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XXXIX.—Contributions from the New Mexico Biological Station.—V. Some New Hymenoptera from the Mesilla Valley, New Mexico.

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Heniocha dyops.*Saturnia dyops*, Maass. & Weym. Beitr. Schmett. ii. fig. 21 (1872).

I acquired a fair series of specimens of this species at Pretoria, and found it to be very variable in markings. One specimen agrees with the typical figure in having the ocellated spot of the anterior wings connected with the transverse fascia; in all other specimens they are more or less widely separated. The discal spot to the posterior wings is sometimes very distinct, or absent on one wing, or totally wanting on both; the inner transverse fascia to the same wings is either complete or sometimes abbreviated.

I have not seen the type of *H. marnois*, Rogenh., but from the description think it is but a varietal form of *H. dyops*; and as Mr. Rothschild is inclined to unite Rogenhofer's species with *H. bioculata*, Auriv., there must, if my surmise is correct, be considerable synonymy among the species of the genus.

XXXIX.—Contributions from the New Mexico Biological Station.—V. Some new Hymenoptera from the Mesilla Valley, New Mexico. By T. D. A. COCKERELL.

Apidæ.

Centris cæsalpinia, sp. n.

♀.—Length 15–18 millim.

Black; head and thorax with pale ochraceous pubescence, short and very dense on thorax, clypeus and sides of front bare. Eyes, clypeus, labrum, and basal three fifths of mandibles crimson. Clypeus shining, very sparsely punctured. Mandibles truncate at tips and with four denticles, alternating large and small, on inner side. Some very long hairs spring from near the base of the mandibles beneath. Antennæ black, the end of the scape slightly tinged with rufous. Front very broad, inner orbits parallel. Tegulæ whitish. Wings smoky hyaline, nervures and stigma fuscous, third submarginal cell narrowed more than half to marginal, no distinct stump of a nervure springing from lower outer corner of third submarginal. Legs black or dark piceous, with black pubescence, and more or less pale brownish pubescence on the four anterior legs; hind tibiæ and basal joint of tarsi broadly dilated, with dense black hairs. Claws large, rufous at base, seeming to be entire, but

when seen from above a small denticle is visible on the inner side. Abdomen almost bare, what little pubescence there is is black, except some pale pubescence at base of first segment. Apex with very dark blackish-brown hairs. Pygidium rufescent at base, narrow at end, longitudinally sulcate on each side.

♂.—Length 16 millim.

Eyes olive-green; clypeus and labrum bright lemon-yellow; scape wholly dark; mandibles dark reddish brown, with black tips; claw-joints rufous; legs with more pale pubescence; hind femora broad, the pubescence without pale, except at end. Apex of abdomen with pale hairs.

Var. nov. *rhodopus*.

♀.—Length 12–13½ millim.

Scape rufous in front; mandibles sharp at tip; femora and tibiæ rufous. Segments 2 and 3 of abdomen with narrow lateral pale hair-bands on hind margin.

♂.—Length 11½–12½ millim.

Scape yellow in front. Mandibles more or less yellow without. A small yellow spot on each side between clypeus and orbital margin. Legs more or less rufous. Hind femora with the long hairs on outer side white, strongly contrasting with the spreading black hairs of the first tarsal joint. First segment of abdomen covered with pale almost silvery pubescence. Segments 2 to 4 with lateral apical white bands, that on 2 becoming very broad at the side. Wings clear.

Hab. Mesilla Valley, New Mexico. A typical female was taken by the late Mr. S. Steel at Las Cruces, May 17, some years ago. This year, on May 18, I caught on the College Farm, at flowers of *Cæsalpinia falcaria*, 3 ♀, 1 ♂ of the type, and 2 ♀, 2 ♂ of the var. *rhodopus*. It is probable that the var. *rhodopus* represents a distinct species.

Centris Hoffmanseggia, sp. n.

♂.—Length 12 millim.

Black, with white pubescence, that on thorax above tinged with ochraceous. Eyes greyish, front narrow, hardly as broad as an eye, scape wholly black; clypeus, a line above transversely, labrum, and basal portion of mandibles yellowish white. Mandibles rufous at the junction of the white with the black ends; a strong inner denticle. Clypeus bare, with sparse shallow punctures. Pubescence of thorax dense. Tegulæ reddish testaceous. Wings hyaline, nervures and

stigma piceous. Third submarginal narrowed about one half to marginal. A dark shade looking like a stump of a nervure at lower outer corner of third submarginal. Pubescence of legs wholly pale, hind legs not dilated, the white hairs long on outer side, but not forming a broad dense mat, as in other species. Claw-joints and basal half of claws rufous. Claws deeply bifid. Abdomen with short greyish-white pubescence, tolerably dense on first two segments, sparse on the others, giving way to fuscous on 4 and 5, but the hind margins with narrow thin white hair-bands. Apex with white hairs.

♀.—Length 12–14 millim.

Very much like the female of *caesalpinia*, with the same broad black brush of hairs on the hind legs, the same black abdomen, &c. The thoracic pubescence averages paler than in *caesalpinia*. Eyes grey. Clypeus and labrum dull orange-yellow, the upper corners of the clypeus more or less black, frequently the whole upper margin of the clypeus broadly black. Scape wholly black. Mandibles rufous, with black ends and base. Pubescence of abdomen very sparse and black, first segment sometimes with pale pubescence, but never the second. Claws small, with a little tooth within. Wings smoky hyaline. Front broad, inner orbits parallel.

Hab. College Farm, Mesilla Valley, N. M., at flowers of *Caesalpinia falcaria*, May 18, 1896, 1 ♂, 7 ♀.

I had at various times swept over the flowers of *Caesalpinia* (*Hoffmanseggia*) *falcaria*, var. *stricta* (Benth.), without getting any bees, and had wondered why this was. But on May 18 I observed that they were indeed visited by bees of the genus *Centris*, which were much too agile to be caught by sweeping. The *C. caesalpinia*, in its typical female, was especially hard to catch, hovering over the flowers with a curious swinging motion, darting away at the least alarm. It was interesting to find several species of *Centris*, a neotropical genus with only one hitherto recorded U.S. species, at flowers of *Caesalpinia*, a typically tropical genus of plants.

When I came to arrange all the specimens of *Centris* caught in the Mesilla Valley, I found I had four different males and four different females, presumably belonging to one another. The females are much alike, but the males present wider differences; and while I think I have the sexes properly associated, it must be admitted that there is a certain probability of error. Three of the forms—*caesalpinia*, *rhodopus*, and *Hoffmanseggia*—are described above. The fourth is *C. lanosa*, Cresson, originally described in 1872 from three males caught by Belfrage in Texas. Cresson's description is

inadequate, but I have a male from Las Cruces collected by Prof. C. H. T. Townsend, and identified as *lanosa* by Mr. Fox. I also have a male of the same collected by Mr. Alfred Holt on the College Farm, May 2, 1895. I associate with these male *lanosa* four females—one on *Caesalpinia falcaria*, May 18, 1896 (Ckll.), two on mesquite, May 13, 1895 (Alfred Holt), and one caught on May 17 by the late Mr. S. Steel, all from the Mesilla Valley.

The following notes on *lanosa* will be found useful:—

Centris lanosa, Cr.

♂.—This resembles the male of *caesalpinia*, var. *rhodopus*, in size, general structure, and appearance, and differs at a glance from the male of *Hoffmanseggia*; but it is distinguished at once from *caesalpinia* or its var. *rhodopus* by its narrow front, in which character it is like the male of *Hoffmanseggia*. The clypeus is yellow and the eyes are green, as in *rhodopus*, but the clypeus is necessarily narrower, owing to the shape of the face. The first segment of the abdomen is covered with pale hairs, but the other segments show no pale hair-bands. The hairs at the tip of the abdomen are dark or, at most, slightly pallid, not conspicuously pale as in *caesalpinia* and *rhodopus*. The scape in my examples is dark, though Cresson's description reads otherwise.

♀.—I had mixed what I now consider to be female *lanosa* with female *Hoffmanseggia*, and probably would not have separated them but for the necessity of finding females for the very different males of these species. The female *lanosa*, however, average decidedly larger than the *Hoffmanseggia*, and the second abdominal segment, as well as the first, is delicately pruinose. The claws also are noticeably larger and the black upper margin of the clypeus is broader, so that the yellow or orange is reduced to the shape of a half-circle.

The following tables may be found convenient:—

Females.

Clypeus crimson	1.
Clypeus yellow or orange, its upper border more or less black	2.
1. Length over 14 millim.; legs black	<i>caesalpinia</i> , Ckll.
Length under 14 millim.; femora and tibiae rufous	<i>rhodopus</i> , Ckll.
2. Second abdominal segment pubescent	<i>lanosa</i> , Cr.
Second abdominal segment bare	<i>Hoffmanseggia</i> , Ckll.

Males.

Front broad	1.
Front narrow	2.

1. Length over 14 millim.; scape without yellow *cæsalpinia*, Ckll.
 Length under 14 millim.; scape yellow in front *rhodopus*, Ckll.
 2. Abdomen with narrow hair-bands; clypeus yellowish white *Hoffmanseggia*, Ckll.
 Abdomen without hair-bands; clypeus lemon-yellow *lanosa*, Cr.

Mr. Fox has suggested (Proc. Cal. Ac. Sci. 1893, p. 22) that *lanosa* is very likely identical with *mexicana*, Smith. *C. mexicana* was described from a female, which is at all events quite different from that which I have here referred to *lanosa*. I am much indebted to Mr. L. O. Howard for sending me copies of a number of descriptions of *Centris* to which I had not access.

Perdita perpulchra, Ckll., 1896.

This species was described from the female only. The male is new. It is slightly smaller than the female, and the light markings are all lemon-yellow. The face is all yellow beneath the level of the antennæ, except the usual clypeal dots and a little black round the dog-ear marks; supra-clypeal mark much broader than long, extending only as far as lower level of antennal sockets, while the lateral marks end broadly at the higher level. Cheeks unarmed. Eyes sage-green. Scape wholly yellow. Prothorax with less pale colour, but the hind margin continuously yellow. Metathorax bluer. Hind femora black above, except terminal fourth. First segment of abdomen with more black; bands on remaining segments reduced, more or less broken into spots. Apex yellow, inclining to orange. Venter yellow, with a series of transverse black patches.

Hab. College Campus, Mesilla Valley, N. M., on *Verbesina encelioides*, Sept. 16, 1895 (*Miss MacGilmore*).

In my key to the species of *Perdita* (Proc. Ac. Nat. Sci. Philad. 1896, p. 48) this will fall in with *sphaeralceæ* ♂, from which it is readily distinguished thus:—

- Stigma margined with brown; venter of abdomen im-maculate in middle *sphaeralceæ* ♂.
 Stigma pale orange, not margined with brown; venter with a series of large black patches down the middle. *perpulchra* ♂.

Perdita erigeronis, sp. n.

♂.—Length $4\frac{1}{2}$ millim.

Head tolerably large, cheeks unarmed, bearded with white

hairs; colour of head dark green, face below antennæ wholly bright lemon-yellow, the yellow sending a short rather broad projection upwards in the median line, and laterally extending to the same level on the orbital margin, just to the lower end of the anteorbital pit, broadly, obliquely truncate as in *affinis*. A small projection passes from the lateral marks over the bases of the antennæ. Cheeks dark, but a narrow yellow stripe passes halfway up the orbital margin. Vertex very distinctly granular. Scape yellow, with a black stripe above; funicle yellow below, black above; flagellum dark brown, more or less yellow beneath. Thorax dark green, minutely sculptured and rather dull; metathorax dark blue. The metathorax may be also green, but then of a bluer green than the mesothorax. The pleura may become bluish. Mesothorax with sparse punctures, parapsidal grooves distinct. Pubescence of thorax sparse, tinged with ochreous on dorsum. Legs black; knees, stripe on anterior femora, anterior and middle tibiæ and tarsi in front yellow. Tubercles and two patches on hind border of prothorax yellow. Pleura wholly dark. Wings hyaline, iridescent, nervures and stigma dark sepia-brown; stigma hyaline in middle, third discoidal cell distinct; marginal cell appendiculate, its post-stigmatal portion about as long as the substigmatal; second submarginal narrowed about half to marginal. Abdomen piceous, with bright yellow clean-cut bands, interrupted in the middle, on the first three segments. The degree of interruption is variable and the band on the third segment may be reduced to two narrow stripes. Extreme tip of abdomen orange-brown. Venter dark.

Hab. Three males on flowers of *Erigeron divergens* (det. E. O. Wooten) at the Woodlands Orchard, Mesilla, N. M., May 9, 1896.

This greatly resembles the male of *P. affinis*, but is smaller and undoubtedly distinct. I am now persuaded that what I considered to be the male of *P. rectangulata* really belongs to *affinis*. *P. erigeronis* also resembles *P. fallax*, but that has white abdominal marks. It is, moreover, a vernal species, while *fallax*, *affinis*, and other allied forms are autumnal.

On the *Erigeron*, at the same place and time, I took one *Augochlora pura*, Say, ♀, and an *Halictus*.

Podalirius Lesquerellæ, sp. n.

♂.—Length about 14 millim.; width of abdomen 5 millim.; length of anterior wing $8\frac{1}{2}$ millim.

Stoutly built, black, the pubescence short, close, delicate

grey, tinged with ochraceous on the metathorax, white on the face and underside of body. Clypeus except its lower margin, labrum except its lower margin, and lateral face-marks primrose-yellow. Lateral marks triangular, rapidly narrowing above on orbital margin. Anterior edge of labrum with a small round notch. Pubescence of face dense. Mandibles wholly black, with a large denticle on the inner side. Antennæ black, scape chrome-yellow in front, first joint of flagellum very long. Eyes olive-green. Thorax densely pubescent, scattered black hairs mixed with the pale ones, as is also the case on vertex. Tibiæ and tarsi grey pubescent on outer side; hind femora with long hairs, black and white intermixed. Last joint of middle tarsus with a very broad brush of black hairs on each side, the outline of the two brushes together making about a circle. Claws rufous, with black ends, deeply cleft. Tegulæ piceous; wings hyaline, marginal cell appendiculate. Abdomen with the first segment densely pubescent, the others with only short bristles, which do not conceal the surface. Hind margins of second and following segments narrowly testaceous. Apex truncate, very broadly and shallowly emarginate. Ventral segments with thin bands of white hairs.

Hab. Little Mountain, Mesilla Valley, N. M., three on flowers of *Lesquerella Fendleri*, April 1, 1895 (*Jessie Casad*); College Farm, Mesilla Valley, one on *Lycium*, April 16, 1895 (*Jessie Casad*).

Of the species found in the Mesilla Valley this most resembles *A. (P.) urbana*, Cr., which I have taken on *Solanum* at Las Cruces, July 13, the specimen having been determined by Mr. Fox. It is distinguished at once from *urbana*, however, by the black brush on the middle tarsi. It agrees with nothing in Dours's monograph, but is evidently close to *Anthophora Crotchii*, Cresson, from which it differs by its dark mandibles, colour of pubescence, &c.

Alcidamea biscutellæ, sp. n.

♂.—Length about 13 millim.

Rather stoutly built; in size, colour, pubescence, and general appearance much like *Andrena electrina*, which occurs in the same vicinity. Black, pubescent, the pubescence white, becoming mouse-grey on dorsum. Head somewhat broader than long, face covered with long silky white hairs, which radiate from the centre; vertex sparsely hairy in middle, bare at sides, shining, strongly punctured; mandibles black; antennæ black, scape gradually broadening to

the end, flagellum not so stout proportionately as in *A. producta*, last joint coming to a curved point, all the joints flattened. Cheeks and occiput quite hairy, occipital hairs greyish. Dorsum of thorax with erect, rather thin grey pubescence; mesothorax and scutellum shining, strongly punctured. Metathorax smooth and shining at base; pleura with long white hairs. Legs black, with white hairs. Claws rufous, with black tips, which are bifid, the inner denticle being shortest. Tegulæ shining piceous; extreme base of wings rufescent. Wings hyaline, marginal cell and outer margin broadly smoky. Nervures and stigma piceous, second submarginal cell very long. Marginal cell more pointed than in *A. producta*. Abdomen strongly punctured, black, with thin greyish-white pubescence, hind margins of segments with narrow continuous white hair-bands. Hind margin of fifth ventral segment excavated roundly, with a broad conspicuous brush of appressed tawny hairs. Tip of abdomen strongly tridentate, the teeth widely separated, the middle one longest and narrowest, the lateral ones obliquely truncate. The lateral teeth are much more developed than in *A. producta*.

Hab. Close to the Agricultural College, Mesilla Valley, N. M., on *Biscutella Wislizenii*, April 20, 1896 (*Prof. E. O. Wootton*).

A very distinct species, much larger than *A. producta*, which it most nearly resembles in the apex of the abdomen.

Chrysididæ.

Chrysis bigelovici, sp. n.

Length about 5 millim.

Deep blue, with green reflections; occiput, anterior margin of mesothorax, postscutellum, metathorax, and margins of abdominal segments more or less purple. Punctures large and close, somewhat smaller on abdomen than on thorax. Basin of face minutely punctured; sides of face and a transverse patch above the antennæ with glittering white pubescence. A transverse carina on front, somewhat angled in the middle. No tubercles on vertex. Scape and funicle green; flagellum piceous, the first three joints white beneath, with short silvery pubescence. Parapsidal grooves strongly curved. Lateral tooth of metathorax long. Tegulæ with an elongate white patch. Wings hyaline, nervures piceous. Knees, bases of tibiæ, and tarsi more or less white, nearly the basal half of hind tibiæ white, terminal joints of tarsi

fuscous. Abdomen with only the faintest indication of a median ridge on second segment; covered bases of segments black. Margin of third segment strongly bidentate, the notch between the teeth broad and deep, the teeth large, the margin beyond them gently curved, nearly straight, not angled, narrowly white. Pits about sixteen in number.

Hab. Las Cruces, New Mexico, on *Bigelovia Wrightii*, Sept. 23, 1895.

Structurally this is almost exactly like *C. mesillæ*, but it shows none of the crimson colour of that insect, and the parapsidal grooves of *mesillæ* are almost straight. It resembles also *C. perpulchra*, Cr., but that has the basin of face cross-striated, and *C. quadrituberculata*, Cam., but that has tubercles on the vertex.

Pemphredonidæ.

Ammoplanus salicis, sp. n.

♀.—Length about $4\frac{1}{2}$ millim.

Shining black, naked, with brilliant silvery pubescence on face and cheeks and very sparse short pubescence on pleura and abdomen. Head large, quadrate, broader than long. Eyes converging below, front rather sparsely punctured, median groove very distinct, scape yellow in front, funicle yellow at extreme apex, flagellum piceous black. Anterior median edge of clypeus broadly truncate, the truncation with a notch on each side. Mandibles black at extreme base, rufous at tips, otherwise white, with a conspicuous denticle on the inner side, perhaps a little nearer to the base than the apex. Mesothorax rather sparsely punctured, scutellum obscurely punctured, tubercles with a yellow spot, basal middle of metathorax smooth. Knees, anterior and middle tibiæ except a black stripe behind, basal two fifths of hind tibiæ, and basal joints of tarsi cream-colour or very pale yellow. Ends of tarsi rufescent. Tegulæ dark testaceous. Wings hyaline, nervures and stigma black. Marginal cell about or nearly as long as first (and only) submarginal, but not so broad, its apex broadly truncate. Recurrent nervure joining marginal cell at its middle. Abdomen rather small, punctures minute and scattered, first segment smooth. Pygidium with strong sparse punctures.

Hab. Las Cruces, New Mexico, on *Salix*, May 2, 1896.

The silvery hairs of the face are broad and flattened, representing the first advance towards plumosity. A smaller species of *Ammoplanus* is found at Santa Fé.

Chalcididæ.

Spilochalcis mesillæ, sp. n.

♀.—Length about 7 millim. or slightly over.

Head and thorax bright yellow, marked with black and a little rufous; first four legs yellow; abdomen (except the yellow petiole) and hind legs bright orange-rufous. Head with obscure shallow punctures; thorax with large punctures, largest and closest on scutellum, which becomes almost subcancellate; mesonotum transversely striate, the striæ much stronger and amounting to grooves in the middle; scutellum unarmed; abdomen smooth and shining, hind femora duller but smooth; petiole short, not half length of hind coxæ; hind femora with 16 minute teeth. Abdomen rather long, pointed, exclusive of petiole about as long as head and thorax. Antennæ black, funicle rufescent, scape yellow in front; occiput black, sending a black line forward between the ocelli to enlarge to a broad black frontal band, extending down to the antennal sockets. Mandibles bifid at apex, which is black. Thorax with a black median band running its whole length antero-posteriorly, pinched at hind margin of pronotum; on pronotum a little and on mesonotum in front broadly bordered with rufous. Thoracic sutures narrowly black; sides of metanotum with an elongate patch, black in front, rufous behind; anterior part of pleura black; middle coxæ marked with piceous; hind coxæ with a broad black stripe on outer side; femoral teeth darkened, but no marks on hind femora; abdomen immaculate, ovipositor slightly projecting, black.

Hab. Las Cruces, N. M., near to the Agricultural College, on *Bahia* or some similar Composite, Oct. 5, 1895.

A very pretty species.

XL.—Descriptions of further new Species of Butterflies from the Pacific Islands. By H. GROSE SMITH, B.A., F.G.S., F.Z.S.

Delias callistrate.

Male.—Upperside. Anterior wings white, with the apex broadly greyish black, the black apical area extending from the costa at one third from the apex, thence narrowing across the disk to a little below the lowest median nervule on the outer margin, base and costal margin narrowly grey; near