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## The Bees of Southern California

T. D. A. Cockerell

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"Some Recent Literature Relating to the Nervous System," Dr. Louisa Burns.

"Comparative Anatomy of Teeth and Skulls of Mammals," Dr. Bebb.

Aside from the formal papers brief reports were made as follows: Prof. A. B. Ulrey. Report. On some Organisms Collected in West-lake Park.

Hybrid Fishes, Prof. A. B. Ulrey.

Some Peculiarities of Cell Structure, Prof. A. B. Ulrey, Prof. C. A. Whiting.

## 2. Section of Geology.

Report of the proceedings of the Geological Section of the Academy of Sciences, from September 1904 to and including May, 1905:

Oct. 24th, 1904 Mr. J. B. Lippincott read a paper on the "Reclamation Service of the U. S. Geological Survey".

Nov. 28th, 1904. Prof. W. L. Watts gave a lecture on the "Geology and Physical Geography of Southern Mexico", and Geo. W. Parsons gave a description of a recent trip to the City of Mexico and the surrounding country.

Jan. 23d, 1905. Prof. W. C. Mendenhall gave a lecture on the work of the U. S. Geological Survey with special reference to our watersheds and water supply.

Feb. 27th, 1905. Prof. Robt E. Ford gave a lecture on "How We Get Our Iron and Steel".

Mar. 27th, 1905. Rev. H. B. Gage gave a lecture on the minerals of Riverside County.

April 24th, 1905. L. Douglas Sovereign gave a lecture on "Gems and Curiosities of Southern California".

May 22d, 1905, open meeting George W. Parsons gave an interesting talk on the necessity of good roads, good water and water sign posts on the desert, and great necessity of all for proper development of the country's mineral and agricultural resources.

G. MAJOR TABER, Secretary.

GEO. W. PARSONS, Chairman.

## 3. Section of Botany.

The Botanical Section has held five meetings this year at which the following papers have been read:

"Flora of Clifton, Arizona," by Dr. A. Davidson.

"Desert Flora near Thermal," by Theodore Payne.

"The Californit Palm in Los Angeles," by Dr. A. Davidson.

"On San Jacinto Trails," by Mrs. Blanche Trask.

"Notes on the Flora and Fauna of Catalina Island," by C. F. Baker.

"The Flora of Amador County," by Ernest Praunton.

"History of the Forestry Station, Santa Monica," by A. Campbell-Johnston.

C. RUSSELL, Secretary.

## The Bees of Southern California.

BY T. D. A. COCKERELL.

### *Emphoropsis interspersa*, n. sp.

Male. Like *E. floridana* (Smith), but clypeus and lateral marks white; hair of cheeks long and white; hair of mesothorax strongly mixed with black; anterior femora with long white hairs behind; hind tibiae with white hairs on outer face; apical plate of abdomen extremely narrow.

**Hab.**—California (no other particulars known); from the Cresson collection, loaned by Mr. Viereck.

### *Emphoropsis semifulva*, n. sp.

Male. Like *E. floridana* (Smith), but lateral face-marks better developed (more filled in above); strip on mandibles and scape in front cream-color; hair of cheeks long, abundant and white; hair of thorax above fulvous, that of mesothorax with black intermixed; hair of legs white, of middle trochanters and femora black (hind legs lost in type); hair of abdomen beneath largely pallid, at least in certain lights; apical plate broad, margined on each side with light fulvous pubescence. The hair of the region just above the hind coxae is black.

**Hab.**—California (no other particulars known); from the Cresson collection, loaned by Mr. Viereck.

The following table will be useful in the separation of the species of *Emphoropsis*. I give also *Anthophora abrupta*, which is easily confused with some of the forms of *Emphoropsis*.

Entirely black, with black pubescence.....*tristissima* (Ckll.)  
Pubescence of thorax at least mainly light.....1.

1. Abdomen with conspicuous entire light hair-bands.....2.  
Abdomen without such bands.....3.

2. Clypeus all black (females).....*salviarum* (Ckll.)  
Clypeus with a reversed T in white (males) *salviarum* (Ckll.)

3. Abdomen not bicolored, but with a rather thin pale pubescence all over.....4.

Abdomen bicolored, i. e. black with the base hairy.....6.

4. Clypeus, supra-clypeal mark, lateral face marks, and front of scape creamy-white (males).....*johnsoni* (Ckll.)  
Clypeus black, with at most (in *miserabilis*) a small light spot.....5.

5. Hair of thorax profusely mixed with black; of hind tibiae on outside white (females).....*miserabilis* (Cr.)

Hair of thorax yellowish-white, with a black patch in middle; of hind tibiae on outside orange (females)

.....*johnsoni* (Ckll.)

6. Clypeus black (females).....7.  
Clypeus mainly or wholly light (males).....9.
7. Hair of thorax above with black intermixed; of occiput  
pale, but some black on vertex.....*murihirta*, Ckll.  
Hair of thorax above without black intermixed.....8.
8. Hair of occiput and cheeks all black....*floridana* (Smith)  
Hair of head pale, mixed with black on face and vertex;  
hair of thorax above bright orange-fulvous.....  
.....*pascoensis* (Ckll.)
9. Sides of clypeus broadly black; scape all black; hair  
of thorax above with black intermixed..*murihirta*, Ckll.  
Clypeus not thus margined.....10.
10. Hair of thorax above fulvous or ochreous, with black  
conspicuously intermixed.....11.  
Hair of thorax above without black intermixed.....12.
11. Hair of abdomen beneath all black; scape entirely  
black .....*interspersa*, Ckll.  
Hair of abdomen beneath largely pallid, at least in  
certain lights; scape white in front.....*semifulva*, Ckll.
12. Scape all black; hair of cheeks black; hair of hind  
tibiae on outside black.....*floridana* (Smith)  
Scape white or yellowish in front.....13.
13. Hair of cheeks white; hair of hind tibiae on outside  
white .....*morrisoni* (Cresson)  
Hair of cheeks black.....*Anthophora abrupta*, Say.

Of all of the above, except the *Anthophora*, I have studied types or cotypes.

*Synhalonia belfragei* subsp *virgata*, subsp. nov.

Female. Length about 12 mm., with a broad abdomen. Black; head and thorax with abundant pale pubescence, white on cheeks, pleura and face, slightly stained with ochreous on vertex and labrum, decidedly ochreous (without any black) on mesothorax and scutellum; mandibles above and below with some long golden or orange hairs; eyes (dry) dark grey-brown; facial quadrangle broader than long, but not excessively broad; vertex dullish, minutely roughened and punctured; antennae black, last joint slightly longer than the one before; mesothorax dull (as in *melissodes actuosa*), minutely roughened and malleate; tegulae very dark brown, minutely punctured; wings clear basally, the apical part distinctly dusky; nervures piceous; second submarginal cell very broad, receiving the recurrent nervure near its end; wings quite hairy; legs black, hair on inner side of tarsi ferruginous; hair on apical half of middle tibiae pale fuscous; basal joint of hind tarsi broad, its large apical hair-tuft fuscous with a ferruginous base;

hind knee-plate very small; tuft of hair on hind knees pale rufous; hind spurs long and perfectly straight; first abdominal segment with long hair; basal part of second to fourth with short pubescence which gives a grey surface with numerous little black specks, but extreme base of third and fourth, as well as of fifth, perfectly black; apical part of 2 to 4 with a broad band of rather silky dull white tomentum, narrowest on second; 5 has a similar band, but it is broadly stained in the middle with fuscous; apical plate obconical, rather broad, with perfectly even sides, the hair on each side of apical plate obconical, rather broad, with perfectly even sides, the hair on each side of it fuscous, shading into a warm red; venter with pale hair, stained with fuscous in middle of penultimate segment; second ventral segment chestnut red. Differs from typical *S. belfragei* (an Illinois specimen compared) by the strong ochreous tint of the hair on the thorax above; the darker, duller, punctured tegulae; the absence of a yellow tint in the wings and the broader second submargined cell. Differs from *S. fowleri* by the broader abdomen, with the bands not so white and not quite so broad; also by the color of the thoracic pubescence, and the very much larger second submarginal cell. Differs at once from *S. acerba* by the light hair of the legs; from *S. edwardsii* by having three white abdominal bands; from *S. fulvitaris* by the light pubescence of head.

**Hab.**—Los Angeles, Calif., two specimens (Davidson).

*Melissodes stearnsi*, n. sp.

Female. Length 10 mm. or slightly more; black with dull white pubescence, tinged with ochreous on anterior part of mesothorax, tubercles, and slightly on abdomen; facial quadrangle about square; eyes (dry) pale greenish; clypeus with large punctures; antennae from middle of fourth joint to end ferruginous beneath; last joint a trifle shorter than penultimate; mesothorax shining, strongly and closely punctured at the sides, impunctate in the middle; posterior two-thirds of mesothorax, and scutellum (which is well punctured) nude, or the extreme sides of these parts may have ochraceous hair, but there is no black hair; tegulae very dark brown, the tuft of pubescence pale; wings dusky, nervures piceous; second submarginal cell broad, receiving the recurrent nervure not far from the end; legs black, claw-joints red; hair of legs pale, that on inner side of basal joints of tarsi black; scopa of hind legs large, in the type full of orange pollen; abdomen convex and rather parallel-sided, not broad; first segment with pale hair on the basal half; segments 2 to 4 covered with appressed

greyish-white pubescence, often abraded; segments five and six with the pubescence mostly ochreous; the abdomen appears pruinose, but not banded; apical plate with the lateral margins concave; hair of venter pale reddish. A rather inconspicuous little species, not much like anything known to me.

**Hab.**—Los Angeles, Calif., two; Redondo, Calif., one, all collected by Dr. Davidson. Named after Dr. R. E. C. Stearns, the veteran naturalist of Los Angeles.

***Melissodes intermediella*, n. sp.**

Female. Length 10 mm. or slightly less; pubescence pale greyish or greyish-white; the broad bands of appressed hair on abdominal segments 2 to 4 white, not in the least ochreous; mesothorax shining and sparsely punctured, its hind part in the middle, and the disc of scutellum, covered with black hair; hair on inner side of basal joint of hind tarsi brown-black; hind knee-plate very short; pleura with long white hair; tegulae with a tuft of pale hair; second submarginal cell very broad, receiving the recurrent nervure beyond the middle, but not near the end; flagellum, except at base, dark red beneath; vertex without black hair; facial quadrangle broader than long, but not excessively broad.

This is the so-called *M. intermedia*, Cresson, of the Mesilla Valley, New Mexico. By reason of the black hair of the apex of the abdomen, it cannot be the true *intermedia*. An account of its maxillary palpi is given in *Annals and Magazine of Natural History*, Oct. 1903, p. 448. It is closest to *M. humilior*, Ckll., of which it may possibly prove to be a variety, but the evidence now available suggests that it is distinct. A specimen from Los Angeles, Calif. (Davidson) must be referred to *M. intermediella*. It is remarkable for the very shiny vertex, the brighter red of the under side of the flagellum, and the hind margins of the first three abdominal segments broadly reddish-brown. It is possible that it may be separated as a local race, but this cannot be determined without more material.

***M. intermediella*, var. *catalinensis*, n. var.**

A female collected by Dr. Davidson on Catalina I., Calif., has much black hair on vertex, and the hair of the anterior part of the mesothorax has a decided ochreous tint. The abdominal bands also have an ochreous tint, and the stigma and nervures are black or nearly so. The wings are dusky, considerably darker than in the type. The flagellum, except at base, is bright ferruginous beneath. The hind margin of the first abdominal segment is very narrowly brown, but the margins of the second and third are black. This may be a distinct species.

***Melissodes gilensis*, Cockerell.**

San Pedro, Calif., July 11. (Cockerell). New to California.

***Melissodes grindeliae*, Cockerell.**

La Jolla, Calif., August (Cockerell). New to California.

The females of several species described or recorded above can be easily separated by the following table. I add also a species from Arizona.

- |   |                                    |
|---|------------------------------------|
| Hair of fifth abdominal segment black or purple-black, except sometimes at extreme sides.....   | 1.                                 |
| Hair of fifth abdominal segment pale, sometimes dusky in the middle.....  | 5.                                 |
| 1. Hair of the thorax above fulvous, without black (Phoenix, Ariz., Oct. 8, at flowers of <i>Helianthus annuus</i> ).....                                     |                                    |
| ..... <i>Melissodes aurigena</i> , Cresson.   |                                    |
| Hair of thorax above with much black.....   | 2.                                 |
| 2. Larger; hair on inner side of hind tarsi clear ferruginous (San Pedro).....  | <i>M. gilensis</i> , Ckll.         |
| Smaller; hair on inner side of hind tarsi black or dark brown.....  | 3.                                 |
| 3. Tegulae with a tuft of black hair; subcostal nervure black or almost (La Jolla).....   | <i>M. grindeliae</i> , Ckll.       |
| Tegulae with a tuft of light hair, subcostal nervure ferruginous; flagellum ferruginous beneath except at base....  | 4.                                 |
| 4. Vertex without hair (Los Angeles)....  | <i>M. intermediella</i> , Ckll.    |
| Vertex with much hair (Catalina I.).....  |                                    |
| ..... <i>M. intermediella</i> v. <i>catalinensis</i> , Ckll.  |                                    |
| 5. Larger; hair on inner side of basal joint of hind tarsi clear ferruginous; hair of fifth abdominal segment with a blackish median stain (Los Angeles)..... |                                    |
| ..... <i>Synhalonia belfragei</i> subsp. <i>virgata</i> , Ckll.   |                                    |
| Smaller; hair on inner side of basal joint of hind tarsi black or almost.....   | 6.                                 |
| 6. Flagellum comparatively long, and clear red beneath (Los Angeles and Redondo)....  | <i>Melissodes stearnsi</i> , Ckll. |
| Flagellum short and black (Los Angeles).....  |                                    |
| ..... <i>Diadasia laticauda</i> , Ckll.   |                                    |

***Diadasia laticauda*, n. sp.**

Female. Length 9 mm. or slightly more; black, head and thorax with whitish hair, slightly tinged with ochraceous dorsally; mandibles with a golden patch near end; clypeus with very large strong punctures; antennae short, black, the flagellum having only a faint brown tinge beneath; mesothorax shining, with rather strong punctures, wanting in middle, sparse near middle, more dense anteriorly; scutellum with

close small punctures; tegulae shining dark reddish-brown; wings nearly clear; second submarginal cell strongly narrowed above, and receiving the first recurrent nervure about the beginning of its last third; spur of middle tibiae moderately hooked at end; spurs of hind tibiae slightly bent at the end; hair on inner side of basal joint of hind tarsi chocolate color; abdomen very broad, even basally; first two segments shining, with little pubescence, third to fifth more or less covered with appressed ochreous hair; hind margins of second to fourth segments with conspicuous narrow pale ochreous hair-bands; margin of fifth segment, and apex, with ferruginous hair. Easily known from *D. diminuta*, Cresson, by the much broader abdomen, shiny and mainly naked at base, the naked hind part of mesothorax, and scutellum (the hairy anterior third of mesothorax contrasting), the olive-green eyes (blue-grey in *diminuta*), the stouter middle spurs, etc.

**Hab.**—Los Angeles, Calif. (Davidson). It appears that the spurs offer specific characters in *Diadasia*; thus in *D. enavata* the spur of middle tibiae is straight, at most a little bent at the end, while in *D. australia*, *rinconis* and *opuntiae* it is strongly hooked.

*Diadasia nitidifrons*, n. sp.

Male. Length about 8½ mm.; black, shining, with long loose dull white hair, not hiding the shining surface; eyes dark, probably purplish in life; clypeus with many small punctures; a low keel-like prominence between the antennae; antennae entirely dark; mesothorax shining, with numerous minute punctures; scutellum punctured like mesothorax; tegulae warm reddish brown; wings clear; second submarginal cell narrow, narrowed above, and receiving the recurrent nervure near its end; middle and hind femora, and hind tibiae incrassate; basal joint of hind tarsi curved, pointed but hardly produced apically; abdomen cordiform or obconical, shining black, with thin erect pale hair, hind margins of the segments very narrowly pallid, no hair-bands, apex bituberculate. Cannot be the male of *D. laticauda*, because of the quite different character of the punctuation of the mesothorax. It is easily known from *D. diminuta* and *D. apacha* by the much less hairy abdomen, appearing black to the naked eye instead of whitish. It differs from *D. afflicta* by not having the basal joint of hind tarsi prolonged, and the quite different pubescence of the abdomen.

**Hab.**—Banning, Calif. (Davidson). It may be remarked that *D. tricineta*, Provancher, from Los Angeles, is placed by Fowler as a synonym of *D. enavata*; I do not believe this can be correct, but I am unable to see, from the description, wherein *D. tricineta* differs from *D. afflicta*.

*Melissodes nigrifrons*, Cresson, from California, is a species I have not seen. It may prove to be a *Diadasia*, as the description almost exactly agrees with *Diadasia nerea*, Fowler, differing, however, in having the flagellum subtestaceous beneath, and the pale hair of the abdomen confined to the first segment.

*Synhalonia idiotes*, n. sp.

Female. Length about 15 mm.; black, head and thorax with rather long pubescence, pale ochraceous dorsally, white beneath, nowhere mixed with black; head broad, facial quadrangle a little broader than long; clypeus entirely black, coarsely rugoso-punctate; antennae dark, flagellum dark reddish beneath toward apex; third joint about as long as fourth and fifth together; labrum with reddish-orange hairs; mandibles black, blunt and simple; blade of maxilla about as long as eye; sixth joint of maxillary palpi narrower, but not shorter, than fifth; eyes (dry) dark greyish-brown; mesothorax microscopically roughened or tessellate, with distinct, well-separated, shallow punctures; scutellum more shining, with very close, minute punctures, variable in size; base of metathorax minutely roughened and dull; pleura closely punctured on a minutely roughened surface; tegulae dark reddish; wings somewhat dusky, quite hairy, the nervures dark brown; basal nervure meeting transverso-medial; first recurrent nervure joining second submarginal cell at its extreme apex; legs black, with long pale pubescence, that on the inner side of the tarsi orange-ferruginous; scopa of hind legs coarse, little plumose; spurs light reddish-brown, simple; knee-plate of hind legs very large, elongate and pointed, almost half the length of the tibiae; claws with divergent denticles; abdomen closely punctured, the hind margins of the segments strongly rufescent; first segment with long pale hair; segments 2 to 4 covered except apically with a dense tomentum, which is white basally (especially towards the sides), shading into pale grey, the whole giving the effect of narrow reddish and white bands running parallel, and separated by broader pale grey bands; fifth and apical segments with reddish-brown hair; hair of venter pale reddish, becoming whitish at sides.

**Hab.**—Rock Creek, California (Dr. Davidson, No. 72). A peculiar species, well distinguished from others by the short, broad blade of maxilla, the large elongate posterior knee-plate, and the absence of black basal bands on the abdominal segments. *S. idiotes* is the species recorded in Bull. So. Cal. Ac. Sci., IV, p. 14, as *melissodes* sp. from Rock Creek. It was taken for a *melissodes* before the palpi had been examined.



*Triepeolus coquilletti*, n. sp.

In Annals and Magazine of Natural History, Jan. 1904, p. 38, I recorded a female supposed to be *T. donatus* (Smith), collected by Mr. Coquillett in San Bernardino County, California. I have now compared it with genuine *T. donatus* from Maine, and it is certainly a distinct species, to be named as above. The differential characters are: Length about 10 mm.; pubescence of thorax and abdomen creamy-white; form much more slender; anterior and posterior bands on first abdominal segment broken only by linear interruptions, band on second segment entire.

## ERRATA:

Page 31. *Anthophora urbana* is printed twice, the second one should be, *Synhalonia acerba*.

Page 32. *Colletes gandialis* should be *gaudialis*.

## A Preliminary Synopsis of the Southern California Cyperaceæ.\*

BY S. B. PARISH.

= = Orifice of the beak entire, or at most emarginate: Species of difficult determination.

a. *Perigynia ovoid or obovoid*.

10. *Carex senta*, Boott, Ill. 4:174. W. Boott, in Wats. Bot. Cal. 2:242. Bailey, Proc. Am. Acad. 22:82.

Culms slender, rough on the sharp angles, 3 dm. tall; leaves 2-4 mm. wide, shorter than the culms; staminate spikes 1-2, sometimes with a very short spike at base; pistillate spikes 2-3, on short peduncles, 3-5 cm. long, 4-5 mm. thick; scales narrowly lanceolate, nearly as long as the perigynia, obtuse or subacute; perigynia obscurely 3-nerved on the outer face; achenes pale brown, orbicular, smooth, mucronulate.

Santa Inez Mts., above Santa Barbara; 350 Brewer, type. Santa Susana Mts., Feb. 1861; 218 Brewer. Near San Fernando, Feb., 1861; 218 Brewer. Cienega, Los Angeles Co.; Davidson, 1890. The Santa Susana Mts. are "near San Fernando" and the two specimens of 218 Brewer in the herbarium of the State University probably represent the same collection. Both are labeled "*C. Jamesii* Torr." and the first is so cited in the Botany of California. The species appears to have been seldom collected, but is probably confined to the coast region.

\*Continued from page 84 (this volume), No. 5, 1905.

PLATE XIII.

