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Ezra Townsend Cresson

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On the North American species of the genus OSMIA.

BY E. T. CRESSON.

Genus OSMIA, Latr.

"The *labial palpi* four-jointed, the basal joint elongate, the second nearly twice as long, the third and fourth minute, the third inserted at the apex of the second, the fourth at the apex of the third, the two latter clavate, truncate at their apex. The *maxillary palpi* four-jointed, the basal joint stoutest, broadest at the base, about the same length as the second and third joints, the apical joint minute. The *superior wings* with one marginal and two submarginal cells, the second submarginal cell receiving the two recurrent nervures.

"In the female the head is usually very large, subquadrate, the ocelli placed forward on the vertex in a slight curve; the abdomen furnished with a dense pollen-brush beneath.

"Males usually resembling the female, but more slender, having the antennæ longer, and the apex of their abdomen generally armed with spines or teeth."—Smith, *Bees of Great Britain*, p. 157.

The bees of this interesting genus are generally of a bluish or greenish color, having a short, robust form, more or less pilose, the head large, especially in the females, and the abdomen mostly subglobose. A very interesting account of the economy of these bees is given by Mr. Smith (*ibid.* pp. 158—162).

In this paper I have 33 North American species to record, all of which are known to me except two—*O. frigida* Smith, and *O. bucconis* Say. In separating the closely allied species, I have relied much on the difference of sculpture and punctation, which seems to be very constant in the same species, although when more material has been accumulated, we may find intermediate grades of variation that will make varieties of some that are now considered distinct species.

1. *O. bucephala*, n. sp.

Female.—Head very broad, subquadrate, as large as the thorax, black with a slight bluish-green reflection, densely and finely punctured, clothed with rather long pubescence, which is black on the clypeus, dense and ochraceous about the insertion of the antennæ, sparse on the vertex, and dense and fuscous on the cheeks beneath; apical margin of the clypeus suddenly, strongly and squarely produced in the middle, and fringed beneath with a short fulvous pubescence, the lateral angles of this projection are obtuse but prominent; on each side of the clypeus immediately above the base of the mandibles a

small shining tubercle; mandibles very stout, rugose and clothed with short fuscous pubescence, their apex broad, armed with three short teeth, the innermost one blunt, and the two outer ones approximate and subacute; lower margin of each mandible with a deep longitudinal channel, and a large irregular tubercle at the base immediately below each extreme lateral angle of the clypeus; inner orbits of the eyes acutely carinated; antennæ about the length of the head, black. Thorax black, finely and very closely punctured; densely clothed with rather long pubescence which is ochraceous above and on the sides, and fuscous beneath; tegulæ black, shining and feebly punctured. Wings fusco-hyaline, apical margin paler; nervures blackish. Legs black, clothed with black or fuscous pubescence. Abdomen subglobose, black with a greenish-blue reflection, minutely punctured, polished; basal segment above thickly clothed with rather long ochraceous pubescence; the second segment with dark fuscous pubescence intermixed with ochraceous on the anterior part; third, fourth and fifth segments with short black pubescence; apical segment clothed with very short ochraceous pubescence; beneath the ventral scopa is dense and black. Length $7\frac{1}{2}$ lines.

Hab.—Great Slave Lake, British America. One specimen. Coll. Smithsonian Institution.

This and the next species are at once distinguished from all others known to me, by the large size, robust form and the unusually large head. Both species closely resemble each other, but are sufficiently distinct by the characters given in the descriptions.

2. *O. megacephala*, n. sp.

Female.—Head very broad, subquadrate, rather larger than the thorax, black with a slight bluish reflection, densely and somewhat strongly punctured, clothed with rather long black pubescence, except a tuft above the insertion of each antenna which is ochraceous, the pubescence dense on the face and clypeus and sparse on the vertex; clypeus and mandibles as in the preceding species; inner orbits of the eyes acutely carinated; antennæ about the length of the head, black. Thorax closely and somewhat strongly punctured, black, densely clothed with rather long ochraceous pubescence, with a slight mixture of black on the disk above; metathorax opaque blue-black, very minutely punctured, with a deep impression on its disk; tegulæ black, shining, feebly

punctured. Wings subhyaline, apical margins clouded; nervures black. Legs black, with black hairs; tarsi beneath clothed with fuscous pubescence. Abdomen subglobose, black, with a very slight bluish reflection, polished, minutely punctured; the pubescence colored above and beneath as in the preceding species. Length $7\frac{1}{4}$ lines.

Hab.—Rocky Mountains, Colorado Territory. One specimen. Coll. Entom. Soc. Philadelphia.

Closely resembles the preceding species, but differs by the stronger punctation of the head and thorax, by the less robust form and by the different color of the wings. The head in this species is rather larger than the thorax, whereas in *bucephala* the head and thorax are about equal in size.

3. *O. longula*, n. sp.

Female.—Head subtransverse, black slightly tinged with deep blue in certain lights, subopaque, very densely, closely, and uniformly punctured; face and clypeus with a sparse black pubescence, that on the vertex ochraceous, and on the cheeks beneath long and fuscous; clypeus slightly prominent, with the apical margin subemarginate; mandibles rather deeply channelled near the outer margin, apex armed with three teeth, the two innermost ones short and blunt, the outer tooth longer and subacute; antennæ longer than the head, black. Thorax black, with a greenish reflection posteriorly, subopaque, very densely, finely and closely punctured, clothed above with long ochraceous pubescence; tegulæ piceous, minutely punctured. Wings subhyaline; nervures fuscous. Legs black, with black pubescence, tarsi with fuscous pubescence. Abdomen subglobose, broader posteriorly, black with a greenish-blue reflection, polished, finely punctured; basal segment above clothed with ochraceous pubescence, remaining segments with short black pubescence; beneath the ventral scopa is dense and black. Length 7 lines.

Hab.—Rocky Mountains, Colorado Territory. One specimen. Coll. Entom. Soc. Philadelphia.

4. *O. juxta*, n. sp.

Female.—Head subtransverse, as wide as the thorax, black, with a deep blue reflection, densely and rather strongly punctured, face and vertex clothed with fuscous pubescence intermixed with ochraceous about the base of the antennæ and on the vertex; apical margin of the

clypeus truncate; mandibles stout, lower margin channelled, apex broad and armed with three teeth, the innermost one being short and bifid, and the others long and subacute; antennæ short, black. Thorax black, tinged with greenish posteriorly, opaque, very densely and finely punctured, clothed above with long ochraceous pubescence, beneath with fuscous pubescence; tegulæ black, finely punctured. Wings subhyaline; nervures blackish. Legs black, clothed with short fuscous pubescence. Abdomen subglobose, finely and rather densely punctured, polished, black with a bright bluish reflection changing to green towards the tip; basal segment thinly clothed above with ochraceous pubescence, remaining segments with a very short scattering black pubescence; beneath, the ventral scopa is dense and black. Length 6 lines.

Hab.—Rocky Mountains, Colorado Territory. One specimen. Coll. Entom. Soc. Philadelphia.

Closely allied to *O. longula*, but rather smaller, the head longer and broader, the clypeus truncate in front, and the mandibles larger, with their teeth differently shaped, the antennæ shorter, the second submarginal cell not so broad, and the abdomen not so robust as in that species.

5. *O. latitarsis*, n. sp.

Male.—Head dark blue-green, densely and finely punctured, clothed with long whitish pubescence which is rather thin on the vertex and cheeks and very dense on the face; mandibles black, shining, deeply bifid at tip, the inner tooth short, broad and truncate, the outer one rather long and acute; antennæ black, as long as the head and thorax. Thorax dark blue-green, densely and finely punctured, clothed with long dense whitish pubescence; tegulæ black, shining. Wings subhyaline, apical margins faintly clouded; nervures blackish. Legs black, clothed, especially the femora beneath, with rather long whitish pubescence; tarsi beneath with fuscous pubescence; the second, third and fourth joints of the intermediate tarsi subtriangular and broadly dilated; the innermost spur of the posterior tibiæ slightly incurved at tip, very long and about twice the length of the other; basal joint of the posterior tarsi rather long, clavate, broadest at tip; apical joints of all the tarsi piceous. Abdomen broadest posteriorly, incurved at tip, black, with a blue-green reflection, shining, very densely and finely punctured, apical

margin of the segments above smooth and shining; the two basal segments above clothed with whitish pubescence, that on the basal segment longest; the third, fourth and fifth segments clothed with black pubescence; apical margin of the sixth segment broadly rounded, strongly reflexed, obsolete notched in the middle and fringed with long whitish pubescence, also a thin patch of long pale pubescence on the disk of this segment; apical segment very slightly and obtusely emarginate at tip. Length $5\frac{1}{2}$ lines.

Hab.—New York, Virginia. Three ♂ specimens. Coll. Entom. Soc. Philadelphia, and Mr. E. Norton.

Readily distinguished by the joints of the intermediate tarsi being subtriangular and broadly dilated.

6. *O. hudsonica*, n. sp.

Male.—Head black, finely and densely punctured, clothed with long ochraceous pubescence which is dense on the face; antennæ black, nearly as long as the thorax. Thorax black, finely and densely punctured, thickly clothed with long ochraceous pubescence, which is paler and more sparing beneath; tegulæ black, clothed with ochraceous pubescence. Wings subhyaline, the marginal cell and the apical margins clouded; nervures black. Legs black, thinly clothed with ochraceous pubescence; apical joints of the tarsi rufous. Abdomen elongate, clavate, much narrowed towards the base and incurved at the apex; black, shining, densely and minutely punctured, the apical margin of the segments above smooth and shining; basal segment above clothed with ochraceous pubescence, the remaining segments with black pubescence, that on the two apical segments mixed with fuscous and ochraceous; apical margin of the sixth segment broadly rounded, reflexed, obtusely notched on the middle and sulcate on the disk; apical segment slightly emarginate at tip; the margin of the second segment beneath is produced into a large semicircular flattened plate. Length 5 lines.

Hab.—Hudson's Bay Territory. One specimen. Coll. Mr. E. Norton.

Resembles *O. latitarsis* in its general form, but quite distinct. These two species, especially the former, have much the appearance of certain males of *Megachile*, e. g. *M. melanophæa* Smith, but the maxillary palpi are 4-jointed.

7. *O. chalybea*, Smith.

Osmia chalybea, Smith, Brit. Mus. Cat. i, p. 143. (1854.)

"*Female*. Length 6 lines.—Steel-blue, head very large, subquadrate and strongly punctured, the abdomen more finely so; the anterior margin [of the clypeus] produced in the middle, the apex of the lobe emarginate, the margin on each side crenulated; the mandibles very large, a deep groove running along their inferior margin from the apex to the base, where it terminates in a pit or hollow. Thorax, the sides thinly covered with griseous pubescence; beneath densely clothed with black pubescence.

"*Male*.—Closely resembles the female, the margin of the clypeus in this sex is entire, and the margin of the apical segment notched in the middle; beneath, the ventral segment bidentate.

"*Hab*.—St. John's Bluff, East Florida."

One ♀ specimen of this fine insect, from Florida, is in the collection of Mr. Edward Norton. I have not seen the male.

8. *O. lignaria*, Say.

Osmia lignaria, Say, Bost. Journ. Nat. Hist. i, p. 399 ♂ ♀. (1837.)

Female.—Head large, subquadrate, bluish-green or dark blue, finely and densely punctured, cheeks and vertex clothed with black pubescence, that on the face is long, somewhat dense and whitish, sometimes slightly mixed with black; anterior margin of the clypeus produced and deeply emarginate; mandibles stout, deeply channelled along the outer margin, and having a prominent tubercle on each side at base; antennæ longer than the head, black. Thorax bluish-green or dark blue, finely and densely punctured, clothed with rather long pubescence, which is whitish slightly mixed with black above and entirely black beneath; disk with a finely impressed longitudinal line; tegulæ black, smooth and shining. Wings subhyaline, almost hyaline, the apical margins and the costal half of the marginal cell tinged with fuliginous. Legs black, with black pubescence, that on the femora beneath sometimes pale. Abdomen subglobose, bluish-green or dark blue, rather densely and finely punctured, shining; the basal segment above and often the basal half of the second segment clothed with pale pubescence, the remaining segments with rather short black pubescence; beneath, the ventral scopa is dense and black. Length 4–6 lines.

Male.—Closely resembles the female, but is smaller and more paral-

lel; the head is clothed with long white pubescence, that on the face being very dense; the antennæ are as long as the thorax; the anterior margin of the clypeus is smooth, shining and scarcely emarginate; the thorax beneath, except immediately under the base of the wings, and the legs, especially the femora beneath, are clothed with long white pubescence; apical margins of the sixth and seventh segments are entire, and the ventral segments have a rather long white pubescence.

Hab.—Conn., N. Y., N. J., Penn., Del., Va., and Kansas. Numerous specimens. Coll. Entom. Soc. Philad., and Mr. E. Norton.

A common species, and varies in color from blue to green and is even sometimes purplish; the most general color, however, being bluish-green. The deeply emarginate clypeus will readily distinguish the ♀ of this and the next species from all others known to me.

9. *O. propinqua*, n. sp.

Female.—Head large, subquadrate, as wide as the thorax, dark greenish-blue, densely and finely punctured, clothed with long black pubescence, which is mixed with ochraceous about the insertion of the antennæ; anterior margin of the clypeus strongly produced, and broadly, deeply and squarely emarginate in the middle, so as to leave on each side a rather long, stout, obtuse tooth, the outer face of the emargination black, smooth and shining; mandibles stout, black, deeply channelled with the apex deeply bifid; on each side of the extreme base of the mandibles a large smooth, shining tubercle, which has a deep impression posteriorly; antennæ black, rather longer than the head. Thorax blue-green, finely and densely punctured, clothed with long black pubescence, mixed with ochraceous above; tegulæ black, shining, punctured. Wings subhyaline, costal half of the marginal cell and the apical margins clouded; nervures blackish. Legs black, clothed with black pubescence. Abdomen subglobose, greenish-blue, shining, densely and minutely punctured; the two basal segments above clothed with long ochraceous pubescence, the remaining segments with rather short black pubescence; beneath the ventral scopa is dense and black. Length 5½ lines.

Hab.—Fort Crook, California. Mr. H. Ulke. Coll. Entom. Soc. Philadelphia.

Closely resembles *O. lignaria* Say, but differs principally by the emargination of the clypeus being deeper and broader, and thereby

making the tooth on each side much more prominent. It may be nothing more than a variety of that species.

10. *O. californica*, n. sp.

Female.—Head subtransverse, as wide as the thorax, densely and rather strongly punctured, black tinged with dark green, clothed with rather long black pubescence; clypeus more strongly and less densely punctured, prominent, convex, shining, with a smooth line down its middle, anterior margin rather deeply emarginate; mandibles robust. apical tooth long and acute, deeply channelled along the outer margin; antennae black, scape shining, slightly tinged with green, flagellum beneath subsericeous. Thorax finely and densely punctured, black tinged with dark green, thickly clothed with long black pubescence; on each side above the tegulae a very small smooth shining spot; metathorax tinged with deep blue; tegulae black, shining, finely punctured. Wings hyaline, the marginal and first submarginal cells and the apical margins faintly stained with fuscous; nervures blackish. Legs black, punctured, clothed with short black pubescence, the tarsi beneath with short fuscous pubescence. Abdomen subglobose, minutely punctured, black, with a greenish-blue reflection, shining, rather thickly clothed with short black pubescence; beneath, the ventral scopa is dense and black. Length 5 lines.

Hab.—Fort Crook, California. Mr. H. Ulke. Coll. Ent. Soc. Philad.

Shaped like *O. lignaria* Say, but is at once distinguished from that species by the black pubescence and the shape of the clypeus.

11. *O. montana*, n. sp.

Male.—Head subquadrate, as wide as the thorax, densely and rather strongly punctured, deep blue, tinged with green anteriorly; face densely clothed with long whitish pubescence; the vertex has some long ochraceous, and the cheeks a rather long dense black pubescence; clypeus more finely punctured, anterior margin truncate, smooth and shining; antennae as long as the head and thorax, black, flagellum piceous beneath. Thorax finely and very densely punctured; dark blue, opaque, clothed above with long ochraceous, and below with black pubescence; disk in front with a smooth shining longitudinal line and on each side of this line there is a very short impressed line proceeding from the anterior margin and extending obliquely inwards; tegulae black and shining. Wings hyaline, nervures fuscous. Legs black,

shining, clothed with black pubescence, the anterior femora beneath with long ochraceous pubescence; apical joints of the tarsi ferruginous. Abdomen subovate, deep blue, densely and finely punctured, the basal segment as well as a portion of the second segment, clothed with ochraceous pubescence, that on the basal segment long; remaining segments with short black pubescence; apical segment notched in the middle; beneath, the pubescence is black. Length $4\frac{1}{2}$ lines.

Hab.—Pike's Peak, Colorado Territory. Two specimens. Coll. Entom. Soc. Philadelphia.

Resembles in form some of the males of *O. lignaria* Say, but quite distinct; the wings of the two specimens before me are purely hyaline.

12. *O. densa*, n. sp.

Female.—Head subtransverse, slightly wider than the thorax, dark green, slightly tinged with blue about the clypeus, densely and finely punctured, the punctures rather finer on the clypeus; the latter somewhat prominent, densely clothed with short black pubescence, with the anterior margin depressed, truncate, black, smooth and shining; vertex clothed with rather long fuscous pubescence, slightly mixed with ochraceous; mandibles stout, deeply channelled along the outer margin and armed with three short blunt teeth, the innermost one bifid; antennae rather longer than the head, black. Thorax dark opaque-blue anteriorly, dark green with blue reflections posteriorly, very densely, confluent and rather strongly punctured, anteriorly the punctures are so dense and confluent as to appear granulate, on the scutellum and metathorax the punctures are finer; clothed with rather long ochraceous pubescence; disk of the thorax in front with a finely impressed longitudinal line, and on each side above the tegulae a minute, smooth, shining spot; tegulae blackish-piceous, slightly tinged with green, sparsely punctured, shining. Wings subhyaline, apical margin slightly clouded, nervures black. Legs black, shining, profoundly punctured, clothed with short black pubescence. Abdomen subglobose, densely and rather strongly punctured, dark green, shining, apical margins of the segments steel-blue, smooth and subdepressed; the basal segment above thinly clothed with ochraceous pubescence, that on the apical segment somewhat fuscous; beneath, the ventral scopa is dense and black. Length $4\frac{1}{2}$ lines.

Hab.—Pike's Peak, Colorado Territory. Coll. Entom. Soc. Philad.

Easily distinguished from all others known to me by the very dense punctation, especially of the thorax. Much of the pubescence is rubbed off of the single specimen before me.

13. *O. frigida*, Smith.

Osmia frigida, Smith, Brit. Mus. Cat. i, p. 142, ♂ ♀. (1854.)

"*Female*. Length 5 lines.—Black, the head has an ochraceous pubescence, which is dense on the face, and sparing on the cheeks and vertex. Thorax, the disk thickly clothed with ochraceous pubescence, the femora have a thin fringe beneath of the same color, on the tibiae and tarsi it is fuscous; wings subhyaline, their apical margins faintly clouded; the two basal segments of the abdomen thinly clothed with ochraceous pubescence; on the third, fourth and fifth it is black; the apical segment covered with very short ochraceous pubescence; beneath it is dense and black.

"*Male*. Length 3–4 lines.—The clypeus covered with long white pubescence, on the vertex and disk of the thorax it is long, thin and pale ochraceous; the base of the abdomen has a little scattered long pale pubescence, otherwise it is short, sparing and fuscous; the margin of the fifth segment fringed with brown pubescence; the sixth segment has down the middle a shallow longitudinal channel; the apical margin entire.

"*Hab*.—Hudson's Bay."

Unknown to me.

14. *O. bucconis*, Say.

Osmia bucconis, Say, Bost. Journ. Nat. Hist. i, p. 400, ♂ ♀. (1837.)

"*Female*.—Body black, with rather short gray hairs, and obvious, dense punctures: head rather large, long between the eyes and thorax: nasus entire: mandibles with a patch of dense prostrate hairs near the tip: wings hyaline: nervures fuscous; wing-scale piceous: tergum with short, blackish hairs; segments rather convex, narrow, white bands of prostrate short hairs, wider each side; towards the posterior extremity with numerous white, short hairs, obvious in profile; posterior tarsi with longer hairs, tinted with ferruginous; venter with fulvous hairs. Length over three-tenths of an inch.

"*Male*.—Resembles the female, but is smaller, and the tail has four distant denticulations. Length one-fourth of an inch.

"*Hab*.—Indiana."

I have not seen any specimens which answer to the above description.

15. *O. purpurea*, n. sp.

"*Female*.—Head rather large, as wide as the thorax, dark purple, densely and finely punctured, thinly clothed with yellowish-white pubescence, which is longer on the sides of the face and cheeks, and short and sparse on the clypeus; anterior margin of the clypeus entire and fringed beneath with fulvous pubescence, the mandibles also clothed with short fulvous pubescence; antennæ short and black. Thorax dark purple, finely and densely punctured, clothed with yellowish-white pubescence which is paler beneath; tegulae black, smooth and shining. Wings subhyaline, apical margin faintly clouded. Legs black, with short pale pubescence, tarsi beneath with fulvous pubescence. Abdomen subglobose, dark purple, slightly tinged with blue, densely, rather finely and confluent punctured, clothed with short, suberect, pale yellowish pubescence; on the basal segment and on the sides, the pubescence is rather long and whitish; the posterior margins of the second and three following segments are fringed with whitish pubescence, sometimes interrupted on the middle of the second and third segments; on the apical segment the pubescence is short, dense and whitish; beneath, the ventral scopa is rather dense and black. Length $3\frac{1}{2}$ – $4\frac{1}{2}$ lines.

"*Hab*.—Conn., Penn., N. Jersey. Five ♀ specimens. Coll. Entom. Soc. Philad., and Mr. Edward Norton.

The dark purple color and the narrow whitish fasciæ of the abdomen of this species, will readily distinguish it from all others known to me. The whitish apical fringe of the abdominal segments are very conspicuous when held in certain lights, and also on the apex of the abdomen where the segments are more retracted.

The specimens before me of this species were labelled *O. bucconis* Say, but in that species the color is said to be "black," and the ventral scopa "fulvous"; but in the species before me the general color of the body is conspicuously dark purple, and the ventral scopa is black.

16. *O. sericea*, n. sp.

"*Male*.—Head black with a slight blue-green reflection, densely and

finely punctured; face thickly clothed with long yellowish-white pubescence, that on the vertex and cheeks long and sparse; antennæ about twice as long as the head, black, the flagellum beneath rufo-testaceous. Thorax black with a blue-green reflection, densely and finely punctured, clothed, especially on the sides and beneath, with rather long yellowish-white pubescence; tegulæ black, shining. Wings hyaline, apical margins faintly clouded, nervures black. Legs black with a slight greenish tinge, shining, clothed with short pale glittering pubescence; the tarsi beneath with yellow pubescence, the apical joints rufo-piceous. Abdomen rather short, subglobose, black faintly tinged with blue and purple, very closely, finely and uniformly punctured, densely clothed above with very short pale fuscous pubescence which has a pale sericeous appearance in certain lights; sides of the basal segment and also of the apical segments have the pubescence rather long and whitish; apical margin of the sixth segment sinuate on each side and rather deeply and obtusely notched in the middle; apical segment bidentate; beneath, the ventral segments are flat and fringed posteriorly with yellowish-white pubescence. Length $3\frac{1}{2}$ lines.

Hab.—Rocky Mountains, Colorado Territory. Coll. Ent. Soc. Phil. Somewhat resembles *O. purpurea*, but the punctation of the abdomen is finer and the segments have no appearance of an apical whitish fringe which is more or less conspicuous in that species.

17. *O. simillima*, Smith.

Osmia simillima, Smith, Brit. Mus. Cat. i, p. 142, ♂ ♀ (1854.)

Female.—Head rather large, as wide as the thorax, bluish-green, densely and rather finely punctured, thinly clothed with whitish pubescence; clypeus more strongly punctured, apical margin truncate; antennæ short, black. Thorax bluish-green, densely and finely punctured, clothed with rather long whitish pubescence. Wings subhyaline, their apical margins faintly clouded. Legs black, with a short pale pubescence; the tarsi beneath with blackish pubescence. Abdomen subglobose, blue, tinged with green, polished, rather finely punctured; apical margin of the segments smooth; the segments above clothed with short whitish pubescence, that on the basal segment longest and that on the sides and on the apical segment more dense; beneath, the ventral scopa is dense and black. Length $4\frac{1}{2}$ lines.

Male. Length 4 lines.—Head and thorax of a bronzed green,

abdomen blue; the antennæ a little longer than the head and thorax, setaceous, fulvo-testaceous beneath; the face thickly covered with long white pubescence, a similar pubescence is also more thinly scattered over the vertex, thorax and base of the abdomen; wings as in the female; the apical segment notched in the middle; beneath, the ventral segment is bidentate."

Hab.—Nova Scotia; United States (Smith); Connecticut; Great Slave Lake, British America. Two ♀ specimens. Coll. Mr. E. Norton.

I have not seen the male of this species, and am somewhat uncertain that the female specimens from which I drew up the above description are the true *simillima* of Smith, as his description does not quite accord with the specimens I have examined.

18. *O. atriventris*, n. sp.

Female.—Head subquadrate, as wide as the thorax, dull blue-green, strongly tinged with blue about the clypeus, densely and somewhat finely punctured, clothed above and beneath with rather long white pubescence; anterior margin of the clypeus slightly and obtusely emarginate; mandibles black; antennæ rather longer than the head, black, the scape slightly tinged with green and the flagellum beneath with rufo-testaceous. Thorax dull blue-green, densely and finely punctured, clothed above and beneath with rather long white pubescence; disk in front with a finely impressed longitudinal line, and on each side above the tegulæ a small smooth shining spot; tegulæ black, shining. Wings subhyaline, faintly clouded; nervures black. Legs black, shining, thinly clothed with short pale hairs. Abdomen short, subglobose, dull blue-green, shining, densely and finely punctured, clothed with whitish pubescence, which is long on the basal segment, shorter on the sides and apex of the abdomen and very short on the segments above; beneath, the ventral scopa is dense and black. Length 4 lines.

Hab.—Connecticut. Two specimens. Coll. Mr. E. Norton.

Resembles *O. simillima*, Smith, but is much smaller and the punctation of the abdomen much more dense and rather finer.

19. *O. dubia*, n. sp.

Female.—Head large, subquadrate, rather wider than the thorax, dark blue-green, clypeus deep blue, finely and densely punctured, rather thinly clothed with whitish pubescence which is slightly inter-

mixed with fuscous on the face; clypeus deep blue, its anterior margin truncate; mandibles stout, black, channelled along the outer margin and armed with three teeth, the inner one blunt and bifid, the apical one rather long and acute; antennæ slightly longer than the head, black, shining, flagellum beneath tinged with rufo-testaceous. Thorax dull blue-green, densely and finely punctured, clothed with pale ochraceous pubescence, which is long above, and rather short and mixed with fuscous beneath; disk in front with a very finely impressed longitudinal line, and on each side above the tegulæ, a minute shining spot; tegulæ black, tinged with green, smooth and shining. Wings subhyaline, faintly clouded; nervures blackish. Legs black, shining, sparsely clothed with short fuscous pubescence. Abdomen short, subglobose, dark blue-green, shining, densely, finely and confluent punctured; basal segment above thinly clothed with rather long whitish pubescence, remaining segments with very short blackish pubescence, having a sericeous appearance in certain lights; beneath, the ventral scopa is dense and black. Length 4 lines.

Hab.—Pike's Peak, Colorado Territory. One specimen. Coll. Entom. Soc. Philadelphia.

Closely resembles *O. atriventris*, but the head is proportionally larger, the punctuation of the abdomen is not so distinct, the pubescence not so dense and is of a different color on the abdomen above.

20. *O. distincta*, n. sp.

Female.—Head as wide as the thorax, dark greenish-blue, shining, densely and finely punctured; vertex and face thickly clothed with long pale golden-yellow pubescence, slightly fuscous on the vertex; anterior margin of the clypeus slightly iridescent, and somewhat emarginate; antennæ rather longer than the head, black. Thorax dark green with a slight bluish reflection, densely and finely punctured, thickly clothed with rather long hoary pubescence, anterior margin of the scutellum slightly impressed; tegulæ black, tinged with purple, smooth and shining. Wings almost hyaline, having a very faint tinge of fuscous; nervures blackish. Legs black, slightly tinged with green, shining, clothed beneath with short pale pubescence; tarsi beneath with fuscous pubescence. Abdomen short, broad, only slightly convex above, densely and finely punctured, blue-green, shining; basal segment above clothed with hoary pubescence, the remaining segments,

especially the apical one, with very short pale sericeous pubescence; beneath, the ventral scopa is dense and white. Length 4 lines.

Hab.—Connecticut. One specimen. Coll. Mr. E. Norton.

Allied to the two following species, but is broader, more robust, with the abdomen shorter and only slightly convex above. It is distinguished at once from the three preceding species by its ventral scopa being white.

21. *O. albiventris*, n. sp.

Female.—Head as wide as the thorax, greenish-blue, shining, sometimes entirely deep blue; densely and finely punctured, clothed with long hoary pubescence; anterior margin of the clypeus truncate, depressed and shining; antennæ as long as the head, black. Thorax dark blue green, sometimes entirely deep blue, densely and finely punctured, thickly clothed with rather long hoary pubescence; tegulæ black, shining. Wings either hyaline or subhyaline, nervures black. Legs black, shining, clothed especially beneath with hoary pubescence. Abdomen ovate, dark bluish-green, shining, densely, very finely and confluent punctured; basal segment above thinly clothed with long hoary pubescence, the remaining segments with very short pale pubescence, that on the apical segment more dense; beneath, the ventral scopa is dense and white. Length 4 lines.

Male.—Resembles the female, except that the face is densely clothed with long hoary pubescence, the antennæ nearly as long as the thorax, and the legs and the abdomen above are more pilose. The apical margin of the sixth segment is entire, and that of the apical segment absolutely notched in the middle. Length $3\frac{1}{2}$ lines.

Hab.—Conn., New York, Penn. 8 ♀, 3 ♂ specimens. Coll. Entom. Soc. Philad., and Mr. E. Norton.

Distinguished from the next species by the much finer and closer punctuation, especially of the abdomen.

22. *O. conjuncta*, n. sp.

Female.—Head as wide as the thorax, dark blue-green, densely and rather strongly punctured, shining, with a blackish opaque patch above the antennæ which disappears when viewed in certain lights, clothed with rather long pale pubescence, slightly intermixed with pale fuscous on the clypeus, the anterior margin of which is rather strongly emargi-

nate; antennæ rather longer than the head, black. Thorax dull blue-green, densely and rather strongly punctured, clothed with whitish pubescence, which is more dense and longer on each side of the metathorax and on the pleura; tegulæ black, tinged with purple, smooth and shining. Wings fusco-hyaline. Legs black, tinged with blue-green, shining, clothed with pale hairs; tarsi beneath with a pale yellowish sericeous pubescence. Abdomen ovate, dark green, shining, rather densely, uniformly and somewhat strongly punctured, the punctures on the apical segment very dense and fine; segments above clothed with very short pale pubescence; beneath, the ventral scopa is dense and white. Length 4 lines.

Hab.—Connecticut. One specimen. Coll. Mr. E. Norton.

Resembles *O. albiventris* in size and form, but is distinguished by the punctation of the abdomen being much stronger and less dense; the punctation of the head and thorax is also stronger. The insect is much less pilose, but much of the pubescence has apparently been rubbed off.

23. *O. proxima*, n. sp.

Male.—Head green, densely and very finely punctured, clothed with rather long whitish pubescence, which is very dense and white on the clypeus; antennæ nearly as long as the thorax, black. Thorax dark green, densely and very finely punctured, thickly clothed with long whitish pubescence; tegulæ black, slightly tinged with green, smooth and shining. Wings hyaline, apical margin faintly clouded; nervures blackish. Legs green or blue-green, clothed with short pale pubescence. Abdomen green or blue-green, densely and very finely punctured, the apical margins of the segments above smooth and shining; sides of the basal segment above thinly clothed with whitish pubescence; the remaining segments with a very short sparse pale pubescence; the apical margin of the sixth segment is produced, reflexed and notched in the middle, and that of the apical segment is very deeply notched in the middle. Length $3\frac{1}{2}$ lines.

Hab.—Maine and Fort Good Hope, Mackenzie River, British America. Two specimens. Coll. Mr. E. Norton.

Resembles the males of *O. albiventris*, but the apical margin of the sixth abdominal segment in that species is entire.

24. *O. canadensis*, n. sp.

Male.—Head green, finely and densely punctured, clothed with long white pubescence, which is very dense on the face; anterior margin of the clypeus smooth, black, with several small indentations and fringed beneath with white pubescence; antennæ rather longer than the head and thorax, black, joints of the flagellum somewhat flattened and contracted at base. Thorax green, finely and densely punctured, clothed with long whitish hairs; tegulæ black, shining, slightly tinged with green. Wings subhyaline, apical margins faintly clouded; nervures blackish. Legs rather long, green, punctured, clothed, especially beneath, with rather long whitish pubescence; tarsi beneath with pale fuscous pubescence. Abdomen oval, green, shining, densely and very finely punctured, apical margin of the segments above smooth and shining; segments above clothed with whitish pubescence, which is long and sparse on the basal and sides of the apical segments and short on the remaining segments; apical margin of the sixth segment slightly sinuate on each side and rather deeply and obtusely notched in the middle, and that of the apical segment bidentate; beneath, the ventral segments are flat, densely and finely punctured, shining and tinged with deep blue. Length 4 lines.

Hab.—Canada West. Mr. Wm. Saunders. Coll. Ent. Soc. Philad.

Differs from *O. proxima*, by the shape and greater length of the antennæ, by the legs being longer and by the more elongate form of the insect.

25. *O. cognata*, n. sp.

Male.—Head green, very finely and densely punctured; face thickly clothed with long whitish pubescence, the vertex and cheeks with a thin pubescence of the same color; anterior margin of the clypeus truncate, minutely denticulated and fringed beneath with white pubescence; antennæ as long as the head and thorax, black, joints of the flagellum subdepressed, contracted at base and tinged with rufo-piceous beneath. Thorax dark green, densely and finely punctured, thinly clothed with rather long whitish pubescence; tegulæ black, faintly tinged with green, smooth and shining. Wings subhyaline, nervures blackish. Legs black, tinged with blue and green, sparsely clothed with pale pubescence. Abdomen elongate, subovate, blue slightly tinged with green, shining, densely and minutely punctured, apical

margin of the segments smooth and shining; clothed above, especially towards the tip, with short pale pubescence; apical margin of the sixth segment somewhat reflexed and rather deeply and obtusely notched in the middle, and that of the apical segment bidentate. Length $4\frac{1}{2}$ lines.

Hab.—Illinois. Two specimens. Coll. Mr. E. Norton.

Larger than *O. canadensis*, from which it can be easily distinguished by the smoother appearance and blue color of the abdomen.

26. *O. fulgida*, n. sp.

Female.—Head subquadrate, about as wide as the thorax, brilliant green with blue reflections, finely and densely punctured, thickly clothed with rather long black pubescence; anterior margin of the clypeus black, truncate; mandibles stout, black, clothed with short black pubescence, armed with four teeth, the apical one rather long and subacute, the others short and blunt; antennæ black, scape green, finely punctured, tip of the flagellum beneath testaceous. Thorax finely and densely punctured, brilliant green, with bluish reflections, clothed with rather long black pubescence; disk longitudinally impressed in front, and on each side; midway between the disk and the tegulæ there is a very short, longitudinal impressed line which is black; metathorax more finely punctured, with a broad, deep depression on its disk; tegulæ black and shining. Wings subhyaline, apical margins clouded; nervures black. Legs bluish-green, clothed with short blackish pubescence, tarsi with fuscous pubescence. Abdomen subglobose, rather wider posteriorly, densely and minutely punctured, brilliant green, with bright blue reflections, polished, sparsely clothed with short black pubescence; basal segment in front deeply and longitudinally impressed; beneath, the ventral scopa is dense and blackish-fuscous. Length $4\frac{1}{2}$ lines.

Hab.—Rocky Mountains, Col. Ter. One specimen. Coll. Entom. Soc. Philadelphia.

A very handsome species, having the colors remarkably bright and vivid. It resembles the next species but is more robust and somewhat differently shaped.

27. *O. viridis*, n. sp.

Female.—Narrow, elongate. Head subquadrate, as wide as the thorax, finely and densely punctured, brilliant blue-green, clothed with rather long black hairs, which are more dense beneath the antennæ;

clypeus, mandibles and antennæ as in the preceding species. Thorax densely and finely punctured, brilliant green with blue reflections, clothed with rather long black pubescence; scutellum and metathorax bright green, the latter deeply impressed on the disk; tegulæ black, smooth and polished. Wings subhyaline, apical margins faintly clouded; nervures blackish. Legs green, clothed with short black pubescence. Abdomen elongate, subovate, densely and minutely punctured, brilliant green, changing to deep blue in certain lights, clothed towards the apex with very short black pubescence; basal segment in front deeply impressed; beneath, the ventral scopa is dense and black. Length $4\frac{1}{2}$ lines.

Hab.—Rocky Mountains, Colorado Territory. One specimen. Coll. Entom. Soc. Philadelphia.

Closely resembles *O. fulgida* in color and punctation, but the form is more linear and not so robust; the abdomen is subovate and not subclavate as in that species. The color in both species is very bright and beautiful.

28. *O. pusilla*, n. sp.

Male.—Head dark blue-green, finely and densely punctured, clothed with pale hairs; anterior margin of the clypeus uneven; antennæ not as long as the thorax, black, flagellum testaceous beneath. Thorax dark blue-green, densely and finely punctured, clothed with long pale hairs; tegulæ green, smooth and shining. Wings hyaline, the apical margins very faintly clouded; nervures blackish. Legs blue-green, sparsely clothed with short pale pubescence. Abdomen elongate, subovate, dark blue, slightly tinged with green; shining, densely and minutely punctured, the apical margins of the segments smooth; the segments above clothed with whitish pubescence, that on the sides of the basal, and on the apical segments longer and more dense; apical margin of the sixth segment somewhat reflexed and deeply notched in the middle; apical segment bidentate; beneath, the ventral segments are flat, deep blue and pubescent. Length $3\frac{1}{4}$ lines.

Hab.—Pike's Peak, Col. Ter. One specimen. Coll. Ent. Soc. Philad.

29. *O. pumila*, n. sp.

Female.—Head as wide as the thorax, deep blue, densely and finely punctured, clothed with rather long whitish pubescence; anterior margin of the clypeus truncate; mandibles stout, black, apical tooth long

and acute; antennæ short, black. Thorax dark blue tinged with green, densely and finely punctured, clothed with long whitish hairs; tegulæ black, shining. Wings subhyaline, apical margins clouded; nervures fuscous. Legs black, sparsely clothed with short pale pubescence, the tarsi beneath with fuscous pubescence. Abdomen subovate, greenish-blue, shining, densely and minutely punctured, clothed with whitish pubescence, which is short and dense on the apical segments and long and sparse on the basal segments; beneath the ventral scopa is dense and white. Length 3 lines.

Hab.—Pennsylvania. One specimen. Coll. Entom. Soc. Philad.

Resembles *O. pusilla*, and may possibly be the ♀ of that species, although it is smaller.

30. *O. brevis*, n. sp.

Female.—Head large subquadrate, as wide as the thorax, deep blue, finely and closely punctured, clothed with long black pubescence, which is very dense on the clypeus, and slightly mixed with ochraceous on the vertex; clypeus prominent, anterior margin truncate; mandibles robust, deeply channelled along the outer margin, and armed with three teeth, the apical one long and subacute, the others short and blunt; antennæ about as long as the head, black. Thorax deep blue, finely and closely punctured, clothed above with ochraceous and beneath with black pubescence; disk in front with a finely impressed longitudinal line; tegulæ black, shining. Wings subhyaline, apical margins clouded; nervures blackish. Legs black, clothed with black pubescence. Abdomen short, subglobose, deep blue, finely punctured, shining; basal segment above thinly clothed with ochraceous pubescence; the remaining segments with a very short black pubescence; beneath, the ventral scopa is dense and black. Length 4 lines.

Hab.—Rocky Mountains, Col. Ter. Coll. Entom. Soc. Philad.

A short robust species, with the head nearly as large as the thorax.

31. *O. globosa*, n. sp.

Female.—Head subtransverse, black, densely, finely and uniformly punctured, sides of the face and the vertex clothed with long ochraceous pubescence, that on the clypeus short and black, about the insertion of the antennæ it is slightly mixed with fuscous; mandibles robust, deeply channelled along the outer margins and armed with three teeth, the innermost one bluntly bifid and the apical one long and

acute; antennæ about as long as the head, black. Thorax black, closely and finely punctured, densely clothed with long ochraceous pubescence; tegulæ black, finely punctured, shining. Wings subhyaline, apical margins faintly clouded, nervures black. Legs black, clothed with blackish pubescence, the tarsi beneath, with fuscous pubescence. Abdomen short, globose and finely punctured, black, subopaque; basal segment above clothed, especially on the sides, with long ochraceous pubescence, the remaining segments clothed with short fuscous pubescence, which appears ochraceous in certain lights, especially on the apical segment; beneath, the ventral scopa is dense and black. Length $3\frac{1}{2}$ lines.

Hab.—Great Slave Lake, British America. One specimen. Coll. Smithsonian Institution.

A small robust species, remarkable for its short globose abdomen.

32. *O. rustica*, n. sp.

Male.—Head large, subquadrate, as wide the thorax, bronze-green, densely and finely punctured, clothed with long bright rust-red pubescence, which is dense and yellowish beneath the antennæ, that on the cheeks beneath pale yellowish-white; antennæ longer than the head, black. Thorax bronze-green, very closely and finely punctured, densely clothed above with long bright rust-red pubescence, beneath it is yellowish-white and rather thin; tegulæ brassy-black, smooth and shining. Wings hyaline, apical margins faintly clouded; nervures blackish. Legs greenish-black, clothed with rather long pale yellowish pubescence; apical joints of the tarsi rufo-testaceous. Abdomen short, globose, bright bronze-green, shining, finely and densely punctured, clothed above with bright rust-red pubescence, which is rather long on the basal segment, and dense on the apical margins of the segments, especially the terminal ones; apical margin of the sixth segment strongly sinuate on each side and rather deeply notched in the middle; apical segment bidentate; beneath, the pubescence is thin and pale. Length $3\frac{1}{2}$ — $3\frac{3}{4}$ lines.

Hab.—Easton, Penn. Three ♂ specimens. Coll. Mr. E. Norton.

This is a beautiful little species; its form is short and robust, and may be at once distinguished from all other species known to me by its bright rust-red pubescence which is dense on the thorax and face, and the brassy-green color of the abdomen. The name I have adopted

for this species was taken from specimens so named in the Harrisian Collection at Boston.

33. *O. vicina*, n. sp.

Male.—Head large, as wide as the thorax, green, finely and closely punctured, clothed especially in front with long pale yellowish pubescence; mandibles black, shining, deeply bifid at tip; antennæ black, nearly as long as the thorax. Thorax bronze-green, closely and finely punctured, rather densely clothed with long yellowish pubescence; tegulæ black, shining. Wings hyaline, apical margins faintly clouded; nervures pale fuscous. Legs green, clothed with pale pubescence; tarsi beneath with yellowish pubescence, the apical joints rufous. Abdomen elongate, rather broader posteriorly, dull bronze-green, closely, finely and confluent punctured, clothed above with pale yellowish pubescence, which is long on the basal segments and more dense on the apical margin of the remaining segments, especially the terminal ones; apical margin of the sixth segment slightly reflexed, obtusely notched in the middle, and entire laterally; apical segment bidentate; beneath, the ventral segments are flat and tinged with blue. Length $3\frac{1}{4}$ lines.

Hab.—Virginia. Coll. Entom. Soc. Philadelphia.

Allied to the preceding, but more elongate, not so robust, and entirely of a different color.

Descriptions of several new species of North American APIDÆ.

BY E. T. CRESSON.

Genus *EPEOLUS*, Latr.

1. *Epeolus bifasciatus*, n. sp.

Male.—Black, opaque. Head rather coarsely and confluent punctured, clothed about the insertion of the antennæ with appressed whitish pubescence; antennæ short, black, shining, the three basal joints, as well as the labrum and mandibles, rufous. Thorax deeply, roughly and confluent punctured, the punctures much coarser than those of the head; the tubercles, tegulæ and scutellum rufous, the latter having the lateral teeth prominent and subacute; anterior margin of the mesothorax rufous and clothed with dense, scale-like, ochraceous pubes-