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T. D. A. Cockerell

University of Colorado

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New and Little Known Bees

BY

T. D. A. COCKERELL.

(Reprint from Transactions American Entomological Society, Vol. XXXVII, No. 3)

Issued August 24, 1911

NEW AND LITTLE KNOWN BEES.

BY T. D. A. COCKERELL.

Sphecodes chionospilus n. sp.—♂. Length about $7\frac{1}{2}$ mm.; head and thorax black; abdomen red, the apical segments dusky, the hind margins of the segments (the second and third very broadly) reddish-golden; legs reddish-black, the knees, hind tibiae at base and apex, and all the tarsi, ferruginous; spurs pale testaceous; tegulae creamy-white, testaceous at base; wings hyaline, dilutely infuscated apically, stigma and nervures brown-ferruginous. Head transversely oval; eyes converging below; face and front very densely covered with snow-white pubescence; mandibles dark ferruginous; cheeks and upper part of head with white hair; antennae dark reddish, long, very strongly moniliform; scape short; second and third joints very short, twice as broad as long; fourth nearly twice as long as second and third together; mesothorax and scutellum shining, with very large scattered punctures; metathorax above rounded, shining, very coarsely cancellate; upper border of prothorax, mesothorax in front, scutello-mesothoracic suture, postscutellum and pleura (the last irregularly) covered with white hair; abdomen shining, with strong widely separated punctures, base of second segment depressed; last ventral segment with a shallow median longitudinal depression.

Variety ***sanguinatus*** n. var.—♂. Legs entirely bright ferruginous red, with white hair on tibiae and tarsi; metathorax above not clearly cancellate, but irregularly roughened, the rugae more or less evidently longitudinal. This looks at first like a distinct species, but every essential detail is as in *chionospilus*, and it can hardly be more than a variety.

♀. Length about 9 to 10 mm., differing from the male in the usual sexual characters, but otherwise similar; mandibles with an inner tooth, far from the apex; flagellum thick, suffused with dark reddish; legs dark with the tibiae and tarsi more or less reddish, or (var. *sanguinatus*) entirely red; mesothorax and scutellum black, or (var. *sanguinatus*) dark reddish; hind tibiae densely covered with white hair on outer side; hind spur microscopically serrulate; tongue sharply pointed, about 400 microns long; last five joints of maxillary palpi in microns (2.) 128, (3.) 128, (4.) 96, (5.) 112 (6.) 64.

Habitat.—Karachi, N. W. India, May and June, 1909, (*E. Comber*). British Museum. In a number of characters this resembles *S. indicus* Bingham, but that has the male entirely black, and the hair on the tarsi ferruginous-brown instead of

white, From *S. rubripes* Spin. it is easily known by the pallid tegulæ, wherein it resembles *S. ruficornis* Sich. and *S. rufithorax* Mor. There is much resemblance to *S. desertus* Nurse, but that has the abdomen very finely and closely punctured.

***Sphecodes lautipennis* Ckll.**

This species was described from Boulder County, Colo. Its range is greatly extended by a couple of males taken by Mr. W. M. Mann at Pullman, Washington State, Sept. 13, 1908.

***Sphecodes hesperellus* Ckll.**

Two males from Pullman, Wash., Aug. 2, 1908 (*W. M. Mann*).

***Sphecodes arroyanus* Ckll.**

This species has been known from New Mexico and Colorado; its range is greatly extended by a female taken by Mr. J. B. Wallis at Lethbridge, Alberta, July 4, 1909. It differs from southern examples in having the mandibles dark red in the middle. It might be confused with *S. clematidis* Rob., but is easily separated by the large broad head.

***Nomia exagens* (Walker) Meade-Waldo.**

At my request Mr. G. Meade-Waldo has kindly examined the type of *Andrena exagens* Walker, 1860, from Ceylon, and as was expected, finds it to be a *Nomia*. It is about $5\frac{1}{2}$ to 6 mm. long. It appears to be related to *N. basipicta* Wickwar, also found in Ceylon.

***Nomia muscatensis* Ckll.**

This species, described from Muscat, Arabia, must be added to the fauna of India, having been taken by Mr. E. Comber at Karachi. Mr. Meade-Waldo informs me that it was known to F. Smith, who gave it a manuscript name. One female is labelled "Hab R., Karachi, Sept. 1909." The male, hitherto undescribed, has also been taken at Karachi by Mr. Comber: one has the date October, 1909. It has the following distinctive characters:

♂. Tegument of thorax black, with the tubercles, the lateral scutellar lobes and the greater part of the postscutellar process ferruginous; antennæ entirely ferruginous, of a darker shade above; hair of face

dense and very white; hair of thorax and legs white; legs bright ferruginous; hind femora greatly incrassated, triangular; hind tibiae with a very large broadly rounded lamina, flat above; abdominal bands on segments 1 to 5, white or creamy white, flushed with green.

In the Karachi females the tegument of thorax varies to practically all black except the upper border of prothorax, the hind margin and lobes of scutellum, and the postscutellar process, which are red; the abdominal bands also show a little green. The abdomen is rather rougher and more densely punctured in the male, but the difference is not very conspicuous. The hind tibial lamella of the male is not so long as in *N. lamellata* Smith, and there is no tooth or prominent angle near the middle of the hind margin. *N. bahadur* Nurse, from Deesa, is also a *Crocisaspidia*, but has interrupted bands.

Nomia callichlora n. sp.—♀. Length about $9\frac{1}{2}$ mm.; black, the abdomen with broad bright green bands (the first three flushed with vermillion) on the first four segments; postscutellum with two strong black teeth, close together; middle of face and clypeus with a delicate keel; mandibles dark red in middle; flagellum ferruginous beneath. Very close to *N. elliotii* Smith, which it resembles in most respects, it is however readily separated as follows (the *elliotii* used for comparison is from F. Smith's collection): rather smaller; face narrower, covered with white hair; mesothorax smaller, more shining, with smaller punctures, a band of grayish-white hair running along lateral and hind margins, and the disc with much pale hair (dark fuscous hair in *elliotii*); hair of outer side of middle tibiae entirely white (with a subapical fuscous patch in *elliotii*); green abdominal bands about twice as broad.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum. A male from Karachi appears to belong here, having just the same pubescence and general structure, but it has the scutellum more or less bituberculate, and the abdominal bands are narrow as in *elliotii*, and very pale. There are bands only on the first four segments, the fourth band being white, while the others are white at the sides and flushed with pale green and red in the middle. The hind legs are formed as in *N. elliotii*. I should have referred this male to *N. elliotii* in the absence of the female, but I have no authentic male *elliotii* to compare.

Nomia curvipes (Fabr.).

Nasik, Western India, ♀ (*E. Comber*). A male from F. Smith's collection is labelled "India, Nudda."

Nomia eburnigera n. sp.—♂. Length $10\frac{1}{2}$ –11 mm.; black, the head and thorax with short sordid-white pubescence, more evidently ocherous on scutellum, dense around borders of mesothorax and scutellum, but sparse on disc, the black surface, shining and very densely punctured, clearly visible; face narrow, eyes converging below; tongue narrow and sharp, but not much over 1 mm. long; basal part of mandibles broadly yellow; scape slender, yellow, suffused with red above; flagellum entirely clear ferruginous; tegulae moderate, light rufotestaceous; wings hyaline, more or less yellowish, dusky apically; nervures and stigma light ferruginous; second s. m. broader than usual, receiving first r. n. near its end; scutellum and postscutellum unarmed; metathorax hairy; legs (except coxae and trochanters) pale red broadly marked with canary yellow; middle femora broadened; hind femora very greatly swollen, with about the basal two-fifths red, the apical part yellow, the lower side near apex with a strong sharp tooth; hind tibiae with a long pointed apical process, which has three sharp edges; the hind tibiae are yellow, but on the outer side toward the base, where the femoral tooth overlaps when the leg is flexed, is a large dark brown spot; hind basitarsus yellow, reddish at end; abdomen black with a sericeous lustre, shallowly punctured, the hind margins of the first five segments with broad ivory-colored tegumentary bands; sixth segment broadly red at apex, with subbasal dark fuscous hairs; fifth ventral segment with a pair of median hairy projections; sixth emarginate.

♀. Similar, except for the usual sexual differences, and the abdominal bands, which are four in number, and a sort of pale orange; the hair of the thorax above is strongly reddened in three specimens, but in a fourth pallid as in the males. Antennae red; mandibles broad; clypeus very densely punctured, not at all keeled; legs red without yellow; hind basitarsus broad, angular at apex; wings more strongly colored; apex of abdomen with dark rufofuscous hair; apical plate with appressed ferruginous hair, but the margins and a fine central line bare.

Habitat.—Karachi, N. W. India, type (♂), two other males and three females, one of each sex dated "September, 1909 (*E. Comber*)"; Malir, N. W. India, one of each sex (*E. Comber*). British Museum.

Resembles *N. curvipes*, but that species is larger, with denser red hair on thorax above, abdominal bands in male highly colored, with some green, and fourth ventral segment

deeply emarginate. The structure of the hind legs is similar in both, though the tibial process is smaller and shorter in *curvipes*. *N. unidentata* Olivier, from the Arabian desert, seems to be allied, but judging from the description is smaller, and the legs of the male are without yellow.

***Nomia sykesiana* Westwood.**

A male from Nasik, Western India (*E. Comber*) appears to me to be Westwood's species, which is separable from *N. antennata* Smith by the smaller size, and broad white (slightly creamy) hair-bands on abdomen. The face is densely covered with brownish-white hair, which is not quite as Westwood describes, but his specimens was probably not in the best condition. The broad and flat last antennal joint is black. The large apical process of the hind tibia is broadly truncate, with two salient points. Tongue linear but short.

***Nomia nasicana* n. sp.—♀.** Length about $9\frac{1}{2}$ mm.; black, including the legs, but the first two abdominal segments clear bright ferruginous, and segments 1 to 4 each with a narrow apical white tegumentary band, that on the first very narrow; face broad, densely covered with glistening white hair; mandibles black with a small and very obscure reddish spot; front dullish; flagellum ferruginous beneath, and the last joint above; mesothorax shining, rather closely punctured, with thin short pale hair, denser along the margins, and scattered dark hairs on the disc; scutellum very shiny, the middle almost without punctures, with long black hair; postscutellum covered with white tomentum, unarmed; area of metathorax rather large, very black, minutely rugose, becoming obliquely striate at sides; tegulæ translucent testaceous, not enlarged; wings hyaline, faintly dusky, stigma piceous, nervures dark brown; second s. m. small, receiving first r. n. just beyond middle; b. n. strongly arched; legs with glittering white hair, pale golden on inner side of tarsi; some dark fuscous hair on outer side of hind tibia at base; abdomen with little hair, but third and fourth segments with a very narrow even basal band of white hair: hair at apex dark fuscous; first four ventral segments red.

Habitat.—Nasik, Western India (*E. Comber*). British Museum. Very close to *N. maculitarsis* Cam., from Poona, of which only the male is known. I do not think *nasicana* is the female of *maculitarsis*, as the latter has the face covered with fulvous hair. Cameron's figure of *maculitarsis* appears to have been drawn from the female of something else.

Nomia karachiensis n. sp.—♂. Length about $7\frac{1}{2}$ mm.; rather slender, black, with the first abdominal segment and the second at base and apex (the infuscation variable) red; anterior and middle tibiæ, and apices of their femora above broadly, red; hind knees red, and hind tibiæ broadly reddish at base and narrowly at apex; tarsi clear red, basal two-thirds of hind basitarsi pellucid whitish; face densely covered with pale ochreous hair; tongue very sharply pointed, but short; maxillary palpi long; mandibles obscure reddish in middle; antennæ ferruginous, scape infuscated except at ends, flagellum dusky above; thorax above densely clothed with short ochreous hair, but on discs of mesothorax and scutellum it is thin enough to make visible the very fine dense punctures; metathorax densely hairy, basal area small; tegulæ moderate, light ferruginous; wings hyaline, with a dark fuscous apical patch as in *N. terminata* Sm. and *N. kurandina* Ckll.; nervures and the large stigma pale yellowish testaceous; hind femora not modified; hind tibiæ with a prominent subapical tubercle on inner side; abdomen rather shining, very feebly punctured, hind margins of segments with dense dull creamy-white or pale ochreous-tinted hair-bands; first two ventral segments red; fourth nearly covered with a patch of pale ochreous tomentum.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum. Very near to *N. floralis* Smith, but hardly its male, owing to the quite different character of the scutellum. Vachal has described the supposed male of *N. floralis* from Canton, and while his description indicates a species close to *N. karachiensis*, there are various differences. The type locality of *floralis* is Hong Kong.

Nomia aureohirta Cameron.

Nasik, Western India, both sexes (*E. Comber*). British Museum. This record extends the known range more than 500 miles N. W. The female, before known, has the following distinctive characters: face with a large subtriangular patch of brilliantly shining yellowish hair on each side; clypeus and supraclypeal area strongly, very densely punctured, not at all keeled; mandibles black, faintly reddish in middle; scape long, black, flagellum obscure reddish beneath; hair of thorax above fulvous, but not hiding surface of mesothorax and scutellum, which are densely, minutely, granular-punctate; pleura hairy in front and bare behind: tibiæ and tarsi entirely, and anterior and middle femora broadly at apex, ferruginous; first two abdominal segments with the

hair-bands confined to the sides, but the apical tegument reddish; the anterior femora are red beneath except at base.

Nomia comberi n. sp.—♀. Length 8 mm. or rather more; head, thorax and legs black; abdomen black and ferruginous; hair of head and thorax pale ochreous-tinted, not abundant; mandibles black; face broad; face, front and vertex very densely punctured; clypeus not keeled; antennæ entirely black; mesothorax and scutellum shining, with small but strong rather dense punctures; postscutellum unarmed, covered with pale ochreous tomentum; area of metathorax with widely spaced delicate ridges, and toward its apex with some transverse ridges; tegulæ shining black; wings long, dark fuscous, stigma and nervures brown; b. n. meeting t. m.; legs with pale hair; hind basitarsus flattened, with a slight screw-like twist, and with a broad brush of orange hair at apex; second joint of hind tarsus very broad though short; abdomen shining, very delicately punctured, first two segments wholly without hair-bands, third and fourth with pale grayish bands, end of fifth with dark fuscous hair; first segment broadly red at sides, except along hind margin, the red nearly continuous in the middle line subbasally; second and third segments red with the apical margin black; fourth with a suffused red basal patch.

Habitat.—Kalutara, Ceylon, 2 ♀, March, 1910 (*E. Comber*). British Museum. Differs from *N. exagens* (Walker) by the larger size, black tarsi, dark wings, etc. Compared with *N. basipicta* Wickwar it is smaller, with differently colored legs and more red on the abdomen.

Nomia phenacura n. sp.—♀. Length about $11\frac{1}{2}$ mm.; appearance of an *Andrena*, with structure of *Nomia* (no facial foveæ, etc.); head and thorax black; legs black except hind tibiæ and tarsi, which are clear red, but the basitarsus with a large black patch on outer side; the middle tarsi may also be clear red, and their tibiæ reddish apically; abdomen with the first three segments clear ferruginous red, the others black, the hind margin of the fourth broadly testaceous-hyaline; head very broad; clypeus flat, a little depressed in middle, shining, with very large irregularly placed punctures; face and front finely rugoso-punctate, sides of front more or less ridged or striate; vertex strongly and densely punctured; hair of head and thorax pale ochreous tinted, not abundant; lower margin of clypeus with long golden hairs; mandibles dark, deeply grooved on outer side; antennæ black, flagellum reddish at apex; mesothorax and scutellum densely and minutely punctured, in entire contrast with the large coarse punctures of the vertex; postscutellum unarmed, densely covered with tomentum; area of metathorax a transverse shining band, with cross-ridges; tegulæ dark with the margin broadly rufotestaceous, not enlarged; wings

ample, yellowish hyaline, the apical field somewhat dusky; stigma and nervures orange-ferruginous; b. n. strongly covered at lower end; second s. m. a little broader than long, receiving r. n. in middle; legs with pale yellowish hair, scopa of hind legs long and loose; abdomen dullish, without any evident punctures; bands of extremely short hair at sides of second and third segments, and a continuous one on fourth; fifth and apex with pale orange-ferruginous hair; apical plate broad.

Habitat.—Nasik, Western India, 2 ♀ (*E. Comber*). British Museum. A very distinct species, unlike any *Nomia* known to me, but extremely like some *Andrena*, such as *A. erythrogastra* (Ashmead). In Bingham's table it runs nearest to *N. floralis*, to which it has little resemblance.

Nomia phenacopsis n. sp.—♀. Length fully 12 mm.; black, the hind margins of the abdominal segments testaceous-hyaline, and the parts over which they slide reddish-brown; apical part of middle tibiae, hind tibiae entirely, and all the tarsi, ferruginous; wings shorter than abdomen, the latter being long and rather narrow, but extended more than usual in the type; face very broad, finely and densely granular-punctate; mandibles black, apical part faintly reddish; flagellum red at apex, and slightly so beneath toward base; vertex with large punctures on a shining ground; hair of head and thorax long and loose, except the usual tomentum on postscutellum, tubercles, etc., and pale ochreous-tinted; mesothorax with strong punctures on a shining ground, smaller than those of vertex, but not conspicuously different; scutellum more densely punctured; postscutellum unarmed; basal area of metathorax irregularly subcancellate; tegulae dark brown with a pale margin, not enlarged; anterior wings about or nearly 9 mm. long, yellowish-hyaline, a little dusky apically; stigma and nervures light ferruginous; b. n. meeting t. m.; second s. m. broader than long, receiving first r. n. near the beginning of its last third; legs with abundant pale orange hair; apical part of hind basitarsus darkened; second joint of hind tarsus triangular; abdomen with the discs of the segments dullish, with only scattered piliferous punctures; hair-bands white, poorly developed, overlapped by long slightly yellowish hairs, band on second segment confined to sides; hair of apex fulvous; ventral segments with fringes of long yellowish hair, which collect pollen.

Habitat.—Nasik, Western India (*E. Comber*). British Museum. An *Andrena*-like species, structurally very close to *N. phenacura*, but separated by the black abdomen, the much more coarsely punctured mesothorax, etc.

Nomia oxybeloides Smith.

Mr. Comber took this at Sigiri (March, 1910), Salsette and Karachi. In the females the first r. n. meets the second t. c., the enlarged tegulæ are orange-fulvous, and the mesothorax has scattered very strong punctures on a shining ground. In the male the first r. n. joins the second s. m. near its end, the tegulæ vary to pale ochreous, and the mesothorax is finely, quite closely punctured. Nevertheless, they appear certainly to belong together, and Smith also had them associated; I have a male from F. Smith's collection, while the female has been compared with Smith's type by Mr. Meade-Waldo. *N. aliena* Cameron is evidently closely allied.

Nomia magretti enecta n. subsp.—Smaller, length 6 mm. or a little over. The female agrees with Gribodo's description of *magretti* except as follows; tegument of legs entirely dark, with at most faint brownish tints; the shining very sparsely punctured mesothorax practically nude, except for a narrow band of pale ochreous tomentum along anterior margin; vertical part of first abdominal segment scarcely hairy; hair on inner side of tarsi yellowish, but very pale. The male has the mesothorax much more closely punctured than the female; face covered with pure white hair; flagellum bright fulvo-ferruginous beneath; scutellum with a short spine at each posterior corner; hind femora only moderately thickened, but with a subapical hump above; underside of hind femora with long white hairs, spatulate at end; hind tibia pale yellow with a large black median patch, the flattened broadly rounded pale yellow apical lamella not very long, not nearly reaching middle of basitarsus; tarsi pale yellow, with the apical joint of anterior and middle pair, and all the small joints of hind pair, black; middle tarsi long, the last joint long-oval; hind margins of abdominal segments testaceous.

Habitat.—Karachi, N. W. India (*E. Comber*). One of each sex. British Museum. This is perhaps a distinct species, but it is so near to *N. magretti* that I describe it as a subspecies. *N. savignyi* Kohl is also allied, but considerably larger. Among the Indian species this is near to *N. oxybeloides*, differing in the smaller size, much smaller hind tibial lamella of male, cream-colored tegulæ of female, etc. The first r. n. meets the second t. c., or even enters the corner of the third s. m. The female is without the scutellar spines.

Nomia albolobata n. sp.—Length about or nearly $6\frac{1}{2}$ mm.; black, with rather abundant pale ochreous and white tomentum; head

broad, eyes strongly converging below; face densely covered with white hair, a little ochreous between antennæ; tongue very sharp but not long; vertex with pale ochreous hair; flagellum dull ferruginous beneath; thorax with hair pale ochreous above, white at sides and beneath; disc of mesothorax with the surface showing, closely punctured but shining; scutellum slightly bigibbous, shining, with irregular punctures; postscutellum densely tomentose, unarmed; area of metathorax reduced to a narrow channel crossed by little ridges; posterior face bare, shining, coarsely punctured, but there is a smooth triangle above, corresponding to the apical part of the basal area; tegulæ very large, closely punctured, creamy white with a dark brown basal patch; wings hyaline, stigma light ochreous, nervures darker; first r. n. meeting second t. c., or entering extreme basal corner of third s. m.; legs very dark brown, with white hair; anterior tibiæ ferruginous in front; anterior and middle tarsi pale yellowish, with the last joint black, the middle tarsi long and slender, with the black joint pear-shaped; hind femora moderately thickened, with a subapical hump or angle; hind tibiæ with a very large creamy-white lobe; hind basitarsus creamy-white, the other joints dark brown; abdominal segments coarsely punctured across the disc, the hind margins broadly smooth; the segments with much dense tomentum of a pale ochreous color, but the apical half of first segment bare except at sides, and the second to fourth segments with bare bands; fourth ventral bidentate in middle.

Habitat.—Hyderabad, N. W. India (*E. Comber*). There is some resemblance to *N. latispina* Cam. from Allahabad, but the hind femora are differently shaped, and there are various other differences. The difference in the shape of the hind femora also at once separates *N. albolobata* from *N. oxybeloides*; in the latter the femora are very thick, with the hump or angle near the middle.

Nomia flavolobata n. sp.—♂. Length about 10 mm.; similar to *N. albolobata*, but much larger, and differing also as follows: hair of face pure white throughout; antennæ entirely ferruginous, scutellum dullish, very densely punctured, with erect light brown hairs; sides of upper part of truncation of metathorax hairy; apical margin of first abdominal segment hairy right across; hind femora enormously swollen, triangular in lateral view, with the highest point a little beyond the middle; expanded lobe of hind tibiæ clear primrose yellow. In one specimen the metathorax and anterior and middle legs show much ferruginous. Compared with *N. savignyi* Kohl this species is so similar that on superficial examination they appear exactly the same. *N. savignyi* is readily separated, however, by the flattened shining (though

very coarsely punctured) scutellum, with a long sharp yellowish tooth or spine on each side; it also has the scape, and flagellum above more or less, infuscated; the tegulæ somewhat larger; the apical band on first abdominal segment confined to the sides (as in *N. albolobata*, but differently from *albolobata*, the depressed apical part is conspicuously finely punctured); and the genitalia are different. In *N. flavolobata* the lateral pieces, at the sides of apical ventral region of the abdomen, appear as large elongate ferruginous elevations; in *N. savignyi* the same place is occupied by small shining piceous tubercles.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum.

***Nomia savignyi* Kohl.**

This species, described from Aden, is to be added to the fauna of India, both sexes having been taken by Mr. Comber at Karachi, May and June, 1909. The female differs from the male in the usual manner; the scutellum is without the teeth; the femora are variably ferruginous.

I give a key for the separation of the Indian species with large tegulæ discussed above.

- | | |
|---|---------------------------|
| Males | 1. |
| Females | 5. |
| 1. Process of hind tibiæ small, not reaching middle of basitarsus;
small species | enecta Ckll. |
| Process of hind tibia large | 2. |
| 2. Larger species (about 10 mm.); process of hind tibiæ primrose
yellow..... | 3. |
| Smaller species; process of hind tibiæ white..... | 4. |
| 3. Scutellum with long spines..... | savignyi Kohl. |
| Scutellum unarmed | flavolobata Ckll. |
| 4. Hind femora much swollen..... | oxybeloides Smith. |
| Hind femora not greatly swollen..... | albolobata Ckll. |
| 5. Larger; mesothorax closely punctured..... | savignyi Kohl. |
| Smaller; mesothorax sparsely punctured | 6. |
| 6. Smaller; tegulæ cream-color with a dark basal spot.... | enecta Ckll. |
| Larger; tegulæ orange-fulvous..... | oxybeloides Smith. |

None of these have tegumentary abdominal bands.

***Nomia parcella* n. sp.**—♂. Length about $6\frac{1}{2}$ mm.; rather slender, with the appearance of male *Halictus subhirtus* Lep.; black, the hind margins of the abdominal segments suffusedly rufous; head broad; face densely covered with shining pale ochreous hair; vertex dull, closely and finely punctured, but area around middle ocellus shining; scape very dark brown; flagellum long and thick, pale dull ferrugin-

ous beneath, dusky above; mesothorax and scutellum shining, with fine punctures; hair of thorax dull, grayish or ochreous tinted, mostly thin and loose, but dense on tubercles and postscutellum; basal area of metathorax poorly defined, irregularly strigose; posterior face of metathorax shining, rounded at sides except below, where there are sharp edges; tegulæ pale reddish-testaceous, not enlarged; wings hyaline, faintly dusky, the large stigma and the nervures light rufo-testaceous; b. n. falling a little short of t. m.; second s. m. very narrow; receiving first r. n. before the middle; legs light rufo-testaceous, with long pale hair; anterior femora behind, and middle and hind femora except apically, as well as their coxæ, dark brown, but hind trochanters beneath conspicuously pallid rufous; abdomen shining, with exceedingly feeble and minute punctures; first segment seen from above a nearly equilateral triangle; dull white hair-bands at sides of first three segments, and entire on fourth and fifth, and on the apical half scattered pale hair; venter shining, but a large patch occupying the greater part of disc of fourth segment depressed and dull; fifth ventral with a shallow median pit. Legs not modified.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum. This has some resemblance to *N. parca* Kohl, but differs in the color of the legs. The hind tibiæ of *parcella* are very slender basally, gradually narrowing to a broad apex, without the subapical inner projection seen in *parca*.

Nomia halictura n. sp.—♀. Length about 9 mm. or a little over, anterior wing 7, black, the abdomen with a brownish tint; head broad, eyes converging below; face and cheeks with rather thin grayish pubescence; tongue slender but not long; front striate in middle, smoother and shining at sides; antennæ dark, the flagellum ferruginous apically; thorax with grayish pubescence, a little ochreous above dense on tubercles, upper border of prothorax and postscutellum; mesothorax very closely punctured; scutellum more shining, the discal punctures more separated; area of metathorax triangular, poorly defined apically, the basal part strongly and closely striate; posterior truncation with a sharp lateral edge only below; tegulæ not enlarged, reddish clouded with fuscous; wings strongly infuscated; stigma rather dark reddish, nervures yellowish; second s. m. about as broad as long, receiving first r. n. in middle; legs black with coarse pale hair, light yellowish on inner side of tarsi; outer side of hind tibiæ with fuscous hair intermixed; abdomen broad in middle narrowed basally, the first segment forming a nearly equilateral triangle; segments without punctures, their hind margins rufo-testaceous; first two segments with pale ochreous hair-bands at sides only, but on the third and fourth they are entire; there is also much long loose hair. Marginal cell obtuse at apex, as usual in *Nomia*.

Habitat.—Nasik, Western India (*E. Comber*, 23). British Museum. Very near to *N. parcella*, but evidently not its female, from the much larger size, darker wings, and much broader second s. m., as well as the darker tegulæ, and dull, more coarsely punctured mesothorax. It looks exactly like an *Halictus*. The Australian *N. halictella* Ckl. is very similar, but has the base of the abdomen much broader.

Nomia nursei semifortis n. subsp.—♂. Agrees with Cameron's description of *N. nursei* except as follows: flagellum broadly light yellowish beneath, above broadly black; cross-ridges of metathoracic enclosure practically uniform; posterior face of metathorax shining, rugose with a linear median sulcus; abdominal hair-bands light ochreous (not gray); hind tibiæ with a large rufous patch on outer side. Also very near to *N. fervida* Smith, but distinguished by the leg-characters mentioned by Cameron for *nursei*, and also by the shining vertex, with large punctures.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum. This may be no more than an individual variation of *N. nursei*, but it probably represents a distinct race. From *N. aureohirta* Cam. it is easily known by its smaller size, the densely punctured surface of mesothorax and scutellum not hidden by tomentum, and the coarsely punctured apical half of the first three abdominal segments.

Nomia virgata n. sp.—♀. Length about 9 mm.; black, with grayish-white pubescence, which forms broad dense bands on the hind margins of the abdominal segments, interrupted in the middle on the second, and confined to the sides on the first; the hind margins of the segments also have the tegument pale testaceous; head broad; face with grayish-white hair, denser at sides; lower edge of clypeus with pale golden hairs; clypeus closely punctured, the punctures larger on lower part; front closely and coarsely punctured; vertex narrow, well punctured; scape long; flagellum short, ferruginous beneath; mesothorax and scutellum very closely punctured, the punctures much smaller than those on front; broad upper surface of prothorax, tubercles, postscutellum, posterior margin of mesothorax broadly, and a line along anterior border of scutellum, covered with felt-like tomentum; area of metathorax with feeble ridges, the apical triangle cut off by a sharp transverse ridge; tegulæ pale testaceous in front, dark rufous behind; wings dusky, the comparatively small stigma and the nervures dull testaceous; marginal cell very obtuse at end; second s. m. broader than long, receiving first r. n. near its end; b. n. arched only

at lower end; legs black with light hair, anterior and middle knees red; hair on outer side of hind legs glittering silvery; hind basitarsus broad; abdomen very broad at base; first segment evidently punctured, second more feebly so, the others hardly at all; apical plate broadly rounded at end; venter with silvery hair. Clypeus not keeled.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum. In Bingham's table of Indian *Nomia* this could run near *N. rustica* or *N. aurata*. *Nomia rustica* Westwood, described from the male, is perhaps allied, but has dark brown nervures and some other differences probably not due to sex. *N. aurata* Bingh. has rufo-testaceous legs and many other distinctive characters. Superficially *N. virgata* resembles some species of *Andrena*, as *A. simulata* Prov. = *canadensis* D. T.

Nomia andrenina n. sp.—♀. Length about 10 mm., rather robust, resembling an *Andrena*; black, with very pale ochreous pubescence, that on face grayish, rather dense, the same from side to side; mandibles black; clypeus and face minutely granular, the clypeus not keeled; flagellum short, obscure reddish beneath; distinctly red at apex; front dull and granular, but vertex shining, with large separate punctures; mesothorax and scutellum densely and very finely punctured; upper border of prothorax, tubercles, postscutellum and posterior margin of mesothorax densely tomentose; metathorax hairy, except the narrow basal area, which is finely cross-striate; tegulae pale testaceous, dark basally; wings dusky, nervures and stigma yellowish-testaceous; marginal cell very obtuse at end; second s. m. broader than long, the first r. n. joining it about the beginning of its last third; b. n. strongly arched at lower end, meeting t. m.; coxae, trochanters and femora very dark brown, the knees a little reddish; anterior tibiae dark, reddish at apex; middle tibia red at base and broadly so at apex; hind tibiae entirely red; tarsi ferruginous, hind basitarsus with a large dark patch on apical half; hair of legs pale golden; abdomen broad, dullish, not punctured, hind margins of segments broadly rufo-testaceous; base broad; apices of segments with very broad bands of pale ochreous tomentum, reduced to lateral patches on segments 1 and 2, entire on 3 and 4; apex with bright rufofulvous hair.

Habitat.—Type from Karachi, N. W. India (*E. Comber*). British Museum. Another one was taken by Mr. Comber at "Shpali," an abbreviation of the name of some place near Karachi. Very close to *N. aureohirta* Cam., but the latter has the clypeus more strongly punctured, the hair of the sides of the face much more dense than on clypeus, the

stigma smaller, the first r. n. joining second s. m. about the middle, the truncation of metathorax broader, and the legs with more red. There is also some resemblance to *N. phenacopsis* Ckll., but that species is larger, and has large strong punctures on the mesothorax, the surface between the punctures shining.

Nomia ardjuna n. sp.—♀. Length about 9 mm.; black, including legs; head, thorax and legs with dense white hair, but this is absent from posterior face of metathorax, while the mesothorax, scutellum and postscutellum are densely covered with short orange-fulvous pubescence; sculpture of face hidden by pubescence; vertex dull, without distinct punctures, shining between the ocelli; scape long, black; flagellum short but rather slender, ferruginous at base and apex beneath; base of metathorax with a narrow transversely striate groove, the striæ oblique; truncation with a large dagger-shaped median depression; tegulæ pale testaceous, the basal half covered with hair; wings dusky hyaline, the small stigma and the nervures piceous; second s. m. small but not narrow, receiving first r. n. a little beyond middle; tongue very sharp, but short; hair on inner side of hind tarsi reddish-gray; abdomen rather shining, with scattered small punctures; hind margins of the first four segments pale reddish testaceous, covered with very broad bands of dense pale ochreous tomentum, that on first very broadly interrupted, or only nearly so; no bright colored hair at apex.

Habitat.—Type from Karachi, N. W. India (*E. Comber*), British Museum. Also taken by Mr. Comber at "Shpali." Resembles *N. scutellata* Smith, but hair of face entirely white, nervures dark (testaceous in *scutellata*), etc. Also to be compared with *N. albofimbriata* Cam., but that has narrow abdominal hair-bands, testaceous stigma, etc.

Nomia ustula n. sp.—♂. Length about $8\frac{1}{2}$ mm.; black; the mesothorax and scutellum covered with very short fulvous hair; on the mesothorax rather thin, so that the very finely, closely and minutely punctured surface is visible; on the scutellum very dense and very bright colored. Mandibles pale reddish in middle; eyes very strongly converging below; face densely covered with shining very pale yellowish hair; front and vertex finely granular, with thin fulvous hair; scape covered with long fulvous hair; third antennal joint somewhat enlarged, bright orange-fulvous beneath except at base; flagellum broadly black above, ferruginous beneath; pleura, tubercles and upper edge of prothorax with white or almost white hair, postscutellum with light fulvous tomentum; area of metathorax dullish, without evident sculpture,

the triangular apical part not separated from the base; tegulae ferruginous, dark at base; wings dusky, the nervures and rather small stigma dull sepia; b. n. arched; second s. m. narrow, receiving first r. n. a little beyond middle; legs black, with grayish-white hair, anterior and middle knees reddish; hind trochanters with a prominent sharp tooth; hind femora only moderately swollen; hind tibiae broad, with a chestnut-colored apical lobe, only reaching to about the middle of the adjacent spur; hind tarsi long; abdomen shining, evidently punctured, the first segment smoother; first segment with much erect pale ochreous hair; first four segments with rather narrow, not dense, apical hair-bands, ochreous tinted in middle, dull white at sides; fourth ventral segment with a strong median keel.

♀. Similar, except for the usual sexual differences; clypeus granular, not keeled; sides of face with grayish-white hair; front dull, vertex shining; hair on inner side of hind basitarsus pale yellowish; sides of apex of abdomen with some fuscous hair.

Habitat.—Type (male) from Kandy, Ceylon, Feb., 1910 (*E. Comber*). British Museum. Female from Dambulla, Ceylon, March, 1910 (*E. Comber*). Resembles *N. ardjuna*, but rather smaller, with the inner upper orbital margins (female) more concave, the base of metathorax without sculpture, etc.

Nomia perlucida n. sp.—♂. Length about 10 mm., anterior wing 7; shining black, with white hair, grayish on head and thorax above; mandibles black; eyes only moderately converging below; face densely covered with white hair; scape short, black; flagellum long, dull ferruginous, a little dusky above, the last joint dusky, thick, obliquely truncate; vertex shining, with very fine punctures; mesothorax and scutellum shining, with distinctly separated strong punctures; postscutellum densely covered with white tomentum; scutellum slightly bilobed, not toothed; metathorax with a broad basal feebly sculptured channel; apical truncation shining, sparsely punctured, with a median short groove; tegulae pale testaceous, not enlarged; wings hyaline, with a smoky apical cloud; stigma and nervures sepia; b. n. meeting t. m.; second s. m. broader than long, receiving first r. n. at or just beyond the middle; legs very dark reddish brown, with white hair; hind trochanters with a tubercle beneath; hind femora hairy, moderately incrassate; hind tibiae with a dark pointed apical lobe not as long as the spurs; hind basitarsus obtusely angulate posteriorly near the middle; abdomen shining, irregularly punctured, the punctures on first segment large and strong; hind margins of segments with dense, rather broad, bands of white tomentum; fourth ventral segment with a triangular smooth median area; abdomen ending in a broadly rounded ferruginous plate.

♀. Similar, except for the usual sexual differences; clypeus densely granular punctate, not keeled; flagellum ferruginous beneath; hair on inner side of hind tarsi very pale yellowish.

Habitat.—Type from Karachi, N. W. India (*E. Comber* 83; male, marked by the collector "probably new"). British Museum. Females collected by Mr. Comber at Karachi and Malir. In Bingham's table this runs to *N. rustica*, which differs in the venation, structure of the abdomen, etc. The lower side of the male hind femora is practically flat, not at all concave.

The following key separates the Indian species described above, in which the tegulæ are not enlarged, and the abdomen is not partly red, except sometimes the reddish hind margins of the segments.

- | | |
|---|--------------------------------|
| Males | 1. |
| Females (none very small) | 6. |
| 1. Very small (length about 6½ mm.), hind legs not noticeably modified | parcella Ckll. |
| Much larger | 2. |
| 2. Hind legs without yellow (a pale tibial lobe in <i>thoracica</i>) | 3. |
| Hind legs with much bright yellow | 5. |
| 3. No rufous hair on thorax | perlucida Ckll. |
| Scutellum covered with rufous tomentum | 4. |
| 4. Much larger; wings strongly reddish; postscutellum with white hair, contrasting with that of scutellum | thoracica Smith |
| Much smaller; wings not reddish; hair of postscutellum ochreous. | ustula Ckll. |
| 5. Larger; hind femora red and yellow | aureohirta Cam. |
| Smaller; hind femora black and yellow. | nursei semifortis Ckll. |
| 6. At least the hind tibiæ and tarsi clear ferruginous | 7. |
| Hind tibiæ and tarsi not ferruginous | 9. |
| 7. Sides of face glittering, more densely pubescent than clypeus. | aureohirta Cam. |
| Clypeus and sides of face with pubescence the same | 8. |
| 8. Mesothorax with large punctures on a shining ground. | phenacopsis Ckll. |
| Mesothorax with very small dense punctures | andrenina Ckll |
| 9. Scutellum shining, with irregular punctures, large and small. | perlucida Ckll. |
| Scutellum finely punctured, or covered with tomentum | 10. |
| 10. Mesothorax and scutellum densely covered with orange-fulvous tomentum | ardjuna Ckll. |

Scutellum densely covered with ferruginous tomentum, but mesothorax much less densely tomentose, except posteriorly.

ustula Ckll.

Scutellum not densely covered with tomentum.....11.

11. First abdominal segment, seen from above, a nearly equilateral triangle.....**halictura** Ckll

First abdominal segment very broad, not at all triangular.

virgata Ckll.

Colletes comberi n. sp.—♀. Length about 8 mm.; anterior wing about 6; black, with white pubescence, neither ochreous nor mixed with dark on thorax above; malar space about a fourth broader than long, striate basally; clypeus prominent, shining, with scattered punctures, middle depressed, lower margin distinctly emarginate; supraclypeal area shining, punctured at sides; sides of face and cheeks densely covered with long pure white hair; vertex with extremely fine punctures; labrum smooth and shining, without a pit in the type specimen, with a central pit in the other; scape and base of flagellum black, rest of flagellum broadly light ferruginous beneath, blackish above; thorax with much white hair; mesothorax and scutellum shining, with sparse small punctures, disc of scutellum impunctate; base of metathorax with quadrangular areas separated by fine ridges; truncation with long hair; tegulae hyaline, tinged with testaceous; wings clear hyaline, stigma clear ferruginous or amber-color, nervures ferruginous the outer ones rather dusky; second s. m. very large, broader than third, receiving first r. n. a little beyond middle; legs black, with white hair, tarsi red at apex; hair on inner side of hind basitarsus white, yellowish at tip; hind spur apparently simple, the minute denticulations only visible with a high power of the microscope; abdomen with extremely fine punctures; hind margins of segments reddish, but in good specimens covered with short white hair; first two segments with the base broadly covered with white hair, leaving only a narrow discal band showing the surface; on the third and fourth segments the basal white hair is not so prominent, and on the fifth it is absent, though the whole segment is thinly pilose; the apical segment has appressed yellowish-tinted hair; last ventral sparsely punctured. Last joint of maxillary palpi a little longer than fifth. Measurements of antennal joints in microns: (2.) 160, (3.) 176, (4.) 145, (5.) 160, (6.) 176.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum. This does not resemble any described Indian species. It may be compared with *C. mixtus* Rads., from which it differs by white abdominal bands, not tinged with yellowish, and the light brightly colored stigma. A very similar (undescribed) species occurs at Alamosa, Colorado.

***Osmia integra* Cresson.**

♂. Campus of University of New Mexico, Albuquerque, at flowers of *Astragalus*, April 19 and 26 (*J. R. Watson*). New to New Mexico.

***Osmia watsoni* n. sp.**—♂. Length about 10 mm., general aspect of *O. latreillei* Spin., but very distinct by the peculiar antennæ. Head and thorax yellowish-green, but sides of thorax, and sometimes front and vertex bluish or blue-green, scutellum with brassy tints; abdomen yellowish-green, varying to blue-green, hind margins of segments colorous; legs black, the hind femora in front very faintly metallic; hair of face dense and white, of head and thorax above long and pale ochreous; of abdomen pale ochreous, thin, not forming evident bands; mandibles shining, with a long apical tooth, and a variably crenulate or subdentate inner cutting margin; eyes reddish-brown in the type, in the other specimen green; scape and second antennal joint black; flagellum clear light ferruginous above and below, strongly crenulated behind, but with the last joint flattened, more or less discoid, shining black; tarsi ferruginous apically; middle tarsi normal except that the basitarsus is somewhat thickened; hind basitarsus conspicuously broadened and flattened toward end; nervures and stigma dark, more or less reddish; sixth abdominal segment with a large notch in type, a very small one in the other specimen; seventh segment narrowed apically, with two very strong parallel teeth; venter with no unusual features.

Habitat.—Campus of University of New Mexico, Albuquerque, at flowers of *Astragalus*, April 8 (type) and 18 (*J. R. Watson*). Very easily known by the unique antennæ.

***Dioxys phaceliæ* n. sp.**—♀. Length about 8½ mm.; black, eyes dark plumbeous; tarsi, apices of tibiæ, and hind tibiæ suffusedly behind, dark red; hind spurs red; hair of head and thorax pale ochreous, darker and redder on face; hind margins of abdominal segments with narrow reddish-brown hair-bands; head, thorax and abdomen coarsely and densely punctured; tegulæ piceous; wings dilute fuscous, slightly violaceous; postscutellar spine slender; apical segment of abdomen broad, triangular, with the sides in outline gently convex, and the apex obtuse; venter strongly punctured.

Habitat.—Albuquerque, New Mexico, at flowers of *Phacelia corrugata* A. Nelson, April (*J. R. Watson*). Readily known from other American species by the shape of the last abdominal segment and the reddish abdominal bands.

***Andrena comberiana* n. sp.**—♀. Length 9 mm. or a little less; head, thorax and legs black, the small joints of the tarsi ferruginous;

first two abdominal segments, apex and base of third, and a small basal mark on each side of fourth, clear orange-ferruginous, but the first segment with a dark mark on each side near the base, and the second with an oval black spot on each side; pubescence white, faintly yellowish on head and thorax above, white with a slight creamy tint at apex of abdomen; facial quadrangle a little broader than long; process of labrum very broad, truncate; malar space linear; clypeus shining, sparsely punctured; front dull; facial foveæ pale, close to eye, not extending below antennæ, their width about half distance between eye and antennæ; antennæ black, the last seven joints broadly bright ferruginous beneath; third joint perhaps a trifle longer than next two combined; mesothorax and scutellum shining, with sparse very small punctures; metathorax dull, the merely granular area scarcely defined; tegulæ pale testaceous; wings hyaline, very faintly brownish, nervures and stigma sepia, the latter pallid centrally; second s. m. broad, receiving first r. n. near its end; abdomen shining, with excessively minute punctures, thin white apical hair bands on segments 2 to 5, very thin on second.

♂. Length about 8 mm., more slender; clypeus white with two black spots; antennæ short for a male, last eight joints broadly light yellowish-ferruginous beneath; base of flagellum beneath very black; face with much white hair; abdomen black; with the apical margins of the first three segments, and the lateral bases of second and third, red.

Habitat.—Karachi, N. W. India (*E. Comber*). British Museum. The type is a male. In Schmiedeknecht's table of European species, this runs in both sexes nearest to *A. ventralis*, but is readily separated by the shorter antennæ of the males and other characters. In the scarcely defined area of metathorax it resembles *A. arima* Cam. from Simla. The general appearance of the female recalls *A. marginata* Fabr., but there is no close affinity.

***Xylocopa auripennis* Lep.**

Island of Hainan, March, 1909 (*H. Schoede*). Berlin Museum.

***X. bryorum* Fabr.**

Cairns, Queensland (*Froggatt*).

***X. collaris binghami* Ckll.**

Island of Hainan, March, 1909 (*H. Schoede*). Berlin Museum.

***X. orichalcea* Lep.**

Formosa (*Sauter*). Berlin Museum. The localities are

Pilam and Kagi. One in the U. S. National Museum is from Horisha, Formosa (*T. Fukai*).

X. sauteri Friese.

Formosa (*Sauter*). Berlin Museum. The localities are Teraso (April), Chikutoge (May) and Pilam (February).

X. sauteri var. **nigrescens** Friese.

Formosa (*Sauter*). Berlin Museum. The specimens are from Teraso (April), Taihanroku (August), Kaukau (April), and Fuhosho (April). A remarkable scarlet-red beetle, with very large mandibles, was found in the nest of this bee in a tree. I sent a drawing of it to the British Museum, and Mr. Gahan informs me that it is a *Cissites*, probably *C. maxillosa* Fabr.

X. ruficeps Friese.

Formosa (*Sauter*). Berlin Museum. The locality is Taihanroku, August, 1908. The male has the head much smaller than that of the female; it resembles *X. rufescens*, but differs in the head. The female is not at all like *X. rufescens*.

THYGATINA n. g. (*Anthophoridae*).

Related to the Neotropical genus *Thygater* Holmberg, but with the second submarginal cell receiving the first recurrent nervure at the end of the the third fifth or second third, the lower side obtusely angled at the junction, so that the cell is pentagonal; female with clypeus wholly without a keel, and third antennal joint shorter than in *Thygater*, being about as long as the next two united. Maxillary palpi 3-jointed; first joint stout, brown; the other two slender, pale ferruginous, the third much longer than the second (in type species third joint is about 145 microns long). Labial palpi with first joint about twice as long as second, the two apical joints very minute.

Thygatina fumida n. sp.—♀. Length about $12\frac{1}{2}$ mm., width of abdomen a little over $4\frac{1}{2}$; robust, black, but the labrum slightly reddish, especially at base, the mandibles with a broad orange-fulvous stripe (but no basal spot), and the tegulae ferruginous with a dark patch anteriorly; head broad, eyes parallel, facial quadrangle a little broader than long; mandibles notched at extreme apex; labrum covered with coarse pale ochreous hair; clypeus dull, with dense elon-

gate punctures; hair of head dull white, strongly mixed with black in supraclypeal region, and nearly all black on front and vertex, though pale on occiput and cheeks; scape short; antennæ black, the last joint slightly reddish; hair of thorax soot-color, conspicuously plumose; mesothorax strongly punctured, dull, the anterior middle shining; area of metathorax dull, but lower part of truncation shining, with a deep median pit; wings strongly infuscated, nervures piceous; b. n. falling a very little short of t. m.; third s. m. rather short; legs black, the hind femora, hind tibiæ behind, and middle femora more or less ferruginous; spurs light ferruginous; hair of anterior and middle femora and tibiæ mainly grayish, but of hind tibiæ longer and black or blackish, of all the tarsi black on outer side and red on inner; scopa of hind legs long and loose, plumose; abdomen very finely punctured, the hind margins of the first two segments broadly suffused with reddish; abdomen with black hair, very short and thin above, long beneath, and dorsally with much pale hair on basal declivity of first segment, a very inconspicuous narrow band of pale tomentum at base of second, and obscure median narrow bands on third and fourth; apex with fuliginous hair; apical plate transversely striated (as in *Thygater*).

Habitat.—Kandy, Ceylon, February 10, 2 ♀ (*E. Comber*). British Museum. A very surprising discovery.

***Anthophora porterae* Ckll.**

♀. Campus of University of New Mexico, Albuquerque, at flowers of cherry, April 18 (*J. R. Watson*).

***Anthophora porterae* var. *watsoni* n. var.**

♂. Hair of thorax above pale, with a yellowish tint, and without any intermixture of black. I had at first taken this for a distinct species, but in size, form of legs, pubescence, face-markings, etc., it agrees exactly with *porterae*. The last joint of the middle tarsus has long black hair on each side. Albuquerque, New Mexico, at flowers of *Phacelia corrugata* A. Nelson (*J. R. Watson*).

***Anthophora lesquerellæ* (Ckll.).**

♂. Campus of University of New Mexico, Albuquerque, at flowers of *Astragalus* (*J. R. Watson*).

***Tetralonia lycii* (Ckll.).**

♂. Albuquerque, New Mexico, at flowers of *Astragalus*, April 10 (*J. R. Watson*).

***Tetralonia phaceliæ* n. sp.**—♀. Length about 13 mm., general build and appearance of *T. annæ*, hind spur not hooked. Hair of

head and thorax very pale grayish, delicately ochreous-tinted on thoracic dorsum; facial quadrangle about as broad as long; eyes pale bluish-green; clypeus shining, with very large more or less confluent punctures, and a broad shining median ridge; antennæ black; mesothorax coarsely punctured, but shining between the punctures; tegulæ black in front, ferruginous behind; legs black, with pale grayish hair, ferruginous on inner side of hind basitarsi; wings grayish; abdomen rather narrow for the genus, black, with very broad bands of grayish-white tomentum; the second segment is covered with this tomentum except the bare apical margin, and the extreme base, which has black velvety tomentum, broadening a little at sides; the third and fourth segments have the bands broad and even, with about the basal two-fifths of third and one-half of fourth covered with black velvety tomentum; the fifth segment has the broad fringe white, stained with chocolate in the middle; the apical has the hair strongly stained with chocolate; apical plate rather broad.

Habitat.—Albuquerque, New Mexico, at flowers of *Phacelia corrugata* A. Nelson, April 29 (*J. R. Watson*). Known from *T. annæ* Ckll. by the creamy-white (not ferruginous) hair on outer side of hind tibiæ and tarsi, the strong median ridge on clypeus, and the denser and whiter abdominal bands, those on third and fourth segments without overlapping long black hairs. From *T. beltragei* (Cress.) it is easily known by the very broad bands, especially that on second segment. From *T. douglasiana* Ckll. it is known by the black at extreme base of second abdominal segment and the ridge on the clypeus.

***Melissodes atrifera sandiarum* Ckll.**

A male collected by Professor Watson at flowers of *Croton*, Sandia Mts., New Mexico, July 26, differs from the type in having a light yellow band across the lower part of the clypeut, reminding one of *M. hexacantha* Ckll. (which has much shorter antennæ) and *M. confusiformis* Ckll. (which has much darker antennæ).

***Ceratina sexmaculata* Smith.**

Smith correctly associated the sexes, but Bingham described and figured the male of *sexmaculata* as a female, and probably confused the true females with *C. binghami*. *C. binghami* is a distinct species, the male having no black patches on the abdomen. From the British Museum I have

the following *sexmaculata* out of the Comber collection : male, Karachi, N. W. India, Sept. 1909 ; females, Karachi, Nasik and Sigiri. In the Sauter collection from Formosa, received from the Berlin Museum, *C. sexmaculata* is represented from Takao (June, July, September, October, November, December), Kagi (August) and Koroton (September).

CERATINA subg. **CERATINIDIA.**

There are two very closely allied species of *Ceratinidia* in Formosa, separable as follows in the female :

Rather larger (sometimes over 10 mm.) ; vertical yellow bar on clypeus very broad ; sides of mesothorax in front shining, with well separated punctures.....**hieroglyphica** Smith.

Rather smaller ; vertical bar of clypeus rather narrow ; sides of mesothorax in front (in both sexes) dullish, minutely rugoso-punctate**morawitzii** Sickmann.

C. hieroglyphica Sm.

All the Formosan specimens (Sauter collection, Berlin Museum) are females. They are from Kagi (August 26), Koroton (September 8), Kanshirei (June 8), and Taihanroku (June 11).

C. morawitzii Sickm.

The Sauter collection contains 16 ♀, 9 ♂ from Takao (June, July, August, September, October, December) and a male from Gyamma (June 4). From Taihanroku, June 11, is a single specimen of a variety of the female, having the upright band on the clypeus reduced to a small projection, broader than long.

Apis dorsata Fabr.

Island of Hainan, March, 1909 (*H. Schoede*). Berlin Museum. This is the same as the Ceylon form.

Apis indica peroni (Latr.).

Twenty workers from Formosa (*Sauter*), the localities being Takao, Taihanroku, Pilan, and Lake Candidius. The series is very variable. One comes from the Island of Hainan, March, 1909 (*H. Schoede*).

Apis florea sumatrana Enderlein.

Dambulla, Ceylon, March, 1910, one worker (*E. Comber*). British Museum. This form was described from Sumatra ;

it lacks all red color on the abdomen, except that, at least in the Ceylon specimen, the hind margins of the segments are very narrowly reddish. The form *andreniformis* Smith is almost the same, but has the base of the second abdominal segment slightly rufopiceous. A specimen of *andreniformis* from the Khasia Hills (*Sladen*) has the hair on the metathorax very light yellowish, whereas in the Ceylon *sumatrana* it is white. In the Ceylon specimen the hair fringing the hind margins of the hind tibia and basitarsus is white, whereas in the Khasia Hills *andreniformis* and a *florea* from Calcutta (*Sladen*) it is black.

Apis florea nasicana subsp. nov.

Worker. First two abdominal segments and base of third bright ferruginous, rest of abdomen black, without evident basal hair-bands; hair fringing hind tibia and basitarsus behind, and the tibia in front, pure white; scutellum entirely black; hair of metathorax white; marginal cell with no appendicular nervure; stigma ferruginous.

Habitat.—Nasik, Western India (*E. Comber*). British Museum. This is evidently different from the form found at Calcutta, which I take to be genuine *A. florea*.

