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## New and Little Known Bees from California

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## New and Little Known Bees From California

By T. D. A. COCKERELL

The bees described and listed below are from the Baker collection, and were kindly transmitted to me by Professor Wm. A. Hilton. All are from Claremont or the vicinity.

### *Glossoperdita* gen. nov.

Like *Perdita* Smith in general structure and appearance, but mouth-parts enormously elongated, apparently not retractile, the end of the tongue reaching beyond tip of abdomen; maxillary palpi 6-jointed, slender and very short, about 300 microns long; maxillary palpi about 1280 microns from base of mouth-parts, the blade extending about 3200 beyond the palpi, but the labial palpi not correspondingly elongated, their ends only about 800 microns beyond insertion of maxillary palpi. Head narrow, facial quadrangle conspicuously longer than broad; facial foveæ elongate and deep, ending below about level of insertion of antennæ; b. n. falling far short of t. m.; second s. m. very broad (long) but much narrowed above; stigma small and narrow; marginal cell long for the group, broadly truncate at end.

### *Glossoperdita pelargoides* sp. n.

♀ Length about 5 mm.; not very robust; pubescence scanty, white; head and thorax blue-green, but the mesothorax only green in front, the greater part, as well as the scutellum, black; clypeus and supraclypeal area black, sparsely and distinctly punctured; the face apparently without light markings, but close inspection shows a broad shadowy pallescent band in middle of clypeus, and similar triangular pallescent lateral marks, hardly visible; flagellum bright ferruginous beneath except basally; front dull; mesothorax shining anteriorly, the median groove deep; pleura polished, shining; tubercles pale reddish, two small pale marks on upper border of prothorax; legs piceous, hairy, anterior knees and band on tibia pale yellowish, middle knees pale reddish; tegulæ reddish; wings short,

somewhat dusky, stigma and nervures pale sepia; abdomen orange-ferruginous, without markings above or below, hair at apex pale ochreous.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 227 part). Unfortunately the habits of this remarkable bee are unknown. *Glossoperdita* could be considered a subgenus of *Perdita*, but it seems distinct enough to deserve generic rank.

The other specimens collected by Baker at Claremont sent under 227, are marked as from flowers of *Rhus laurina*. They consist of *Perdita rhois* Ckll., and a single male *P. hypoxantha* Ckll., the latter presumably a stray, as the species is attached to *Adenostoma*. Also under 227 is a female of *P. albipennis* Cress., collected by Baker at Los Angeles, and bearing his number 691.

*Perdita ruficauda*, sp. n.

♀ Length about 5.5 mm., moderately robust, pubescence scanty; head and thorax dull olive green; head ordinary, inner orbits parallel; mandibles pale yellow suffused with reddish, the apex black; clypeus black, sparsely punctured, with a broad pale yellow median band, failing below; no supraclypeal mark; lateral marks pale yellow, triangular, produced above, ending in a sharp point on orbital margin at level of antennæ; flagellum pale fulvous beneath; tubercles yellow with a dark dot, and a pair of cuneiform yellow marks on upper border of prothorax; mesopleura shining; legs piceous, with anterior and middle knees, tarsi and tibiæ yellow, the latter dark behind; tegulæ pellucid; wings faintly reddish, stigma and nervures reddish-brown; stigma small and slender; marginal cell large, obliquely truncate at end; abdomen bright orange-ferruginous above and below, without markings, except a narrow dark stripe along lateral margins of second segment. Mouth-parts not especially elongated; labial palpi with first joint about 690 microns, the other three together about 290 microns. Maxillary palpi long and well-developed.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 229, 199). This superficially resembles *Glossoperdita*. In my tables of *Perdita* it falls near *P. chamaesarachæ*, from which it is at once known by the face-marks and the palpi.

*Halictoides mülleri* Ckll.

Both sexes were taken by Baker at Claremont.

*Hesperapis nitidulus* sp. n.

♂ Length a little over 6 mm.; shining black, with white hair; eyes pea-green; mandibles broad, red and notched at end; head large and broad; flagellum very obscurely reddish beneath; tegulæ piceous in front, testaceous posteriorly; wings hyaline, nervures and stigma dusky ferruginous; abdomen with rather thin hair-bands, near to *H. larrea* Ckll., but mesothorax with very minute regular punctures; area of metathorax dull and abdomen more shining. Easily known from *H. olivæ* Ckll. by the clearer wings and dark antennæ.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 229).

*Agapostemon californicus* Crawford.

Claremont (*Baker*). A male with the scape all dark; it usually has a yellow stripe in this species. *A. radiatus* Say was also taken by Baker at Claremont.

*Panurginus atriceps* (Cresson)

Mountains near Claremont (*Baker*; Pomona coll. 204).

*Andrena osmioides* sp. n.

♂ Length about 10 mm., robust, very hairy, looking like an *Osmia*; head, thorax and legs black, abdomen olive-green, the surface minutely granular, not polished or punctate; hair of head and thorax white, dullish and faintly creamy above, very long and abundant, forming an immense white beard over mouth; abdomen with erect or sub-erect pale hair, all over the surface but not dense, long on the first two segments, apex with pale soot-colored hair; legs with pale hair. Head extremely broad, facial quadrangle very much broader than long; malar space very short; cheeks very broad, obtusely angled behind below level of middle of eye; antennæ ordinary, third joint equal in length to next two combined; flagellum very obscurely reddish beneath; vertex dull, only shining on orbital margin; mesothorax dull, not punctate, but scutellum anteriorly shining; area of metathorax dull and granular, with long erect hairs like the adjacent parts; tegulæ piceous; wings dusky on apical mar-

gins; stigma narrowly lanceolate, very slender, ferruginous with dark margin; b. n. meeting t. m.; first r. n. joining second s. m. much before middle; second abdominal segment depressed less than a third; venter purplish.

*Habitat:* Claremont, California, at flowers of *Cryptanthe* (Baker; Pomona coll. 198). Easily known among the species with green abdomen by its large size, abundant long pale hair, and very slender stigma.

In the mountains near Claremont Baker took *A. mimetica falli* Ckll., and at Claremont *A. prunorum gillettei* Ckll.

*Andrena prunorum* var. *mariformis* v. n.

♀ Clypeus pale yellow with two black spots, exactly like that of a male. The hair on head and thorax above is fine fox-red; the abdominal hair-bands are pale fulvous. Scape partly red, especially at apex; flagellum wholly dark. Second abdominal segment with a large black discal patch.

*Habitat:* Claremont, California (Baker; Pomona coll. 207). This is not styloped. Can it be a partial gynandromorph? All the characters, including the antennæ, are those of a female, except the clypeus.

*Andrena peratra* sp. n.

♀ Length about 10.5 mm.; entirely black, with black hair, except perhaps partly on mesothorax, which is denuded in type; head very broad, facial quadrangle very much broader than long; malar space very short; process of labrum obtusely pointed; clypeus delicately roughened, with rather close weak punctures, no smooth line; front minutely striate; facial foveæ dark seal brown, occupying more than half the distance between antennæ and eye, ending below, far below level of antennæ; third antennal joint considerably longer than next two combined; flagellum obscure reddish beneath except at base; mesothorax dull, granular, with no distinct punctures; area of metathorax granular; pleura with long reddish-black hair; small joints of tarsi reddish; tegulæ piceous, largely ferruginous posteriorly; wings translucent reddish, not dark; stigma ferruginous, narrowly lanceolate, extremely slender; nervures fuscous; abdomen granular, without evident punctures, but moderately shining; second

segment depressed about a fourth; hair at apex reddish-black; ventral segments with long fringes of stiff black hairs.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 199). This may be compared with *A. nigerrima* Casad, from which it is readily known by the non-punctate abdomen and other characters.

A related but much larger species of the Los Angeles region is *A. subtristis* Ckll. This, according to Mr. Viereck, is a synonym of *A. nigra* Prov., and the specimens in the National Museum labeled *nigra* are this species. There is, however, some confusion, since Provancher's description indicates a smaller species (length .42 inch), with a smooth line in middle of clypeus (wholly wanting in *subtristis*, but present in the much larger *pertristis* Ckll.), wings smoky reddish (like *pertristis* rather than *subtristis*), and abdomen oval and brilliantly polished. This indicates a species unknown to me.

*Andrena auricoma* Smith

Claremont (*Baker*; Pomona coll. 197). Smaller than an Oregon specimen. *A. candida* Sm. was also taken by Baker at Claremont (Pomona coll. 198).

*Andrena plana* Viereck

Claremont (*Baker*; Pomona coll. 212). This is a little larger than Viereck's type, but is presumably his *plana*, having the very remarkable brownish velvet-like hair on thorax above, and the dull impunctate clypeus. The second abdominal segment has no apical depression. Superficially the species resembles *A. mustelicolor* Vier., but it is easily separated by the thoracic hair.

*Andrena opaciventris* sp. n.

♀ Length about 10 mm.; black, with fulvous hair, bright fox-red on thorax above; face and front with much fulvous hair, so that the dull granular surface of the clypeus is difficult to see; mandibles black, with a red spot at extreme base; process of labrum narrow at end, minutely notched; facial foveæ grayish-brown, about half as wide as distance between antenna and eye, difficult to see on account of the long overlapping hair; antennæ black, third joint 368 microns long, the next two together 384 microns; mesothorax and scutellum

dull, without distinct punctures; area of metathorax dull, defined by absence of hair; hair at sides of metathorax very long and curled; legs with pale hair, largely chocolate on outer side of middle and hind tibiæ, pale orange on inner side of basitarsi; spurs pallid; tegulæ black; wings slightly dusky, stigma ferruginous, nervures fuscous; b. n. meeting t. m.; first r. n. joining second s. m. about middle; abdomen broad, with a completely dull impunctate surface; first segment with long fulvous hair at base, and a patch on each side on hind margin; segments 3 to 5 with conspicuous entire fulvous hair-bands; apex with pale soot-colored hair, a sort of reddish-gray; second segment depressed about a third, but the depression obscure.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 197). Resembles *A. auricoma*, but very distinct by the opaque abdomen.

*Andrena chlorura* sp. n.

♀ Length nearly 8 mm.; olive green, the metathorax, legs and antennæ black; pubescence fulvous, bright fox-red on thorax above and tubercles; some thin black hair on front and vertex; process of labrum very broad and rounded; clypeus with sparse weak punctures; facial foveæ black, rather narrow, ending below at level of antennæ; third antennal joint longer than next two together, but not so long as next three; mesothorax dull, impunctate; area of metathorax dull; tegulæ piceous; wings dusky; stigma large, dark reddish; nervures fuscous; abdomen shining, impunctate, with thin narrow fulvous hair-bands on segments 2 to 4, but none on first; hair at apex black; second segment depressed about a third in middle, but very narrowly at sides.

*Habitat:* Mountains near Claremont, California (*Baker*; Pomona coll. 197). A pretty species, known among the green *Andrenæ* by its red hair and small size. In Viereck's tables of *Andrena* of the N. W. States it runs near to *A. chlorinella* Vier., from which it is quite distinct. According to Viereck (litt. 1907) *A. xanthostigma* Vier. is identical with *chlorinella*.

*Diandrena beatula* sp. n.

♀ Length 7 mm., or slightly over; olive green, with a minutely sculptured sericeous surface, not polished; pubescence dull white.

forming felt-like hair-bands on abdomen, weak on first segment, but broad and conspicuous on 2 to 4; hair at apex of abdomen very pale ochreous; mesothorax with thin felt-like pale ochreous hair, and a few long hairs intermixed; facial quadrangle broader than long; mandibles black; process of labrum deeply emarginate; facial foveæ light, with a slight ochreous tint; more than half as wide as distance from antenna to eye; apical two-thirds of flagellum bright red beneath; mesothorax dullish, granular; area of metathorax delicately plicatulate; tegulæ rufopiceous; wings faintly dusky; stigma dusky ferruginous, small and narrow; legs with white hair, hind tibiæ with a broad loose scopa; tegument of legs black; abdomen looking like that of the group of *Halictus* including *H. provancheri*.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 216). A pretty little species, allied to the next, but easily known by the dullish fasciate abdomen.

*Diandrena cyanosoma* sp. n.

♀ (Type.) Length about 8 mm.; head olive green, thorax and abdomen blue green, the abdomen almost blue; clypeus black, with the upper and lateral margins green, the junction of the black and green suffused with purple; mandibles black; pubescence dull whitish; slightly ochreous on head and thorax above, fuscous or black just behind ocelli and more or less on front, and long dark hairs on scape; process of labrum narrow, emarginate; antennæ dark, the flagellum only very obscurely reddish toward end; facial foveæ pale, quite broad; mesothorax dull and granular, with short hair, and some long ones intermixed; scutellum rugosopunctate, but glistening anteriorly; area of metathorax roughened with very delicate rugæ; femora olive-green; tibiæ and tarsi black; hind tibiæ with a long glistening pure white scopa beneath, but fuscous hair above (behind), and hind knee-tuft grayish fuscous; hind trochanters with a long white curled floccus; tegulæ piceous; wings dusky, stigma dark reddish, rather small; abdomen broad, without any distinct hair-band, though the fourth segment has a thin fringe; hair at apex soot-color.

♂ More slender, with the usual sexual differences. Clypeus and middle of face densely covered with long white hair, but some

long fuscous hair at sides of front and on scape; cheeks with long white hair; mesothorax and scutellum with thin long erect white hair; abdomen quite without bands, hair at apex dark grayish-fuscous.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 203, 229). A distinct species, readily known from *D. puthua* Ckll. (male) by the dark hair at apex of abdomen. The dull surface of the abdomen at once separates it from the two following species.

*Diandrena clariventris* sp. n.

♂ Length a little over 6 mm., robust, with broad-pyriform abdomen; head and thorax dull blue-green; legs black, the femora perhaps faintly metallic; abdomen polished, shining, very dark blue-green, the hind margins of the segments broadly subtranslucent brown; head very broad, facial quadrangle much broader than long; antennae only moderately long, flagellum dark reddish; face and front with pure white hair, hair of thorax also white, no dark hair on head or thorax; area of metathorax granular, faintly plicatulate basally, and with a faint median raised line; tegulae piceous; wings dusky; stigma and nervures reddish-fuscous, the stigma dark, not very large; hair at apex of abdomen very pale, with an ochreous tint.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 212). Allied only to the next species, which is much smaller. *D. chaelybæa* (Cress.), also taken by Baker at Claremont, has the abdomen shining blue.

*Diandrena scintilla* sp. n.

♀ Length about or hardly 5 mm., robust, with very broad abdomen. General characters as in *D. clariventris*, but much smaller; head nearly circular, seen from in front; flagellum very short and stout, the middle joints about twice as broad as long, dark reddish beneath; front shining, punctate; mesothorax and scutellum olive-green, shining, with distinct minute punctures; area of metathorax concave, finely striatulate; stigma and nervures paler than in *D. clariventris*, and wings not so gray; punctures on second abdominal segment sparse; hair at apex of abdomen light ferruginous.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 213). Close to *D. clariventris*, but certainly distinct, the sculpture of the thorax being quite different.

*Conanthalictus bakeri* Crawford.

♂ About 4 mm. long; hair at apex of abdomen reddish-gray, abundant. The six-jointed maxillary palpi are very long and slender, and the tongue is linear, quite long, with very long hairs.

♀ I made the following notes from Crawford's type in U. S. National Museum. Dull green abdomen, hind margins of segments pale reddish; head round seen from in front; front dull bluish green; long hairs over clypeus like a moustache; mesothorax not evidently punctured. Has the short elevated clypeus of genus, but head differently shaped. The Claremont specimen shows a well-developed tibial scopa.

Two males and a female are before me, from Claremont (*Baker*; Pomona coll. 199, 216). The genus seems nearest to *Paralictus* Rob., but quite distinct. Both are without the caudal rima in female.

*Conanthalictus macrops* sp. n.

♂ Length slightly over 4 mm., but more robust than *C. bakeri*, with the reddish hind margins of abdominal segments fringed with white hair except in middle; head very broad, the facial quadrangle much broader than long; mandibles broadly red at apex; antennæ short, entirely dark; cheeks rather broad, with a depressed, dimple-like area; front completely dull, but mesothorax somewhat shining, though not polished; wings strongly dusky; stigma dark reddish, rather small; nervures fuscous; second s. m. very narrow; femora green, tibiae and tarsi black, with white hair. The green color, fine sculpture, etc., are as in *bakeri*. The abundant hair at apex of abdomen is pale dusky reddish.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 199). Known from all other members of the genus by the very broad head. The large black eyes are parallel.

*Augochlora pomoniella* Ckll.

Both sexes from Claremont (*Baker*; Pomona coll. 211, 210). The male is new.

♀ Antennæ entirely dark, flagellum with only the faintest red tint beneath toward the apex.

♂ Flagellum ferruginous beneath, except first and last joint; mesothorax polished, with well-separated punctures; first ventral segment of abdomen green with piceous margin, the others without metallic color; the second to fifth with straight hind margins, not emarginate, the sixth emarginate.

*Osmia cyanopoda* sp. n.

♀ Length nearly 10 mm., robust, deep indigo blue, the abdomen brilliant and shining; pubescence black, mixed with white on scutellum, and very slightly at sides of metathorax; antennæ black; femora and tibiæ strongly bluish or purplish; tegulæ with the anterior half blue; wings brown, paler along the veins; clypeus ordinary; mandibles tridentate; facial quadrangle longer than broad; mesothorax strongly and densely punctured; area of metathorax dull.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 182). In the table in Ent. News, June, 1910, this runs to *O. gabrielis*, from which it is known by being smaller, face narrower, punctures of mesothorax distinctly larger and less crowded, scutellum with partly pale hair, and bluish tibiæ. The rich blue-purple color of the abdomen is exactly the same in both. Pomona coll. 181 (Mountains near Claremont, *Baker*) is *O. pogonigera* Ckll.

*Osmia cyanosoma* sp. n.

♀ Length nearly 7 mm.; deep indigo blue, the middle of the abdomen stained with greenish; hair black, mixed with fine short pale hairs on mesothorax; tuft behind wings, and hair at sides of metathorax and sides of first abdominal segment white; mandibles with two large sharp teeth and two minute ones. Very close to *O. tristella* Ckll., but separated by the partly pale hair on mesothorax, the distinctly metallic femora and tibiæ, tegulæ bright blue in front, hair of tarsi brownish, first r. n. joining second s. m. more remote from base. Also resembles *O. hypoleuca* Ckll. but is separated by the shorter second s. m., abundant black hair on scutellum, and black hair on tubercles. In *O. hypoleuca* there is a patch of glistening pale hair on lower part of pleura, and in *O. cyanosoma* there is

a similar patch, though less conspicuous. Another related but distinct species is *O. sanctæ-rosæ*.

*Habitat*: Mountains near Claremont, California (*Baker*; Pomona coll. 182, part). This may be a southern subspecies of *O. tristella*.

A totally different *Osmia* from Claremont (*Baker*), marked 182, is *O. novomexicana* Ckll., with the hair of the thorax above less brightly colored than in New Mexico specimens, but otherwise identical.

*Osmia nigrobarbata* sp. n.

♀ Length a little over 10 mm.; robust; head, mesothorax and scutellum dark green; pleura and metathorax much bluer; abdomen shining greenish-blue; legs black, without metallic tints; head broad; eyes pea-green; mandibles tridentate, the teeth very large; clypeus black (except borders), with dense coarse black hair, contrasting with pure white hair on sides of face; front and vertex with hair mixed black and white; upper part of cheeks with white hair, lower with more or less black; flagellum short, very obscurely reddish beneath; mesothorax and scutellum with extremely dense small punctures; area of metathorax shining except basally; mesothorax with thin white hair, with some black intermixed; tubercles with pale hair, but pleura with black; scutellum with abundant creamy hair, a few black intermixed; metathorax with black hair on lower part of sides, otherwise with pale; legs with black hair, more or less brownish on tarsi, a small tuft of pure white on posterior knees; tegulæ black, green in front; wings brownish, especially the broad apical margin; first r. n. joining second s. m. at a distance from its base equal to length of first t. c.; abdomen with white hair on first segment, scanty black hair beyond, but grayish-white on sixth and apical margin of fifth; scopa black.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 182, part). Easily known by the contrasting black and white hair on face. It resembles *O. senior* Ckll., but differs by the shining area of metathorax, tridentate mandibles with large teeth, etc.

*Osmia melanopleura* sp. n.

♀ Length about 7.5 mm.; dark blue-green, densely punctured but somewhat shining; facial quadrangle longer than broad; mandi-

bles tridentate, the teeth large; clypeus extremely densely punctured; head with mixed white and black hair, the white conspicuous at sides of face, the black especially abundant on lower half of clypeus; antennæ black; thorax above with creamy-white hair, with black sparsely intermixed; metathorax with light and dark hair mixed; pleura with black hair (no patch of light hair below); legs black, with mainly black hair; tegulæ black, with a green spot in front; wings dilute brownish; b. n. meeting t. m.; first r. n. joining second s. m. as far from base as length of first t. c.; abdomen shining, the first two segments with glistening white hair, the next three with very thin light and dark hair, the sixth appearing greenish (contrasting with the rich purple-blue of the fifth), and hoary with appressed white hair; scopa black.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 182, part). Resembles *O. pikei* Ckll., but differs by the much more finely punctured clypeus, the much shorter vertex, the much more closely punctured abdomen, etc.

The following key separates the above mentioned species of *Osmia*; all females with black ventral scopa.

- |    |  |                            |
|----|--|----------------------------|
|    | Hair of thorax above wholly or mainly black..... | 1                          |
|    | Hair of thorax above wholly or mainly light..... | 3                          |
| 1. | Very small, not quite 7 mm. long.....            | <i>cyanosoma</i> sp. n.    |
|    | Larger .....                                     | 2                          |
| 2. | Tibiæ dark blue.....                             | <i>cyanopoda</i> sp. n.    |
|    | Tibiæ black .....                                | <i>pogonigera</i> Ckll.    |
| 3. | Small, about 7.5 mm. long.....                   | <i>melanopleura</i> sp. n. |
|    | Larger .....                                     | 4                          |
| 4. | Hair of thorax above all pale ochreous.....      | <i>novomexicana</i> Ckll.  |
|    | Hair of thorax above with some dark intermixed   |                            |
|    |  | <i>nigrobarbata</i> sp. n. |

*Nomada crotchii nigrior* Ckll.

This was described from the female. The male (*Claremont, Baker*) has no red on the thorax, but there are four small creamy-white spots, two at the anterior corners of scutellum, and two on postscutellum. Clypeus all cream-colored except upper edge; third antennal joint little over half length of fourth; legs with more

black; abdomen with sublateral dark spots; apical plate minutely notched.

*Nomada pyrrha* sp. n.

♀ Length about 8 mm.; bright ferruginous red, without yellow markings, and practically without dark ones; mandibles simple; head very broad; third antennal joint a little longer than fourth; black between ocelli; mesothorax densely roughened, with three faintly indicated bands of darker red; post scutellum not yellow; metathorax with a dusky shade in middle below the enclosure; face, scape and front with scattered long fuscous hairs; thorax above practically hairless; sides of metathorax with a patch of white hair; a black patch near bases of middle and hind legs; tegulae bright red, punctured; wings dilute brown, darker at apex; stigma ferruginous, nervures fuscous; b. n. going a considerable distance basad of t. m.; third s. m. much narrowed above; hind tibiae roughened on outer side, but not distinctly tuberculate; abdomen dullish, minutely granular; sides apically with fuscous hair; fifth segment with a narrow band of shining white tomentum.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 169). Closely resembles *N. californiae* Ckll., but is evidently an entirely red *Xanthidium*, to be associated with *N. miniata* Sm., which however, has the third antennal joint much shorter than the fourth, and orange spots on the abdomen.

*Nomada melanosoma* sp. n.

♂ Length a little over 5 mm.; black, the body almost without light markings; hind margins of abdominal segments (fully half of second and third) obscurely brown; extreme sides of segments 2 to 5 with very oblique broad white stripes; mandibles simple, white at base; lower edge of clypeus very narrowly reddish, with a white mark on each side; malar space white; head broad; face covered with silvery-white hair; antennae long, the flagellum thick, the joints swollen, obscure dark reddish beneath; third antennal joint about half length of fourth; vertex, cheeks and thorax (especially pleura and metathorax) with white hair; mesothorax dull, extremely densely rugoso-punctate; anterior legs in front, middle tarsi and apical part of femora in front, and apex of hind femora

in front, brownish-ferruginous; anterior femora with a whitish spot just before apex; tegulae very dark reddish-brown; wings long, stigma (which is large), and nervures piceous; apex of wings strongly dusky; b. n. falling short of t. m.; abdomen dull, only the extreme margins of the segments glistening; shape of abdomen rather long-oval, wide in middle; apical plate deeply notched; venter, except at base, marked with white.

*Habitat:* Mountains near Claremont, California (*Baker*; Pomona coll. 171). A distinct little species, easily known by its color. It falls close to *N. obscurella* Fowler, but that is larger (7.5 mm.), with legs largely yellow, including the middle and hind basitarsi, which are entirely black in *melanosoma*.

*Nomada subvicinalis* Cockerell.

Two males from Claremont (*Baker*) differ a little from the type. One has small yellow spots at anterior corners of scutellum, lateral margins of mesothorax very narrowly reddish, lateral face-marks continued as slender lines part way up sides of front, and apical plate of abdomen quite broad. The other lacks the yellow patch on second ventral segment.

*Nomada civilis* Cresson.

Two males from Claremont (*Baker*) are peculiar for having the apical plate of abdomen entire. One is about 9 mm. long, and has large yellow spots on the metathorax. The other is about 7 mm. long, and has the metathorax all black. *N. civilis* is one of the most variable of bees, but it appears difficult to satisfactorily define subspecies. *N. edwardsii* Cress. is another yellow and black species found by Baker at Claremont.

*Nomada erythrospila* sp. n.

♂ Length about 7 mm.; long and slender; head and thorax black, with white hair, abundant on face, pleura and sides of metathorax; head transversely oval; front, mesothorax and scutellum dull and rugose; mandibles simple, pellucid white at base, fulvous in middle, and dark at apex; labrum creamy-white, covered with white hair; lower margin of clypeus and lower corners of face (with a linear extension upward along orbits) cream-color; an-

tennæ very long, third joint about half length of fourth; scape black; flagellum fulvous beneath, suffusedly blackened above; tubercles yellow, two minute yellow dots at anterior corners of scutellum, and two yellow spots on postscutellum, all these markings inconspicuous; legs black and ferruginous, some of the markings characteristic; the anterior tibiæ red with a black stripe on outer side, at the end of which is a cream-colored spot; the middle femora red in front, with a large black basal patch; the middle tibiæ red with a broad black band on outer side, and an apical cream-colored spot in front; the hind knees creamy-white; tegulæ ferruginous; wings reaching about to end of fourth abdominal segment, dilute brownish with a large clear patch in the subapical field; stigma dark, dusky red; b. n. going a little basad of t. m.; abdomen long and narrow, dull ferruginous, the segments with broad dark basal bands; segments 1 to 4 with large (largest on second) lateral creamy-white patches, the first two short and broad, the other two transversely elongate, each having upon it a clear red spot; fifth segment with the pale patches almost joined in middle, sixth with a broad pale band covering nearly all the surface; apical plate deeply notched; venter ferruginous with whitish and dusky markings.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 172). A distinct little species of *Nomada* s. str. The abdominal markings suggest *N. crotchii* Cress., the male of which is not known, but the male of *N. crotchii nigrior* differs from *erythrospila* so much in form and face-markings, that we can hardly refer the latter to *crotchii*. In *N. crotchii* the first r. n. joins the second s. m. far beyond the middle, but in *erythrospila* it joins it at the middle. *N. marginella* Ckll., is allied to *N. erythrospila*, but the antennæ are quite different.

*Nomada odontocera* sp. n.

♂ Length a little over 7 mm.; rather robust, head and thorax black, densely rugosopunctate, but the large punctures of the mesothorax glistening; hair of head and thorax above pale fox-red, beneath dull white; head transversely oval; mandibles simple, yellow, red at apex; labrum yellow, not dentate; clypeus (except narrow upper margin) and lateral marks yellow, the latter extending

upward as rather narrow bands to about level of antennæ; scape stout, entirely yellow in front; third antennal joint much shorter than fourth, but more than half its length; flagellum thick, bright ferruginous beneath, black above, the joints conspicuously denticulate; tubercles yellow, but thorax otherwise all black; anterior coxæ unarmed; legs mainly red, but anterior and middle femora yellow in front, anterior femora black beneath, middle femora black behind except at apex; hind femora black, with the knees red, and a yellow spot at apex in front; hind tibiæ suffusedly blackish behind; tegulæ light ferruginous; wings ample, dusky at apex, stigma clear red; b. n. going a little basad of t. m.; first r. n. joining second s. m. well beyond middle; abdomen bright ferruginous marked with black and bright yellow; first segment black with a broad red band on which are two obscure dusky spots; all the segments with fuscous hind margins, second and third segments intense black at base; second to fifth segments laterally with yellow spots, very large on second, successively smaller on the others; sixth segment red; apical plate strongly notched; venter with two yellow spots on second segment.

*Habitat:* Mountains near Claremont, California (Baker; Pomona coll. 168). Allied to *N. undulaticornis* Ckll., but easily distinguished by the scutellum, which is not prominent or bigibbous, and by many details of the coloration. Also related to *N. denticulata* Rob.

*N. elegantula* Ckll. was also taken by Baker at Claremont.

*Exomalopsis velutinus* sp. n.

♀ Length about 9 mm.; black, with a rather long, not subglobose, abdomen; head broad, facial quadrangle broader than long; eyes gray; blade of maxilla broad to end, the inner half (longitudinally) pallid; labrum densely covered with pale ochreous hair; clypeus densely rugosopunctate, the lower margin dark red; face and front with long dull white hair; vertex smooth and polished; flagellum bright chestnut red beneath, except at base; thorax with pale ochreous-tinted hair; mesothorax polished, shining, with scattered punctures, only hairy at front and sides, and narrowly on hind margin; scutellum with similar sculpture and hairy border, but more closely punctured, and some short black hairs bordering

the disc; base of metathorax roughened but glistening; legs densely hairy, the hair pale ochreous-tinted; hind tibiae and basitarsi with a very broad loose scopa, hair on inner side of hind basitarsi pale ferruginous; tegulae piceous; wings rather short, faintly grayish, with a milky appearance in certain lights; greater part of abdomen densely covered with felt-like very pale ochreous pubescence, but apex with pale ferruginous; base of second segment with the hair so thin as to leave a dark band; first segment bare in middle, finely punctured; hind margin of first segment (tegument) broadly reddened, and the second and third the same, only in these the color is hidden by the pubescence; venter with bands of red-golden hair alternating with pale.

*Habitat*: Claremont, California (*Baker*; Pomona coll. 153). Very like *Melissodes stearnsi* Ckll., which is to be called *Exomalopsis stearnsi*, but readily distinguished by the shorter and relatively broader marginal cell, the well though finely punctured disc of first abdominal segment, and the much shorter third antennal joint (length 480 microns in *stearnsi*, 350 microns in *velutinus*). The apical plate of abdomen is much broader than in *stearnsi*, with straight sides. Both species look like some *Xenoglossodes*, from which the most conspicuous superficial distinction is the bare polished disc of mesothorax. A second specimen of *E. velutinus* bears the number 147.

*Exomalopsis melanurus* sp. n.

♀ Length about 8 mm.; black, abdomen oblong; light hair ochreous-tinted dorsally, dull white below; head broad; eyes pale grayish-green; mandibles red in middle; clypeus densely and strongly punctured; face and front with grayish-white hair; vertex shining; flagellum dusky ferruginous beneath except at base; mesothorax and scutellum with sculpture and arrangement of hair as in *E. velutinus*; legs with long pale hair, the copious scopa of hind legs wholly pale; a black brush at end of hind basitarsi; tegulae piceous, wings faintly dusky; first abdominal segment with long pale hair, the broad hind margin bare except at sides, where there is a dense patch of hair, extreme margin (tegument) pallid; segments 2 to 4 with very broad dense felt-like ochreous hair-bands, the basal part of the segments exposed and appearing black; fifth segment and

apex densely covered with brownish-black hair, but there is a tuft of light hair on each side beneath.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 148). This looks like *Anthophorula bruneri* Crawf., but is at once separated by the roughened disc of first abdominal segment, the black hair at end of abdomen, and the minute dark stigma; there is evidently no real affinity.

*Melissodes pygmæa* Cresson, from the description, is apparently an *Anthophorula* or *Exomalopsis*; indeed the description might well apply to *A. bruneri*.

*E. velutinus* and *E. melanurus* are not typical *Exomalopsis*. The genus as at present understood contains some rather diverse elements.

*Bombomelecta maculata* (Viereck)

Viereck described this as a variety of *B. separata*, but it seems to be a distinct species. A female from Claremont (*Baker*; Pomona coll. 162), has the spots on third and fourth segments quite large and quadrate, and there are small spots on the fifth.

*Coelioxys megatricha* sp. n.

♂ Length about 11 mm.; black, with bright ferruginous legs (the femora dusky beneath) and rather dark red tegulæ; no red on abdomen, above or below; mandibles dark red subapically; face and front densely covered with long white hair; antennæ black, third joint distinctly longer than fourth; vertex with very large punctures, which laterad of the ocelli are distinctly separated, leaving interspaces equal to the size of punctures; eyes pea-green, with very long hair; mesothorax and scutellum densely and very strongly punctured, middle of mesothorax with little longitudinal ridges; scutellum rounded behind, teeth at sides long, finger-like, slightly incurved; pleura and metathorax covered with long shaggy white hair; anterior coxæ with strong spines; anterior trochanters and femora with much white hair beneath; spurs red; wings clear, the apical margin broadly dusky; abdomen with white hair-bands at apices of segments; dorsum and sides of first segment closely punctured; second and third segments with very deep transverse impressions, and strongly punctured, the ridge just behind the impression with sparse punctures;

fourth and fifth segments with large triangular elevated areas, which are rather sparsely punctured; fifth segment with a small tooth on each side; sixth with dense white hair at base, at each side a long sharp tooth, the apical lobes far apart, each with two teeth, the upper short, little more than a salient angle, the lower long, flattened, rounded at end, divergent; fourth ventral segment not emarginate.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 195). I wondered whether this could be the undescribed male of *C. coquilleti* Crawf., but it is larger than the male of that species would probably be, there are no hair bands bounding mesothorax or scutellum posteriorly, the vertex is not entirely rugose, and the abdomen is without red. From *C. novomexicana* it is easily known by the hair on eyes being more than twice as long. By the long hair on the eyes it resembles *C. ribis kincaidii* Ckll., which has black legs, and the apical teeth of abdomen closer together and almost parallel.

*Coelioxys angulifera* sp. n.

♀ Length about 11.5 mm.; black, strongly punctured, with white hair; lower margin of clypeus angularly produced and sloping a little outward; knees, tibiae and tarsi dark red, the tibiae with a strong blackish suffusion. Very close to *C. banksi* Crawf. (from Virginia), differing thus: teeth at sides of scutellum long; no band of white hair in scutello-mesothoracic suture; mesopleurae with long hair (not very dense) all over; last ventral segment not so much extended beyond last dorsal. Except for the clypeus, it much resembles *C. moesta* Cress., differing in the much longer teeth at sides of scutellum, and much larger punctures at base of penultimate ventral segment.

♂ Length about 8 mm.; face and front densely covered with white hair; anterior coxae with well-developed spines; legs darker, the tibiae mainly blackish; fifth abdominal segment with a short spine on each side; sixth with a long spine on each side, and the apical lobes each with two spines, the upper much shorter than the lower; no median spine; fourth ventral segment entire. In my table of male *Coelioxys* (*Canad. Entom.*, 1912, p. 170) this runs to *C. angelica* Ckll., the female of which is very different from *C. angulifera*.

*Habitat:* Claremont, California (*Baker*; Pomona coll. 195). The female is the type. Were the insects not separated by the whole breadth of the continent, I should suppose this a race of *C. banksi*. *C. novomexicana* (Ckll.) was also taken by Baker at Claremont.

*Xenoglossa angelica* Ckll.

Claremont (*Baker*; Pomona coll. 145.)

*Tetralonia robertsoni* Ckll.

A female from Claremont (*Baker*; Pomona coll. 153) agrees with one from Garrison, N. Y. Can there be any error in the locality label?

*Ceratina neomexicana punctigena* subsp. n.

♀ Length about 8 mm.; differs from typical *neomexicana* by the cheeks, which are strongly and quite closely punctured, except a narrow band along orbits. The wings are strongly reddened, and the mesothorax is sparsely punctured anteriorly. It is known from the superficially similar *C. tejonensis* Cress. (which Baker obtained at Claremont) by the green (rather than blue) color, the white tubercles, and the strongly punctured cheeks.

*Habitat:* Mountains near Claremont (*Baker*; Pomona coll. 174). Baker also took *C. acantha* Prov. and *C. arizonensis* Ckll. at Claremont.

*Anthidium angelarum* Titus

Both sexes were taken by Baker at Claremont, Calif. The male, not described by Titus, runs to *A. palliventre* in my table in Bull. So. Calif. Acad. Sci., 1904, p. 57. It differs from the insect there referred to *palliventre* by the bright chrome yellow markings and the distinct rounded excavation on each side of median spine at apex of abdomen. The clypeus and large cuneiform lateral marks are entirely yellow. The female has yellow stripes on tibiae, not mentioned by Titus.

*A. illustre* Cress. and *A. tricuspidum* Prov. were also taken by Baker at Claremont.

*Dianthidium provancheri* Titus

This is the species which I recorded as *D. consimile* (Ashm.) in Bull. So. Cal. Ac. Sci., 1904, p. 5. A specimen of true *consimile*

was collected by Baker in the mountains near Claremont. The males may be separated thus:

Outer face of hind tibiae with a large black mark; yellow band of scutellum broadly interrupted in middle; median tooth at apex of abdomen black at end.....*provancheri* Titus.

Outer face of hind tibiae entirely yellow; yellow margin of scutellum not interrupted; median tooth at apex of abdomen long and entirely yellow.....*consimile* (Ashm.)

A male with pale markings, collected by Grinnell in the San Gabriel Mts., has the hind tibiae as in *provancheri*, but the light band on scutellum, though narrow, is entire, and the median tooth at end of abdomen is rather brown than black at end. This is referred to *provancheri*, but it may be that the two names represent extremes in the variation of a single species.

*Triepeolus ancoratus* sp. n.

♀ Length about 8 mm., with ochreous markings and red tegulae and legs. Very near to *T. callopus* Ckll., but smaller; mesothorax with two broad bands and margin with ochreous pubescence, leaving only an anchor-shaped black area; cheeks and front densely covered with pubescence; antennae red, dusky above, especially the hind margins of joints; pleura with no bare patch. The mandibles, labrum, lower margin of clypeus and apex of abdomen are red, as in *T. callopus*. The black transverse band on first abdominal segment is completely isolated by dense ochreous pubescence; the black on second segment forms a very acute angle at sides. The last ventral segment is turned down at end.

*Habitat*: Claremont, Calif. (Pomona coll. 155). Certainly very near to *T. callopus*, but quite distinct by the characters indicated. Collected by Baker.

*Triepeolus callopus* Ckll.

One of each sex comes from Claremont (*Baker*; Pomona coll. 157, 158). The male is new. I give new descriptions, based on these specimens.

♀ Length about 7.5 mm.; black, with clear red legs (but spurs of middle and hind legs black); clypeus, labrum, mandibles (except apex), tubercles, tegulae (except hyaline margin) and apex of abdo-

men also red; light markings dorsally pale creamy, ventrally white; head broad; clypeus minutely granular; antennæ red strongly suffused with blackish, apex of scape and base of flagellum brighter red; third joint shorter than fourth; front and vertex more or less striate; mesothorax very densely and minutely punctured, with two parallel bands of pale ochreous hair, a spot of hair at each posterior corner, and a band in scutello-mesothoracic suture; pleura with a large bare densely punctured patch; scutellum rather strongly bilobed; axillar teeth very short; wings somewhat dusky, brownish; abdomen with broad, continuous light ochreous bands on segments 1 to 4, that on first notched in middle anteriorly; black area on first segment a broad transverse band; light band on second segment with a large oblique lobe (directed mesad) laterally, giving the outline of a scythe; modified apical patch rounded; last ventral segment curved downward at end.

♂ Clypeus all black; scape black; flagellum dusky reddish, without any bright red; face with dense white hair; tubercles black; pleura with a bare patch just below wings, but the lower bare patch small and indistinct; femora black, with red knees; hind margins of second and following abdominal segments brownish; apical plate extremely narrow.