S. G. Titus, collector: the ♀ marked Colorado 566, just like the original type. Taken June 24, 1892, at Montrose, by C. P. Gillette. At Milwaukee, Wisconsin, Dr. Graenicher has taken a form of *N. coloradensis*, which may prove to be subspecifically separable.

The ♂ has not been described. It is very similar to several ♂s, from which it is readily separated as follows:

- | | |
|---|--|
| Scape conspicuously swollen, apical plate broad | 1. |
| Scape ordinary; venter red not spotted with yellow; apical plate narrow | 3. |
| 1. Pleura with much red; metathorax with four red spots; venter with large yellow markings..... | <i>bethunei</i> Ckll. |
| Pleura and metathorax without red (or pleura with a small red mark) | 2. |
| 2. Venter spotted or banded with yellow..... | <i>vicinalis</i> Cresson. |
| Venter red without yellow. | <i>vicinalis</i> var. <i>infrarubens</i> Ckll. |
| 3. Larger; mesothorax marked with red; first abdominal segment with a yellow band | <i>armatella</i> Ckll. |
| Smaller; metathorax all black; first abdominal segment without a yellow band | <i>coloradensis</i> Ckll. |

I am greatly indebted to Mr Rehn for the information that Cresson's type of *N. vicinalis* has the apical plate of abdomen broad, scape normal, base of metathorax more granulose than rugulose, labrum with a very slight median denticle.

N. vicinalis infrarubens is a new variety obtained by Prof. Cordley at Corvallis, Oregon, June 6, 1899. It has the following noteworthy characters; labrum very hairy; ends of linear upward prolongation of lateral face-marks slightly bending from orbits; flagellum bright red, the last joint pointed, the first five joints black above; hair of upper part of thorax (especially scutellum) strongly brownish; tubercles reddish with a yellow spot; tegulae, scutellum, two stripes on mesothorax, and a small mark on lower part of pleura in front, red; first abdominal segment with basal half black, with two red marks; yellow bands on segments 1 to 5 broadly interrupted by red in the middle; sixth segment with a short bilobed yellow band; apical plate very hairy. The antennae remind one of *N. pascoensis*, but the insect is otherwise very different.

***Nomada alpha*, new species.**

One ♀ taken by F. C. Bishopp, marked Fort Collins, May 20, 1903, Colorado. Taken from flowers of *Capsella bursa-pastoris*.

Length about 8½ mm.; head and thorax red, with black and yellow markings; abdomen red and yellow. Front depressed, coarsely an

closely punctured; facial quadrangle much broader than long; mandibles very shiny, pale reddish with black tips and more or less yellow bases; labrum, clypeus, and sides of face on each side of clypeus, yellow, the yellow not sharply defined from the red just above; ocelli on a black patch, connected with a black patch on front, but leaving a red mark in front of middle ocellus; frontal patch sending black bands to sides of clypeus, these and the narrowly blackened upper clypeal suture making a large A; posterior orbital margins very broadly red, with a large yellow stripe on the lower two-thirds; antennæ long, red without any black, scape yellowish in front; third joint longer than fourth; mesothorax coarsely rugoso-punctate, red with three rather ill-defined black stripes; prothorax black, with its upper border, and the tubercles, yellow; pleura red, with a black spot beneath; a broad black band from wings to middle and hind coxæ; scutellum red suffused with yellow; postscutellum bright yellow; metathorax black, with a large red spot on each side; tegulæ red; wings yellowish, apical margin not much darker than the rest; stigma bright orange-ferruginous, nervures pale brownish; second submarginal cell moderately narrowed above; third of the narrow type; basal nervure a long distance basad of transverso-medial; legs bright red, anterior and middle femora with more or less of a yellow apical spot; hind femora wholly without black; abdomen very minutely rugoso-punctate; first segment red with a transverse yellow mark on each side; second red with very large pyriform yellow marks; third similar, but with even more yellow; fourth yellow except extreme base and apical margin; fifth yellow; venter banded with yellow and red.

In Robertson's tables this runs to *Holonomada*, but it is closely related to some of the species which are referred to *Xanthidium*.

***Nomada libata*, Cresson.**

This is erroneously called *limbata* in Dalla Torre's Catalogue. Mr. Rehn has kindly examined Cresson's type ♂, and finds the apical plate rather narrow, deeply notched; the ventral surface of abdomen immaculate except the apical margins of the three terminal segments, which are yellow to a considerable degree; scape normal.

These characters are in part similar to those of *N. armatella*, which may be known from *libata* by the absence of yellow on venter and the basal nervure far basad of transverso-medial (in *N. libata*, *parata*, *bethunei* and *coloradensis* it is only a little basad of it).

***Nomada dilucida*, Cresson.**

Mr. Rehn has kindly examined Cresson's type ♀, and finds it differs structurally from *N. morrisoni* thus: labrum narrower, more rectangular; scape heavier and more robust; abdomen glabrous instead of pubescent.

I am extremely indebted to Mr. Viereck, who has most kindly examined all of the types in the collection at Philadelphia, and reported on the venation and proportions of the third and fourth antennal joints.

***Nomada frieseana*, Cockerell and *N. semiscita*, Cockerell.**

These two species were discovered at Colorado Springs since this paper was written, and described in *Annals & Mag. of Nat. Hist.*, July 1904. *N. frieseana* is allied to *N. rubicunda*, and *N. semiscita* to *N. scitifformis*.

