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NOTES ON

The Diptera of Baja California,

INCLUDING SOME SPECIES FROM ADJACENT REGIONS.

BY

C. H. TYLER TOWNSEND.

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ON THE DIPTERA OF BAJA CALIFORNIA, INCLUDING SOME SPECIES FROM ADJACENT REGIONS.

BY C. H. TYLER TOWNSEND.

The material described and identified in the following pages, which is mostly from the very interesting region of Lower California, was sent to me for study by the California Academy of Sciences. Type specimens of all the new species herein described are contained in the collection of the Academy. Most of the material was collected by Dr. Gustav Eisen, the remainder having been secured by Mr. Chas. D. Haines and others.

Some very interesting forms were found in the Lower California material, of which perhaps the most important are four species of Rhapsomidas, while the whole is of much interest as coming from a region which is hardly known as yet dipterologically.

SIMULIDÆ.

1. *SIMULIUM CINEREUM* Bellardi. El Taste, Cape Region, Baja California (Eisen). September. Seven females. These agree well with description, and are undoubtedly this species. The antennæ are rather brownish than black, however; and the thorax is often more or less rufous on dorsum.

BIBIONIDÆ.

2. *DILOPHUS STYGIUS* Say. Compl. Wr. ii, 352. San José del Cabo, Baja California (Eisen). October. Thirteen females. El Taste, Baja California (Eisen). September. Eight females and six males. The females agree with Say's description, and I believe should be referred to this species. The males are smaller, with much smaller wings in proportion, and the wings are whitish except the small black stigma. The female is

entirely black, wings and all. The males have the same thoracic and front tibial spines as the females.

PSYCHODIDÆ.

3. *PSYCHODA* sp. Marin county, Cal. (Haines). A single specimen in too poor condition for determination.

STRATIOMYIDÆ.

4. *HERMETIA AURATA* Bellardi. San José del Cabo, Baja California (Eisen). September. Thirty-four specimens. These I refer all to this species. They are very uniform in size. All but one are about 11 mm. long, and that one is 9 mm. The abdomen is of a yellowish-brown color, with first segment blackish, and other segments clothed with the short golden pubescence except a bare spot on lateral edge of each.

5. *HERMETIA EISENI* n. sp.

Three specimens, measuring 9 to 14 mm., have the abdomen blacker, and the golden pubescence absent from anterior half of fourth segment and anterior two-thirds or more of second and third segments, these areas being dark brown and uniting the lateral spots of the segments. The golden pubescence extends anteriorly in an angular projection on each side of these three segments. They also differ in having less yellow on the wings, this color being an arc-like marking extending narrowly along anterior edge of anal cell and across discal to marginal cells. The portion of the wing anterior to this arc is blackish like rest of wing, but in *H. aurata* this portion is all yellow like the arc. The thorax is somewhat darker and less golden pubescent, but in other respects, including coloration of legs and antennæ, the species agrees with *H. aurata*. The golden pubescence of thorax is confined to a median line considerably or greatly abbreviated behind, and to a marginal band on hind border. The spec-

imen referred by O. S. to *H. aurata* in the Biol. C.-A., Dipt., seems to come close to this form. The large specimen (14 mm.) is from San José del Cabo, and the others are from El Taste.

ACANTHOMERIDÆ.

6. *ACANTHOMERA CHAMPIONI* Osten Sacken, Biol. C.-A., Dipt. i, pp. 67-8. Costa Rica (W. Gierisch). One female. Length, 45 mm. to end of 7th segment. The two broader velvety black vittæ of thoracic dorsum are continued on the sides of scutellum and meet on the hind border, thus forming a velvety black margin to the scutellum. The latter is not yellowish pruinose at base. First abdominal segment is velvety black on front border, as well as behind. The fifth segment is fully one-third the width of fourth. The first and second antennal joints are shining, but the third is opaque with more of a dull grayish cast. The facial tubercle is moderately prominent. In all other particulars agreeing with Osten Sacken's description, except that the shining spot of middle of thoracic dorsum is nearer the scutellum (where the pin enters), and is perhaps produced by the entrance of the pin.

The lateral edges of third and fourth segments are sharp and ciliate. There are apparently no hind femoral spines, but the face has a very distinct rounded-conical tubercle just below base of antennæ. Palpi are normal, sublinear.

TABANIDÆ.

7. *SILVIUS GIGANTULUS* Loew. Lake Tahoe, Sierra Nevada, Cal. (C. Troyer). Two females. They measure $8\frac{1}{2}$, and nearly 9 mm. The abdomen in both is of an even deep yellow hue, with a faint tinge of orange. The basal segment of the abdomen has the transverse double cinereous marking, but there are no traces of cin-

ereous on the second segment. No dark spot on venter. Facial, frontal and ocellar callosities perfect.

8. *APATOLESTES COMASTES* Will. El Paraiso, Baja California (Haines). May. Five females. Rancho Viejo, B. C., April, one ♀. I refer these somewhat doubtfully to this species. Their length is 10 mm. They agree quite well with Williston's description. The tibiæ are rather brownish which may be due to bad preservation, and the cross-veins are hardly clouded.

9. *APATOLESTES* (or nov. gen.) *EISENI* n. sp.

San José del Cabo (Eisen). One ♂. Length, 7½ mm. Wholly blackish. Thorax with a slight whitish bloom. Scutellum and abdomen shining blackish brown. Legs black. Wings quite evenly and very decidedly smoky, a little lighter in the neighborhood of anal angle. Eyes contiguous for a long distance, flattened anteriorly, face short. Antennæ rather slender, not long, brownish, first joint short, second still shorter; third not like *Apatolestes*, but composed of only five annuli, the basal one swollen and rather bead-like, as thick as first and second antennal joints, while the remaining annuli are slender. Proboscis and palpi blackish. Hind tibiæ with spurs. Ocelli present.

This can hardly be the ♂ of *Apatolestes comastes* Will., and I believe will prove to be a new genus. It is entirely different from *Chrysops* in its antennal structure, and can hardly be either a *Silvius* or an *Apatolestes*. I hesitate to describe the genus, however, from the male alone. In antennal characters it seems to approach the genus *Goniops* Aldrich.

10. *CHRYSOPS PACHYCERA* Will. El Taste, Baja California (Eisen). September. One ♀ and two males. These agree with Williston's description in the color of

the antennæ, those of the male being slightly darker, but the first two joints of ♂ antennæ are no shorter than those of female. I therefore believe that the ♂ specimen described by Williston under this name belongs to another species. Williston does not mention the color of the scutellum, which is black. The males have thorax blacker, and more black on median portions of first two abdominal segments.

11. *THERIOPLECTES COMASTES* Will. Rancho Viejo, Baja California (Haines). April. Three females. Baja Purisima, B. C., April. One ♀. I refer these to this species rather than to *T. phænops* O. S., because they have the antennæ largely reddish. There is no trace of cloud on the furcation of third vein. Two specimens have the red of sides of abdomen much more extensive than have the others. The first two antennal joints and base of third are reddish. Length, about 15 mm.

12. *THERIOPLECTES PHÆNOPS* O. Sack. California (probably near San Francisco). Six females and one male. Antennæ wholly black. In the male the median black stripe on abdomen is not so jagged but more even on the edge, and the rufous does not extend on the fourth segment. One of the females agrees with it in this respect. Wings with a hardly perceptible trace of a brown cloud on furcation of third vein. Length, 13-14 mm. One of the females shows a peculiar deformity of the abdominal segments.

13. *TABANUS ÆGROTUS* O. S. Sierra county, Cal. One female, length, 21 mm., I refer to this species.

14. *TABANUS LINEOLA* Fab. California (probably near San Francisco). One female.

El Taste, B. C. (Eisen). Two ♀. September. Length, 11½ to 14 mm.

15. *TABANUS PUNCTIFER* O. Sack. San José del Cabo, Baja California (Eisen). Two females. Length, about 18 mm. The front, thorax and scutellum are denuded in both, and in one the frontal callosity is in consequence not distinguishable, being concolorous with rest of front. The denuded thorax and scutellum are of a brownish red.

El Taste, Baja California (Eisen). September. Four females and one male. San Ignacio, B. C., April, two females (Haines). San José del Cabo (Eisen), September, one male.

ASILIDÆ.

16. *STICHOPOGON TRIFASCIATUS* Say. San José del Cabo, Baja California (Eisen). Four specimens. The second, third, fifth and sixth abdominal segments are velvety opaque black, except the narrow laterally widening front borders which are covered with the silvery bloom of the rest of the abdomen.

17. *PROMACHUS* n. sp.?

San José del Cabo, Lower California (G. Eisen). One female. It seems to most nearly approach *P. magnus* Bellardi. But there are no distinct vittæ or spots on the pollinose thorax, the wings are hyaline, and there is no fuliginous in the first submarginal cell. Length, including the short ovipositor, 32 mm.; of wing, 24 mm.

18. *ERAX CARINATUS* Bellardi? Hermosillo (Sonora), Mexico (Eisen). One female. I refer this specimen doubtfully to this species, on the strength of Osten Sacken's note on two similar females from Presidio, Mexico (Biol. Centr.-Am. Dipt. i, 205). In the present specimen, however, the hairs on the scutellum are quite whitish, and the ovipositor is not so elongate. Only the male of *carinatus* was described by Bellardi, and Osten Sacken,

who has seen the type, is inclined to refer his females to that species.

19. *ERAX CINERASCENS* Bellardi. San José del Cabo, Baja California (Eisen). Twenty-seven females and one male. Osten Sacken warns us not to confound this species with the Mexican *E. tricolor* Bell., which has black hairs in its mystax. All of the above specimens have the mystax wholly whitish or yellowish. But the twenty-seven females were taken in company with the large number of males mentioned under *E. tricolor*, and all of which had black bristles in the mystax. Only one male was taken with a wholly whitish or yellowish mystax, which makes it seem very improbable that this and *tricolor* are distinct species, yet they may be so.

20. *ERAX TRICOLOR* Bellardi. San José del Cabo, Baja California. September. Twenty-two females and thirty-eight males. These specimens all agree in having black bristles in the yellowish-white mystax. Otherwise they do not differ at all from *E. cinerascens* Bell., and both forms occur extensively in company with each other.

21. *PROCTACANTHUS ARNO* n. sp.

San José del Cabo, Baja California (Eisen). Eleven females and ten males.

Length, ♀, 31-38 mm.; ♂, 25-32 mm. Antennæ and eyes blackish, front with black hairs, and some white at anterior angles; face yellow, cheeks dark, the whole with white beard extending on occiput. Thorax brownish ashy, with a median pair of distinct dark brown vittæ which are attenuated posteriorly. Humeri somewhat lighter, with a whitish pollinose area behind them along sides of thorax. Pleuræ and sternum grayish with grayish hair. Abdomen more or less grayish or ashy on



basal half and with grayish hair, chiefly on first to third segments, the dorsum of segments blackish. Second and third segments, especially in the female, more or less faintly reddish on sides, other segments more broadly and distinctly so, the black of dorsum of segments being well defined and widening posteriorly. The red is often indistinct and more or less absorbed in the male. Hypopygium a little elongate, ovipositor not large. Legs reddish, with a quite even black tinge on the outer surface. Macrochætæ black, pulvilli yellowish. Wings very faintly and evenly tinged with smoky.

22. *PROCTACANTHUS ZAMON* n. sp.

San José del Cabo, Baja California (Eisen). Twenty females and thirty-seven males.

♂ ♀. Length, 21 to 27 mm. A stout species with large thorax. Head blackish, front with black hair; face more yellowish, with long pale yellow beard, extending on the cheeks. First antennal joint black; second and third brown, subequal, shorter than first, style longer than antennæ. Thorax soft brownish black, with an indistinct pair of median vittæ, having a narrow reddish line between them anteriorly which may extend to scutellum. A reddish line extending inward on suture from root of wings, and a line outside median vittæ posteriorly. A whitish spot inside the humeri. Humeri, edges of thoracic dorsum, and the scutellum brown, the latter with bristly black hair, hind margins of thorax with black macrochætæ. First two abdominal segments blackish with blackish pile, the second usually with a yellow hind margin; rest of abdomen yellow, with yellow pile which is chiefly on third and fourth segments. Some yellow pile on hind margin of second segment in both sexes. Terminal segments with a deeper yellow tinge. Abdomen tapering in both sexes, more so in female, ovipositor rather

small and spinose, hypopygium small. Legs chestnut brown, with black hair and black macrochætæ, the hind tibiæ conspicuously yellowish with yellow hair, the hind tarsi pale brownish. Pulvilli broadly yellowish on borders. Wings subhyaline, very evenly tinged with smoky.

APIOCERIDÆ.

The collection contains no less than twenty specimens of *Rhaphiomidas*! Baja California seems to be the home of this remarkable genus, especially the Cape Region of the peninsula. Four species are represented in the material, of which I describe two as new. In a third I recognize *episcopus* of Osten Sacken (but not of Coquillett). The fourth is *acton* Coqll. The following table will serve to separate these four species:

Table of Species of Rhaphiomidas.

- | | |
|--|-------------------------------------|
| 1. Abdomen wholly black; wings with a smoky tinge, antennæ blackish. | |
| | <i>episcopus</i> O. S. (non Coqll.) |
| Abdomen not entirely black; wings hyaline, antennæ yellowish or reddish at least on third joint. | 2 |
| 2. Abdomen almost wholly yellow. | <i>xanthos</i> n. sp. |
| None of the abdominal segments entirely yellow, the second to fourth each partly yellow and partly blackish. | 3 |
| 3. Ground color of abdomen yellowish, only the front border and a median spot on second to fourth segments blackish; bristles of legs and scutellum yellowish. | <i>acton</i> Coqll. |
| Ground color blackish, only the hind border of second to fourth segments yellowish; bristles of hind border of scutellum and of middle and hind legs blackish. | <i>mellifex</i> n. sp. |

These forms are of much interest in view of the long disputed question as to the systematic position of Apio-cera and the allied genera, and as to whether the group should be given family rank. I have examined none of the genera other than *Rhaphiomidas*, but I can give my opinion upon the latter. After an examination of this material and a study of Dr. Williston's able résumé and discussion of the subject, including his investigations of

the mouth parts (Kans. Univ. Quart. i, pp. 101-118), I am quite prepared to accept the family Apioceridæ. There seems an abundance of difference between this family and the Asilidæ on the one side and between it and the Mydaidæ on the other. These differences are certainly more in favor of the Asilidæ than of the Mydaidæ, though they are too great to admit of uniting them in the same family.

The small cross-vein on the posterior margin of the wing (between the anal cell and the tip of wing) is distinct and well developed throughout in all my specimens of *xanthos*, *mellifex* and *acton*; but it is atrophied terminally in both specimens of *episcopus* (see description of that species). It should also be noted that the apical style of third antennal joint is minute in all the species, almost microscopical.

23. RHAPHIOMIDAS ACTON Coquillett. Sonora, Mexico (Eisen). One male. It agrees in every particular with Mr. Coquillett's description (W. Am. Sci. vii, pp. 85-6), except that the hypopygium is more than one-half as long as abdomen. (Abdomen measures 9 mm.; hypopygium, nearly 6 mm.) Length (hypopygium deflected upward), 23 mm.; of wing, 18 mm.; expanse, about 42 mm.

The ocelli show very plainly, not as convex and shining, but as excavated and yellowish pollinose, leaving only a circular shining blackish rim.

Coquillett does not give a full description of *acton*, but compares it with *R. mellifex*, which he identified as *episcopus*. The present specimen has, in addition to the black of the abdomen mentioned by Coquillett, four black lateral spots on segments 2, 3, 4 and 5. They are rather triangular in shape, and decrease markedly in size posteriorly, the first being large and the fourth minute and

hardly apparent. Each occupies the lateral anterior angle of the dorsal sclerite of the segment. Hypopygium is entirely blackish. Palpi brownish, clothed with yellowish-white bristles. Venter yellowish. All the femora blackish, but yellowish at tips, the hind pair more narrowly so; tibiæ and tarsi wholly whitish yellow.

The bristles of hind border of scutellum are clear yellowish. Hypopygium is clothed with short yellowish pile. Antennæ are blackish or brown, third joint reddish. In both *mellifex* and *acton*, as well as *xanthos*, the macrochætæ of antennæ are yellow, while in *episcopus* they are blackish.

24. RHAPHIOMIDAS EPISCOPUS Osten Sacken (non Coquillett). Baja California, September (Eisen). Two specimens, ♂ ♀, San José del Cabo.

Length, 20–21 mm., excluding antennæ. After studying Osten Sacken's description and Coquillett's notes, with the material before me, I have no hesitation in saying that Coquillett did not possess *R. episcopus* O. S., but that the species which he so identified is a new species which I describe below as *R. mellifex*. *R. episcopus* has no yellow whatever on the abdomen in either sex. Coquillett's statements that the ♂ of *R. episcopus* has the last three abdominal segments destitute of black pile, and that in both sexes each abdominal segment is bordered posteriorly with yellowish, show that he had *R. mellifex* under observation.

The male of *R. episcopus* has yellowish pile on the first abdominal segment only (also on the thorax, occiput, front, face, and front coxæ); the rest of the abdominal segments, especially the last three even including the hypopygium at base, having black pile. The female has segments one to four bordered with yellowish pile, less conspicuous in the middle of fourth. Antennæ in both

sexes are blackish, third joint slightly reddish. Thorax blackish in ground color, grayish pollinose, showing a median approximated pair of dark vittæ abbreviated posteriorly. The middle and hind coxæ, especially in the female, are also yellow pilose. The hypopygium is not nearly so large as in *R. acton*, about same size as in *R. xanthos*. The middle and hind legs of male are almost wholly blackish, the tarsi being brownish and the pulvilli yellowish; the middle tibiæ are also somewhat brownish. The front tibiæ and tarsi, however, are brownish yellow with pile of the same color. Macrochætæ of legs all black. The female has the middle tibiæ and tarsi more yellowish, and the front tibiæ and tarsi still more so, the latter with some of the macrochætæ yellowish. Macrochætæ of margin of thorax and scutellum blackish in both sexes. In the right wing of the male the small cross-vein of posterior margin is represented only by the merest stump, and is abbreviated and attenuated in the other wing and in both wings of the female. The ocelli are concave and pollinose. This species may be known by the smoky tinge of its wings, the wings in the other species being perfectly clear.

It should be noted that Osten Sacken says that his specimen may have come from Lower California.

25. RHAPHIOMIDAS MELLIFEX n. sp.

Syn. *R. episcopus* Coquillett (non Osten Sacken).

Baja California. September (Eisen). Six females, from San José del Cabo. This is apparently the species which Coquillett (West Am. Sci., Jan. 1891, p. 85) mentions as *R. episcopus*. The distinctions which he has drawn there between this species and *acton* are nullified by his later article in Can. Ent. (Dec. 1892, pp. 314-315). The ocelli are not convex and shining, but are collapsed and yellowish pollinose as they are in all the other species

of Rhapsiomidas. The bristles of posterior angles of thorax are, as a rule, yellowish, but sometimes somewhat blackish; those of hind border of scutellum, however, are blackish in all of my specimens. The ground color of whole body is blackish, thorax and scutellum gray pollinose, leaving a pair of closely approximated dark vittæ abbreviated behind. Abdominal segments two, three, and four are bordered on about posterior one-third with yellowish, the yellow widening laterally on second. First segment very narrowly yellowish on hind border, especially laterally. Legs colored as in *acton* (pale or yellowish, the femora except tips darker), macrochætæ of middle and hind legs blackish or brown, those of front legs yellow. (In *acton*, the macrochætæ of the legs are entirely yellow.) The last three segments of abdomen are more or less yellow in ground color, but appear blackish from being clothed with the short, appressed, anteriorly directed, black hairs. Pile of rest of abdomen whitish or yellowish. Wings clear. Antennæ yellowish, third joint more or less reddish, sometimes the basal joints brownish. Pile of thorax, occiput, face, front, coxæ, and sternum yellowish, that of latter more whitish. The middle and front tibiæ and tarsi are clearer and lighter yellowish than those of hind legs. Length, 21 to 26 mm.

Although my six specimens are all females, and my eleven specimens of *xanthos* are all males, and moreover both were largely collected at the same time and place, still I do not believe that I am describing two sexes of the same species. The sexes of Rhapsiomidas appear to closely agree in coloration. Coquillett assures us that the sexes of *acton* are alike in coloring. Besides, *xanthos* comes much nearer to *acton* in coloring than it does to *mellifex*, and we know that it can not be the male of *acton*. From *mellifex* it further differs in the macrochætæ of scutellum (and middle femora) being yellow.

26. RHAPHIOMIDAS XANTHOS n. sp.

San José del Cabo, Lower California (Eisen). One male. Length, 21 mm.; of wing, over 17 mm.

Differs from *R. acton* as follows: Abdomen entirely orange-yellow, only the base of first segment and the base and a median triangular cloud of second segment blackish. Hypopygium about one-fourth as long as abdomen. Macrochætæ of femora mostly black, especially of hind femora.

Differs from *R. episcopus* (besides in above characters) as follows: Bristles of posterior angles of thorax and scutellum yellow. Abdomen shorter than wings. Segments 5, 6 and 7 together not longer than third.

The hypopygium is concolorous with the abdomen, orange-yellow, with a hardly darker or reddish tinge.

The front is narrower than in the male of *acton*, especially at the vertex. In *acton* (♂) the front is but slightly widened anteriorly near antennæ. In *xanthos* (♂) the front widens quite evenly from vertex to base of antennæ, being fully twice as wide anteriorly as at vertex. Antennæ and legs entirely orange-yellow, with a reddish tinge basally. The venter is concolorous with the abdomen, entirely orange-yellow, and the sides of abdomen are without the lateral black markings (on second, third, and fourth segments) of *acton*. The eyes seem to be more of a purplish than of a greenish tinge. The coxæ and trochanters are of the brownish color of the pleural regions.

Palpi smaller than in *acton*, and apparently not so bristly, yellowish in color. Whole abdomen, venter and hypopygium especially, clothed with silken yellowish pile, rather long below but not especially thick, more so on the sides and extremity.

Since the above description was drawn up, there were

received, in a second lot of material from the Academy, ten additional specimens, all males, from San José del Cabo. They vary from 17 to 22 mm. in length. The whole body is yellowish pilose, and the macrochætæ are wholly yellow except those of hind legs black. The thorax is blackish in ground color, grayish pollinose, leaving a median pair of geminate dark vittæ abbreviated behind, and a widened tapering vitta on each side reaching scutellum. Sometimes there is a faint trace of black on median anterior portion of third abdominal segment. The hypopygium is uniformly short and much smaller than in *acton*.

This species seems to mimic, in general appearance, the large asilid with yellow abdomen described in this paper as *Proctacanthus zamon*, which is very common in the southern portions of Baja California. The resemblance is very striking.

ACROCERIDÆ.

27. PTERODONTIA VIX n. sp.

Southern California. One specimen. Length, 5 mm.; of wing, 5 mm.

I do not believe that this can be *Pt. misella* O. Sack. Williston states in his characterization of the family that the eyes are contiguous in both sexes. Yet (in Trans. Am. Ent. Soc.) he later states that he has specimens of *Pt. misella*, which Osten Sacken says is very like *Pt. flavipes*, differing only in size and the coloring of the abdomen. Now, Macquart figures and describes *Pt. flavipes* as having a very widened head with widely separated eyes, and the costal dilatation of the wing and its venation are very different from what is found in the present specimen. If Macquart's description of *Pt. flavipes* is correct, and he says he figures the type described

by Gray in Griffith's Animal Kingdom, then the present species is entirely different from *Pt. misella*.

It may be recognized by the following characters: Entirely black, except the irregular posterior half of abdomen, the venter, the front legs, and the tibiæ and tarsi of the middle and hind legs. The venter and the light portions of legs are yellowish, the front femora being dark basally. The posterior portions of abdomen are orange-yellow, being the sides of second segment, and all of third, fourth and fifth (anal) segments except a median black stripe on third, which is much widened anteriorly where it joins the black of anterior portions and less widened posteriorly, and a median black spot at base of fifth. In the red of sides of second segment there is a triangular black spot, whose edge is identical with posterior border of the segment.

The head is hemispherical, mostly taken up with the contiguous eyes, which are very pilose. The costal dilatation of wing is very pronounced and obtuse or swollen in outline, with the short but stout tooth on the outer posterior border of swelling. The tegulæ are smoky, with a blackish narrow border. Wings hyaline; wing-veins yellowish, brownish basally.

28. *EULONCHUS TRISTIS* Loew. California. One specimen. Abdomen more greenish than violaceous.

29. *ONCODES ÆDON* n. sp.

Baja Purisima, Lower California. April. One specimen. Length, slightly more than 4 mm.

Very similar to *Oncodes humeralis* O. Sack. (Biol. Centr.-Am., Dipt., i, 164-5), but differs in the tegulæ being fuscous whitish with a well-defined narrow dark brown margin. Wings without apical brownish tinge.

Humeral and prescutellar callosities, and upper pleuræ,

brownish yellow. Thorax and scutellum, and lower pleuræ, brownish black. Legs yellowish brown, tarsi darker. Head black, thorax with short yellowish pubescence. Tegulæ obscure whitish, or with a fuscous tinge, possessing a well-defined narrow dark brown border. Knob of halteres brown. Abdomen brownish, hind borders of segments yellowish white. Wings subhyaline, costal margin brown distally and more yellowish basally.

This species differs from *O. pallidipennis* Lw. in the blackish scutellum, yellowish outer humeral callosities and pleuræ, and more distinctly margined tegulæ. From *O. melampus* Lw., it differs in the yellowish humeral and prescutellar callosities, yellowish pleuræ and much smaller size and lighter coloring.

The notes on the following two species of *Oncodes* collected by myself, are introduced here by kind permission of the Academy, while on the subject of this family.

30. *ONCODES MELAMPUS* Loew. San Francisco Mt., Arizona. One specimen taken in fir zone, July 15. It agrees well with Loew's description. Wings hyaline, tegulæ watery white and blackish margined. Wing veins brown. Legs brownish black. Length, about 6 mm.; of wing, $6\frac{1}{2}$ mm.

This species was described from California.

31. *ONCODES PALLIDIPENNIS* Loew. Dixie Landing, Va., May 25, a very light brownish yellow specimen; and Washington, D. C., June 1, a normal brown specimen. The lighter yellowish specimen is apparently only an immature individual.

I refer these somewhat doubtfully to this species on the distinctions given by Loew (*Centur.*, vi, 32), otherwise I would be inclined to refer them to *O. dispar* Macq. The tegulæ are more whitish than yellowish, very nar-

rowly and faintly fuscous marginate, the halteres are black except the pallid stalk, and the wings have no stigmal spot, but the two costal veins are brown distally. The small humeral callosities are yellowish, and the scutellum and prescutellar callosities are brownish yellow. I mention these points because Osten Sacken states in the Biol. Centr.-Am., Dipt. (i, p. 165), that *O. humeralis* O. S. and *O. incultus* O. S. are the only North American species of the genus with the humeral callosities of a paler color than the thorax. Outside the small yellow anterior callosities, and adjoining them, there are much larger dark brown humeral callosities.

SYRPHIDÆ.

32. MICRODON VIRIDIS n. sp.

San José del Cabo, Baja California (Eisen). One female.

Length, 7 mm. Bright green. Face and front brilliant bright green, the latter with a slight bluish reflection. Face with dense whitish pile, front with less dense blackish pile. Antennæ brown, first two joints somewhat shining, third joint with an opaque whitish bloom in certain lights; third joint hardly shorter than first. Thorax green with a purplish luster in disk, scutellum bright green with two moderately approximated rather slender sharp spines. Thorax and scutellum with whitish pile. Pleuræ bright green, whitish pilose. Abdomen bright green, somewhat purplish on hind half and sides; the whole with whitish pubescence shorter than that on thorax and scutellum, but that on sides and extremity is longer than the dorsal pubescence. Venter greenish, less so on sides. Femora bright green, the tips and whole of tibiæ yellowish with a brownish tinge, hind tibiæ with a median green spot on outer surface. Tarsi dark brownish, hind metatarsi de-

cidedly incrassate. Wings nearly clear, some of the cross-veins slightly yellowish infuscated.

This species wonderfully resembles a small green bee.

33. *MICRODON XANTHOPILIS* n. sp.

California. Two specimens, ♂ ♀. Length, about 11 mm. Pile of whole body is brassy yellow, in the ♂ almost orange yellow. Antennæ brown, first joint fully as long as second and third together. Head, thorax, scutellum, and first two abdominal segments shining metallic green; rest of abdomen brown, fourth segment of ♀ nearly as long as preceding two, in ♂ much longer. Spines of scutellum not prominent. Legs brown, short golden pilose. Hind metatarsi but little swollen in either sex, as long as next two joints. Wings uniformly slightly smoky. Pile of face, front, thorax, scutellum, and base of abdomen thicker and longer than on rest of abdomen.

It differs from *megalogaster* Snow by the golden pile of abdomen, and brown coloring of latter. It is more nearly related to *megalogaster* than to *bombiformis* Towns., which is a stouter and larger species than either. In the right wing of the ♂ the stump of vein normally found in first posterior cell is absent.

34. *CHILOSIA* n. sp.?

Marin county, Cal. (Haines). One male. Length, 9½ mm. Abdomen opaque black, first segment shining black; narrow anterior border entire of second, third, and fourth segments dark metallic shining green. These green cross-bands are the only difficulty in the way of locating the specimen in this genus, with which it agrees in all other characters. It cannot be placed in *Melanostoma*, as the arista is plumose.

The thorax and scutellum are blackish green. Antennæ reddish brown, third joint largely yellowish on

basal half or more. Face entirely greenish black. Wings clear, stigma yellowish. Legs black, tibiæ and tarsi more or less yellowish, the anterior and middle pairs almost wholly so. Scutellum with marginal bristles, abdomen moderately hairy.

35. *SYRPHUS OPINATOR* O. Sack. California. One female. It agrees in all respects with Osten Sacken's description of the females which he referred to this species (as quoted by Williston in Monogr.) The metallic green portion of the front is dusted with brassy yellow pollen only posteriorly and laterally, leaving a dark shining crescent on the front border, concave anteriorly. Length, 10 mm.

36. *VOLUCELLA ESTEBANA* n. sp.

San Esteban, Baja California, Mexico (Cal. Acad. Sci.). April, 1889. A pair, ♂ ♀, *in coitu*. Length, $7\frac{1}{2}$ mm.

Small, light colored except head and thorax. Face and front pale whitish yellow, median vitta of face well defined and rather narrow, with stripe of cheeks black or dark brown. Front of female black across ocelli, near antennæ with two brown spots. The two brown spots become, in the frontal triangle, a margin along the eyes. Face and eyes whitish pilose, frontal triangle blackish pilose, also front of female above. Antennæ brown, basal joints yellowish or lighter; arista longer than third joint, blackish, densely short plumose above. Thorax shining black, with two median whitish pollinose vittæ abbreviated behind; sides, scutellum, and two longitudinally elongate spots in front of latter, pale yellowish or whitish. Pile of thorax and scutellum whitish, that of pleuræ longer. Abdomen brownish, the second and third segments broadly pale yellowish or whitish, the light col-

oring of the two segments coalescing on each side into a kidney-shaped marking. Fourth segment in female reddish-brown, with three blackish spots; in male reddish, dark in middle, and pale on sides anteriorly. Hypopygium brown. Venter of female broadly yellow on all basal region, brown apically and slenderly on median line; of male brown on base, yellow on each side, and brown apically. Pubescence of abdomen whitish, longer and more noticeable on fourth segment. Legs brown, knees and bases of all the tibiæ yellowish. Wings wholly hyaline; stigma very dilute, appearing as a small pale brown cloud, second vein regular.

37. *VOLUCELLA ESURIENS* Fabr. San José del Cabo, Baja California (Eisen). One male and one female. These are of the variety formerly known as *V. mexicana* Macq., but which should be called *violacea* Say, as the latter name has priority.

El Taste, Baja California (Eisen). September. One male and two females. Comondu, Baja California (Haines). March. One ♂. Magdalena Island, Baja California (Haines). March. One ♀.

38. *VOLUCELLA FORNAX* n. sp.

El Taste, Baja California (Eisen). September. One ♂. Considerably resembling *V. apicifera* Towns. Differs as follows from description of that species (see Trans. Am. Ent. Soc., 1895): Length, 12 mm. A well defined black facial stripe. Cheeks polished shining black. Frontal triangle with a blackish median line or vitta. Vertical triangle black. Antennæ blackish brown, second joint reddish yellow. Arista nearly bare. Pleuræ with white pile. Prescutellar parallelogram emarginate in middle anteriorly, the black nearly dividing it into two square spots. Posterior black margin of second abdom-

inal segment a little widened laterally; that of third segment but slightly wider and of quite equal width throughout with a pointed projection on median line on anterior edge. Fourth segment blue-black only on posterior half, the anterior portion widely yellowish like other light portions of abdomen, only a narrow median line running forward from black but not reaching base of segment. Abdomen with white pile, except on black hind margins of second and third segments and a narrow space of the yellow in front of them, on which is black pile. Venter light yellowish black apically. Bases of all the tibiæ reddish yellow. Wings clear glassy hyaline, with rich brown clouds on small cross-vein, basal portion of third vein, second vein beyond the origin of third to opposite stigma, stigma and auxiliary and first veins opposite, and cross-veins at distal end of second basal cell.

A very elegant species.

39. *VOLUCELLA HAAGH* Jaenn. El Taste, Baja California (Eisen). September. Two males. One specimen seems to have the eyes contiguous for a somewhat greater extent than the other.

40. *VOLUCELLA ISABELLINA* Willist. Tucson, Ariz. One male. Dr. Williston describes only the female in his monograph (p. 140). The present male specimen measures only $13\frac{1}{2}$ mm. in length. The honey-yellow stripe on each side of thorax between humerus and scutellum is faint. The scutellum is blackish at base. The thorax has seven narrow black vittæ, counting one on each side on outer edge of the faint honey-yellow stripe, the three outer vittæ on each side converging posteriorly, and the middle vitta ending posteriorly in a transverse dark line bordering the yellowish prescutellar parallelogram. The first abdominal segment is yellowish, except

a broad median area and an isolated lateral spot black. Venter with four median black spots, the anterior one at base of second segment small, the second and third (on posterior borders of second and third segments respectively) successively larger, and that on anal segment very large.

El Taste, Baja California (Eisen). September. Two males in company with many *V. megacephala*. These agree well with the Arizona specimen. One, however, has the facial stripe obsolete.

41. *VOLUCELLA LUCASANA* n. sp.

El Taste, Baja California (Eisen). September. One ♀. Length, 8 mm. This species differs from *V. tolteca* as follows:

Length, 8 mm. A blackish vertical stripe down the eyes. Cheeks yellow with a broad black stripe anteriorly, broader above. Median facial stripe broadened above. Scutellum wholly blackish. Legs wholly blackish, the bases of front and middle tibiæ slightly tawny. Wings with a brown cloud on anterior outer half, following the distal veins of wing posteriorly to discal cell, and embracing a cloud on small cross-vein and a very much fainter one on cross-veins at distal end of second basal cell. Discal cell hyaline, first posterior mostly hyaline, submarginal narrowly hyaline on proximal portion.

42. *VOLUCELLA MEGACEPHALA* Lw., Willist. El Taste, Baja California (Eisen). September. Sixteen females and fourteen males. These seem to agree with the three specimens from Arizona and Mexico mentioned by Williston in his monograph (p. 146), except that there is a faint median pair of vittæ on thoracic dorsum between the broadly separated vittæ. There are fine black bristly hairs on lower edge of margin of scutellum. This spe-

cies is to be distinguished from *V. isabellina* Will. by the absence of brown lines on face and cheeks, by more extensive contiguity of eyes in male, by the much smaller vertical triangle, and by the black of hind margins of second and third abdominal segments being obsolete.

The specimens differ from Williston's description of *lata* (Biol. C.-A., Dipt., iii, 45-6) by having the hairs of front and face wholly black; the antennæ not what I should call "very small"; the dorsum of thorax with four faint blackish cinereous stripes, the lateral ones abbreviated before, the middle ones behind; and by the segments of the abdomen being of a more uniform smoky yellowish. They can hardly be that species.

43. *VOLUCELLA SODOMIS* n. sp.

El Taste, Baja California (Eisen). September. Two ♂. Differs from *V. estebana* as follows:

Length, 8 mm. Frontal triangle wholly shining polished black, extending below base of antennæ on each side in a tuberculous extension, strongly convex. Abdominal markings nearly the same, but the second segment more broadly blackish on median portion of disk. Venter darker. Wings distinctly flavous on anterior half or more.

44. *VOLUCELLA TOLTECA* Towns., Trans. Am. Ent. Soc., 1895. El Taste, Baja California (Eisen). September. One female and one male. Length, 8 mm. These agree very closely with the ♂ specimen from Guanajuato, Mexico, which is described in Contrib. Dipt. N. A. i, in Trans. Am. Ent. Soc., 1895. They differ only in being smaller, and in the posterior black border of second abdominal segment quite reaching the lateral margin. I am inclined, however, to regard them as the same species. The brown clouds of wings are less distinct.

45. *ERISTALIS LATIFRONS* Lw. San Francisco county, Cal. One male in bad condition is doubtfully referred to this species.

46. *ERISTALIS OBSOLETUS* Wied. El Taste, Baja California (Eisen). September. Thirty-one females. Length, 9 to 12 mm. The scutellum is quite yellow, with only a tinge of ferruginous. The spots of second abdominal segment are obscure reddish, rarely with a yellowish tinge.

47. *ERISTALIS TENAX* L. California. Two males, two females, and the puparium from which one of the males emerged.

48. *ERISTALIS TRICOLOR* Jaenn. El Taste, Baja California (Eisen). September. Two males and two females. Hind tibiæ narrowly yellow at base, front tibiæ yellow on nearly basal half, middle tibiæ and metatarsi almost wholly yellowish. They have the abdomen more extensively clear yellow than a specimen from Guanajuato.

49. *XYLOTA* sp. aff. *OBSCURA* Lw. California. A single male specimen in bad preservation seems to come nearest to this species. It differs from description as follows:

Length, 11 mm. Antennæ brown, arista yellowish. Scutellum purplish, same color as greater part of abdomen. Abdomen blackish; second segment on each side anteriorly, third more broadly on each side and on hind border, and fourth almost entirely shining purplish. Base of tibiæ brown like rest of legs. Abdomen rather whitish pilose.

50. *SYRITTA PAPIENS* L. California. One female.

CÆSTRIDÆ.

51. *CUTEREBRA AMERICANA* Fabr. California. One female, 22 mm. long. I refer this specimen here although there is no visible yellowish or even whitish pile on pleuræ, which are covered with short thin blackish pile, with hardly a lighter tinge in some lights. Abdomen dull purplish.

32. *CUTEREBRA FONTINELLA* Clk.; Towns., *Insect Life*, v, 317-320. San Joaquin Valley, Cal. May 7. Two females, with the puparia from which they emerged. These both have the grayish bloom containing black spots extending well up on the dorsum of second and third abdominal segments (see description in *Insect Life*, l. c.) The anterior elongate whitish pollinose marking of front mentioned in my description is divided into two in both specimens, thus making three equal rather triangular markings arranged in form of a triangle. The two small round spots of cheeks are brown and shining, being simply the denuded surface, like a callosity without pollen. There is a velvet-black pollinose triangular spot on each side of facial depression at lower extremity of frontal wrinkle.

TACHINIDÆ.

53. *DEJEANIA RUTILIOIDES* Jaenn. California. Two female specimens.

54. *SAUNDERSIA SIGNIFERA* Willist. California. One female.

55. *BLEPHARIBEZA RUFESCENS* Towns. California. One ♂ I am inclined to identify with this species. It agrees well with the description, but the rufous portions of abdomen are of a darker shade. Length, 11½ mm.

56. *JURINIA APICIFERA* Walk. San José del Cabo,

Baja California (Eisen). One female. The face is more silvery and not so yellowish as in northern (Michigan) specimens.

El Taste, Baja California. Two females and two males.

57. *JURINIA LATERALIS* Mcq. San José del Cabo (Eisen), and San Esteban (Haines, April), Baja California. One ♂ from each locality I am inclined to refer to this species.

58. *MICROPALPUS* sp.? El Taste, Baja California (Eisen). September. Two ♀. These greatly resemble *Echinomyia thomsoni* Will., but the eyes are hairy and third antennal joint is much longer than second. Length, 9–10 mm.

59. *PHASIOPTERYX BILIMEKI* B. & B. San Julio and San Esteban, Baja California (Haines). April. One ♀ from each locality I refer doubtfully to this species. But the neuration is not as in v. d. Wulp's figure (Biol. C.—A., Dipt., ii, pl. 4, fig. 12), the second vein being much longer and nearly parallel with the costa, and the costa being bulged basally somewhat approaching the form of the male wing.

MUSCIDÆ.

60. *COMPSOMYIA MACELLARIA* Fab. San José del Cabo and El Taste, Baja California (Eisen). Numerous specimens, normal. San Julio, Baja California (Haines). April. One female of bluish tint.

Margarita Island, Baja California (Haines). March. One ♀, normal.

OSCINIDÆ.

61. *OSCINIS COLLUSOR* n. sp.

San José del Cabo, Baja California (Eisen). Seven specimens.

Length, $1\frac{1}{3}$ to 2 mm. Head and thorax shining black, somewhat metallic. Front immediately next antennæ, and face, yellowish. Antennæ yellowish, blackish distally. Abdomen light yellowish on venter and base of dorsum, dorsum of third segment more or less brownish or blackish, of fourth or fifth shining blackish. Third segment sometimes dark only in middle and on sides. Second segment with a dark spot in middle. Legs yellow. Wings clear.

This species is a very annoying one to travelers, causing irritation of the eyes and the disease known as "mal de ojo." Its native name is "bovito."



