

## BEEES IN THE QUEENSLAND MUSEUM.

BY T. D. A. COCKERELL.

**Euryglossa aurescens obscura** n. subsp.

Female. Length about 7.5 mm., with mesothorax, scutellum, and axillæ red, abdomen dark green. The postscutellum is black and densely punctured. It differs from typical *E. aurescens* Ckll. in the darker (not at all orange) red of mesothorax\* and scutellum; the more strongly and closely punctured clypeus, mesothorax, and scutellum; and the dusky wings, with green and rosy iridescence, and black stigma. The flagellum is entirely dark, not red beneath as in typical *E. aurescens*. The subspecies is modified in the direction of *E. ephippiata* Smith.

Gosford, N.S.W., Nov. 20, 1927 (*A. J. Turner*).

**Euryglossa subsericea** Cockerell.

Female: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*).

**Euryglossa flavopicta ornatula** Cockerell.

Female: Lugano, N.S.W. (*H. P. Schrader*). This is the form reported in 1916 from Queensland.

**Pachyprosopis barbata** Cockerell.

Twelve males: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*).

**Pachyprosopis kellyi** Cockerell.

Twelve females: National Park, Q., Dec. 1923 (*H. Hacker*).

**Pachyprosopis angulifera** n. sp.

Male. Length about 4.6 mm.; head shining bright lemon yellow (including mandibles), with the occiput, vertex, and upper part of front, except in middle, black; in the middle of front the yellow is continued upward, narrowing, to middle ocellus; scape yellow; flagellum dark above, pale yellow beneath except apically; thorax and legs bright yellow, but mesothorax black except broadly at sides, and a large mark anteriorly which is deeply emarginate behind, and takes the form of two broad yellow triangles joined at their apices; scutellum and axillæ yellow, but postscutellum and all of metathorax that can be seen from above, black; tegulæ pellucid; wings clear, with large dark-brown stigma and pale-brown nervures; second cubital cell narrow and produced above; abdomen dark brown, with yellow bands at bases of segments 2 to 5, often largely concealed by the segment before; extreme apex fulvous; venter yellow.

Six males: National Park, Q., Dec. 1923 (*H. Hacker*). Very distinct by the character of the yellow markings.



**Pachyprosopis georgica** n. sp.

Female. Length about 6.3 mm.; head very large, wider than thorax, vertex and cheeks very large, eyes diverging below; clypeus very broad and short, the centre with a great deep basin about twice as broad as long, the whole polished, impunctate; mandibles very broad, bidentate, with a long apical tooth, and the base so placed that it is not at all parallel with the lower end of the eye, which touches the upper corner; cheeks beneath with a very large curved red tooth; surface of head polished and shining, reddish black, with the clypeus, mandibles (except apex), and cheeks posteriorly red, the red gradually shading into the darker colour of the other parts; antennæ pale red, scape very slender; prothorax, mesothorax, and scutellum shining terra-cotta red, other parts of thorax reddish black; tegulæ dark; wings hyaline, with dark stigma and nervures, second cubital cell long and narrow as usual in the genus, its form approximately lanceolate; basal nervure arched, falling a long way short of nervulus; first recurrent joining first cubital cell near end; legs bright ferruginous; abdomen with first segment and sides and base of second terra-cotta red, the rest black.

King George's Sound, W.A. (no other particulars known). A very distinct species, easily known by the large head, toothed below, the red mesothorax and scutellum, and the abdomen red basally and black apically.

**PSEUDHYLÆUS** new genus.

With the broad face and general build of *Euryglossa*, to which the species have been referred, but face markings more as in *Hylæus*. Mandibles pointed, moderately acute, simple in female, with an inner tooth in male; a small malar space, Caudal end of female very bristly, with no pygidial plate. Basal nervure moderately arched, not reaching nervulus; second cubital cell large and broad, receiving recurrent nervures near base and apex. Type *P. albocuneatus* (*Euryglossa albocuneata* Ckll.), and also including *P. hypoleucus* (*Euryglossa hypoleuca* Ckll.). These insects have had no satisfactory resting place, and it seems best to separate them as a distinct genus.

**Pseudhylæus albocuneatus** (Cockerell).

Two females, one male: Charleville, Queensland, Sept. 9-12, 1920 (*A. J. Turner*). The male is new. It is very like the male of *P. hypoleucus*, but larger and more robust, with the lateral face-marks more gradually attenuate above; scape thick, all black, flagellum very short, reddened beneath apically; mandibles with a light stripe, but lower side black; tegulæ dusky hyaline, with a large cream-coloured spot; third abdominal sternite with a very large outstanding black broadly truncate lamina. The labrum is sparsely covered with erect golden hairs. The anterior tibiæ are very broad, pale yellowish flushed with ferruginous, with a black stripe behind. The hind margins of the abdominal segments are broadly dull whitish, the first somewhat reddened. Stigma dark reddish brown.

**Trigona cassiæ** Cockerell.

Mr. Harold Hockings sends numerous examples, with the following interesting notes:—"Kootchar (native name) is from Brisbane district and exists in a wide area, many hundreds of miles north, south, and west, occupying tree hollows. Entrance to hive is through a tube of resinous mixture, which projects about an inch outwards from original opening; its diameter is from half to three-quarters inch; this tube is continued on the inner wall of the hive, into the food store. At night, outer opening is closed by a sheet of minute globules of sticky gum. Pollen and



**Trigona wybenica** n. sp.

Worker (type). Length about 3.75 mm.; head and thorax shining black, except that the scutellum, metathorax, and sides of thorax posteriorly vary from dull honey colour to black (perhaps a question of maturity); mandibles light yellowish ferruginous, darker and rounded at apex; malar space very short; labrum light yellow; face and front thinly beset with plumose white hairs; scape entirely clear orange-ferruginous; flagellum black or very dark above, reddened beneath, especially apically; sides of thorax with white pruinose pubescence; hair of scutellum pale and very short; tegulae piceous; wings clear, stigma and nervures pale brownish; legs mainly black, but knees reddened and tarsi with small joints ferruginous, or (probably due to immaturity) the basitarsi may be reddish, and the hind tibiae shining honey colour on inner side, with a large oval dark spot. The abdomen is short and in alcohol appears honey colour, but on drying it becomes very pale yellowish.

Male. Flagellum longer; abdomen dorsally dark brown, with the sutures pallid, beneath very pale yellowish, certainly very near to *T. laeviceps* Smith, but differing by the very pale abdomen, and I think certainly distinct. Singapore must be considered the type locality of *T. laeviceps*; for Aru I. specimen see Ann. Mag. Nat. Hist., Aug. 1923, p. 241. The specific name is derived from Wyben, which Mr. Hockings states is the native name of Thursday Island, where he collected the specimens.

Mr. Hockings sends the following notes:—"Is the smallest and has a yellowish abdomen; resembles Kootchar in some respects. Wax is dark chocolate; constructs a tubular protruding entrance as in Kootchar. Brood nest is a pile of pilular cells, also honey and pollen pots are constructed in separate positions; the brood nest sometimes is extended into any temporarily vacant adjacent space."

**Megachile chrysopyga** Smith.

Female: Perth, W.A. (*G. H. Hardy*). Male: Bunya Mts., Q., 3,000 ft., Jan. 4, 1926.

**Megachile quinquelineata** Cockerell.

Brisbane, March 18 (*H. Hacker*).

**Megachile macleayi** Cockerell.

Two females: Hughenden (*H. H. Batchelor*).

**Megachile henrici** Cockerell.

Female. Scopa with more black than usual. Lugano, N.S.W. (*H. P. Schrader*).

**Megachile lucidiventris** Smith.

Females: Lugano, N.S.W. (*H. P. Schrader*); Gordonvale (*W. C. Dormer*).

**Megachile latipes** Smith.

Males: Gordonvale (*W. C. Dormer*); Kiata, Victoria, Dec. 27 (*F. E. Wilson*). Is this the male of *M. lucidiventris*?

**Megachile semiluctuosa** Smith.

Male: Linga, Vict., Oct. 1922 (*F. E. Wilson*).



honey pots are placed in separate positions, and are up to half an inch in diameter. Wax is very dark cream colour, but produces best of clear wax on being melted. Brood nest is a globular pile of pillular cells, somewhat less than an eighth of an inch in diameter, between which the bees can pass, opening being at top or inclined slightly in direction in which extension may be proceeding. All building proceeds upwards from 'base,' and as the young emerge at the bottom of the brood nest the old cells are cast out and a new brood nest starts and replaces the old one as it matures and is cast out. Diameter of nest varies with strength of colony. Period from deposit of egg to emergence is 65 days, extending to 70 days in cold weather. These cells are filled with food; the queen at once deposits egg on surface of food and cell is quickly closed by one worker; this filling to closing applies to all four varieties sent."

With the bees, Mr. Hockings sends some flies, larvæ, pupæ, and adults, collected (where ?) Jan. 1888, and labelled as parasites of *Trigona* (what species ?). They are a species of *Cerioides*, rather related to the Indian *C. ornatifrons* (Brunetti), but considerably larger. They are not really parasites.

### *Trigona carbonaria* Smith.

Mr. Hockings sends many specimens from Moreton, with these notes:—"Karbi (native name). Is known from same district as Kootchar, and is at least as widely distributed. Entrance to hive is surrounded by an area of sticky resinous substance; honey and pollen pots are jumbled together indiscriminately, and are distinguishable only by breaking. Wax is dark chocolate. Brood nest see No. 3."

The pale hair on the dorsum of thorax has sparse black bristles intermixed. The flagellum is dark beneath, with at most a little red at base and more at apex.

On re-examining the type of *T. angophoræ* Cockerell I find no very substantial difference. The face at level of antennæ is of practically the same width, and the thoracic hair is essentially the same. The wings are unusually dusky, and the flagellum is ferruginous beneath. I think we must write *T. carbonaria angophoræ*, at least until the form is better known.

### *Trigona carbonaria hockingsi* n. subsp.

Cape York Peninsula, a series sent by Mr. Hockings under his No. 3. It is distinctly larger than *T. carbonaria* (thus much too large for *T. birsi* Friese), and has the flagellum clear red beneath. The scutellum has much coarse black hair. Mr. Hockings writes: "It resembles No. 2 (*T. carbonaria*) in all respects, except that it is larger, and it builds a large cellular excrescence over the hive entrance and approaches; it is composed of resinous substance and dirt. The bees pass through its passages into the entrance. Wax dark chocolate. Brood nest is a one-sided comb in Nos. 2 and 3; it is constructed upwards, held in position by a framework of wax rods; it is in the form of a spiral staircase compressed, the middle region usually having the greatest diameter. The individual cells are larger than those of No. 2. As emergence ensues the brood nest is replaced as in all other varieties."

The *T. carbonaria* which I collected at Port Darwin have the flagellum rather obscurely reddened beneath, and coarse black hair on the scutellum, so they must really be referred to *hockingsi*, rather than to *carbonaria* proper. Perhaps *hockingsi* should stand as a distinct species; it is more distinct from *carbonaria* than is *angophoræ*.



**Megachile gilbertiella** Cockerell.

Female: Gordonvale, Oct. 1, 1922 (W. C. Dormer).

**Megachile ciliatipes** Cockerell.

I cannot separate this from the male of *Androgynella detera* Ckll. Search should be made in Brisbane for *Androgynella* females.

**Megachile cetera** Cockerell.

I find no satisfactory character to separate the female of the Hawaiian *M. timberlakei* Ckll. from *M. cetera*. I have no Australian male closely resembling *M. timberlakei*.

**Megachile alani** n. sp.

Female. Length 11.5 mm., varying to 9.5; rather robust, but of parallel-sided type; black, including legs, mandibles, and antennæ, but tegument of sixth abdominal segment (above and below) and narrow apical margin of penultimate tergite, clear ferruginous; head large and broad, orbits slightly diverging below; mandibles very robust, strongly grooved, parallel-sided, the apical margin with three very short rounded teeth; clypeus broad and short, the anterior margin strongly concave, forming a broad arch, in the middle with two very large shining pits, separated by a small ridge, the clypeus otherwise very densely punctured; upper edge of clypeus shining but supraclypeal area densely and finely punctured; sides of face, on each side of supraclypeal area, dull and minutely granular, and front the same; vertex broad, closely but irregularly punctured; cheeks broad, the surface finely grooved or striate; a tuft of white hair at each side of face; front with thin white hair; vertex with very thin short brownish hair; mesothorax and scutellum dull and very densely punctured; conspicuous dense white hair-spots at posterior angles of mesothorax, at sides of prothorax, fringing tubercles, and (very small) between scutellum and mesothorax; mesopleura densely rugoso-punctate; thorax with very little hair, the pleura and metathorax showing loose white hair; tegulæ very dark reddish brown; wings hyaline, nervures and stigma dark; second cubital cell long, receiving first recurrent nervure at a distance from base about equal to half first intercubitus; legs with pale hair, conspicuous and silvery on outer side of tarsi, especially middle tarsi; hind tarsi not broadened; spurs whitish; abdomen convex, closely punctured, the hair-bands very inconspicuous, fulvescent, except pure white tufts on each side of first segment; apical segments with short appressed fulvous hair; ventral scopa white, fulvous at extreme tip.

Two from Moree, N.S.W., March 1923 (Alan P. Dodd). It is very like *M. rhodura* Ckll., but easily separated by the structure of the clypeus. In some tables it runs to *M. modesta* Sm., but that has the tegument of the apex of the abdomen black.

**Megachile chrysopygopsis** n. sp.

Female. Length about 12.5 mm.; broad and robust, with broad abdomen; black, including legs, but flagellum chestnut-red beneath, and apical tooth of mandibles red; mandibles broad, quadridentate counting the inner corner; clypeus ordinary, shining but closely and coarsely punctured, lower margin simple, nearly straight; supraclypeal area in middle of disc highly polished and shining; front and sides of face with long rather dull white hair; vertex with dark fuscous hair; cheeks with long white hair; mesothorax and scutellum shining but closely and very distinctly punctured; pleura and metathorax with long dull white hair; sides of mesothorax



and scutellum with short fuscous hair; white hair-spots at sides of prothorax, posterior corners of mesothorax, tubercles (large), and a rather inconspicuous interrupted band in scutello-mesothoracic suture; there is a tuft of dark-fuscous or sooty hair on each side behind the tegulæ; tegulæ black with a dark-red spot; wings dusky hyaline, dark in upper part of marginal cell; legs with pale hair, dark purplish brown on inner side of hind tarsi; hind basitarsi broad; spurs dark; abdomen finely punctured; hind margins of first three segments reddish, with narrow white (or slightly yellowish) hair-bands; fourth and fifth segments with fulvous bands, on fourth white at extreme sides; fifth segment (except at base and sides) and sixth (except the broad apex) clothed with reddish fulvous tomentum; ventral scopa white, black on last segment and sides of penultimate.

Perth, W. Australia (*G. H. Hardy*, 142). Looks like *M. chrysopyga* Smith, but hair of face not orange.

***Megachile dinognatha* n. sp.**

Female. Length about 18.5 mm.; very robust with very large, broad, and rounded head; black, including mandibles, antennæ, tegulæ, and legs; hair of head and thorax very scanty, black on clypeus, white at sides of face, brownish white on front, dense and pure white at sides of metathorax, sooty on prothorax but white on tubercles; eyes purplish brown, strongly diverging below; mandibles extremely massive, strongly punctured, with two large teeth and a long cutting edge; clypeus very short and broad, very densely rugoso-punctate, the margin gently arched, shining and minutely crenulate; supraclypeal area densely rugose like clypeus; front with a pair of oblique obtuse ridges, which are polished and rather sparsely punctured; vertex shining, with irregular punctures of different sizes; cheeks very broad and rounded, polished, with scattered punctures; mesothorax and scutellum densely rugose, base of metathorax shining; wings dark fuscous, with violaceous tints; legs with prevailing brown hair, bright ferruginous on inner side of hind tarsi; spurs dark; hind basitarsi not broadened; abdomen finely punctured, shining on third segment but dull on fourth; no hair-bands, but fifth and sixth segments covered with appressed copper-red hair; the punctures at sides of third segment are large and sparse, while those on fourth are small and close; ventral scopa pale yellow, becoming dark fuscous at apex.

Hughenden (*H. H. Batchelor*). I find no close relative of this species; in the tables it runs nearest to the quite different *M. ferox* Sm. It must be associated with the species referred to the subgenus *Eumegachile*.

***Megachile semiclara* n. sp.**

Female. Length about 17.5 mm.; very robust, but of parallel-sided type; black, including mandibles, antennæ, tegulæ, and legs; hair of head and thorax mainly black, long and coarse on clypeus, short on mesothorax; on front, and upper part of sides of face, the hair is pale ochreous, mixed with black in middle; the thorax anteriorly below, and the tubercles, have white hair; mandibles massive, strongly grooved, with four large teeth; clypeus short and broad, dull, with a shining transverse apical ridge; supraclypeal area polished and impunctate in middle; ocelli large, amber colour; eyes reddish brown, inner orbits parallel; vertex moderately shining, with scattered large punctures; cheeks rounded, closely and minutely punctured; wings with more than basal half hyaline, the apical part fuscous, especially dark in marginal cell and the region below it; first recurrent nervure joining second cubital cell not far from base; mesothorax and scutellum dull and well



punctured, the scutellum densely covered with black hair; legs with black hair, more or less shining pale on femora, coppery red on inner side of anterior tibiae and tarsi, and middle tarsi; the femora and tibiae have the tegument more or less dark red; hind basitarsi moderately broad; spurs dark; abdomen broad and rather short; second and third tergites conspicuously polished in middle, the punctures on second large and widely scattered; basal tergite with black hair, but second and third with conspicuous bands of pure-white hair; fourth with a spot of white hair at each side; ventral scopa pure-white, black at extreme apex.

Cairns, Queensland (*A. P. Dodd*). Mr. Hacker had already labelled it as a new species. It is a very beautiful and distinct thing, by its bicoloured wings resembling *M. fabricator* Smith.

***Megachile batchelori* n. sp.**

Female. Length nearly 15 mm.; robust, but paralld-sided; black, including mandibles, antennae (flagellum very faintly brownish beneath), tegulae, and legs; hair of head and thorax abundant, white, but black hairs intermixed on clypeus and front, hair of vertex all black, some admixture of black hairs on mesothorax; eyes brown, inner orbits parallel; mandibles very broad, with two large teeth and a broad cutting edge; clypeus broad and rather short, dull and rough, covered with hair, but with a broadly arched shining transverse ridge above lower margin; vertex shining, with scattered punctures; cheeks finely and closely punctured, hairy; mesothorax dull, with many punctures, which however are not very conspicuous; base of metathorax dull; wings with more than basal half clear hyaline, the apical part abruptly fuliginous; first recurrent nervure joining second cubital cell near base; basal nervure falling far short of nervulus; legs with much pale greyish hair, rusty black on inner side of hind tarsi, distinctly red on inner side of anterior tibiae and tarsi; hind basitarsi little broadened; spurs dark, hind spurs unusually short; abdomen with first segment densely covered with white hairs; second and third segments with white hair-bands, thin in middle of third; apical segments with short black hair; second and third tergites shining; ventral scopa pure white, black on last two segments.

Hughenden (*H. H. Batchelor*). Another species with bicoloured wings, like *M. fabricator*. *M. fabricator* appears to be closely allied, but has the face and front with pale ochreous pubescence, and the clypeus with black.

***Megachile wilsoni* n. sp.**

Male. Length about 7 mm.; small and parallel-sided, *Heriades*-like; black, with the mandibles (except the bidentate apex), scape, tegulae, and legs bright chestnut red; face and front densely covered with long white hair; eyes pale reddish grey; facial quadrangle much longer than broad, eyes somewhat converging below; flagellum long and slender, black, not enlarged at end; vertex very densely punctured, but glistening between the punctures; hair of thorax white; mesothorax and scutellum very densely punctured (mesothorax coarsely), but glistening between the punctures; area of metathorax basally rugose, apically shining; wings hyaline, a little dusky apically, stigma and nervures dark; second cubital cell long; legs with thin white hair; anterior tarsi quite simple; anterior coxae black, not spined; abdomen well punctured, with distinct hair-bands, which are pale fulvous in middle, white at sides; on the first segment the band is reduced to large lateral patches, on the second it is widely interrupted, on the third thin or narrowly interrupted in middle, on the fourth entire; fifth and sixth segments densely covered with







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| 5. Abdomen with white hair-bands .. .. .   | <i>chrysopygopsis</i> Ckll. |
| Abdomen without hair-bands .. .. .   | 6.                          |
| 6. Smaller ; red hair extending on fourth tergite .. .. .  | <i>macleayi</i> Ckll.       |
| Larger ; no red hair on fourth tergite .. .. .   | <i>dinognatha</i> Ckll.     |
| 7. Abdomen with black hair at base ; mesopleura with black hair .. .. .                              | <i>semiclara</i> Ckll.      |
| Abdomen with white hair at base .. .. .  | 8.                          |
| 8. Wings with sharply contrasting colours, dark apically, hyaline basally .. .. .                    | <i>batchelor</i> i Ckll.    |
| Wings without such contrasting colours .. .. .   | 9.                          |
| 9. Small species with hyaline wings .. .. .  | <i>quinquelineata</i> Ckll. |
| Larger species with dark wings .. .. .   | <i>lucidiventris</i> Sm.    |
| 10. Antennæ broadly expanded at apex ; face with white hair .. .. .                                  | <i>semiluctuosa</i> Sm.     |
| Antennæ not expanded at apex .. .. .   | 11.                         |
| 11. Face with white hair ; all the tibiæ red .. .. .   | 12.                         |
| Face with yellow hair ; at least mid and hind tibiæ black .. .. .                                    | 13.                         |
| 12. Small ; scape red .. .. .  | <i>wilsoni</i> Ckll.        |
| Larger ; scape black .. .. .   | <i>hardyi</i> Ckll.         |
| 13. End of abdomen with red hair .. .. .   | <i>chrysopyga</i> Sm.       |
| End of abdomen without red hair ; hind tarsi creamy white with black spots at ends of joints .. .. . | <i>latipes</i> Sm.          |

When in Queensland, I caught only one specimen of *Megachile*, a male, *M. rhodogastra* Ckll., at Sherwood, March 2. It seems probable that *M. rhodogastra* and *M. heliophila* Ckll. are the sexes of one species.

#### PARACOLLETES Smith.

##### *Paracolletes callander* Cockerell.

Male : Perth, W.A. (*G. H. Hardy*, 143).

##### *Paracolletes fimbriatinus* Cockerell.

Male and female : Stanthorpe, Q., 5-11-23 (No. 527). The female is new. It is related to *P. gallipes* Ckll. more than to any female I possess, but is very distinct from it. Thorax above with rich fulvous hair ; front with fulvous hair ; sides of face with very pale yellowish hair ; clypeus very coarsely rugose, not keeled (it has a median keel in *P. gallipes*) ; end of abdomen with very dark fuscous hair (all pale in *P. gallipes*) ; abdomen below with broad creamy-white bands ; hind spur pectinate with long teeth ; stigma small but distinctly developed. It is a rather slender bee, about 14 mm. long. This is distinct from *P. fimbriatus* Smith, which has the stigma obsolete, mandibles ferruginous at apex (black in *P. fimbriatinus*), thorax clothed above with whitish pubescence, and scopa of hind legs silvery white (in *P. fimbriatinus* black on outer side of hind tibiæ and very pale yellowish on inner side).

##### *Paracolletes friesei* n. sp.

Female. Length about 11 mm. ; rather robust ; head blue-green, shining, the clypeus black, convex, and sparsely punctured ; supraclypeal area brassy or coppery ; scape and base of flagellum black (the rest lost) ; mandibles black ; face at sides, front, and cheeks with long white hair, top of head with black hair ; front



dull in middle; thorax dark blue green or greenish blue, the mesothorax and scutellum yellowish green with strong rosy tints; mesothorax closely punctured, it and the scutellum densely covered with very bright orange-ferruginous hair; thorax at sides and posteriorly with long white hair, but sooty in region of tubercles, postscutellum, and sides of metathorax above: area of metathorax with a sharp transverse keel; tegulae dark, slightly reddish; wings hyaline, nervures and the well-developed stigma dark reddish; basal nervure meeting nervulus; second cubital cell receiving recurrent about the middle; legs black, with the hair mainly black; much long white hair on under side of anterior femora, white hair at the base of middle and hind legs, and on anterior side of hind tibiae; abdomen highly polished, weakly punctured, bluish green and steel blue, without hair-bands; hair at apex black; venter with fringes of white hair.

King George's Sound, W.A. Falls near to *P. plumosus* Sm. and *P. carinatus* Sm., but easily known by the bright-red thoracic hair. It is the species which Friese (1924) described as *P. fervidus*, but that name is preoccupied.

***Paracolletes rebellis* Cockerell.**

Male: Jindebyne, N.S.W., 3,000 ft., March 1889 (*Helms*).

***Paracolletes carinatus* Smith.**

Female: Mt. Tambourine, 1923 (*W. H. Davidson*). Male: Maria Island, 6-2-18 (*G. H. Hardy*).

***Paracolletes bicristatus* n. sp.**

Female. Length about 8 mm.; robust, head black, with front and sides of face dark green; thorax black, with the mesothorax entirely dull, very dark blue or blue-black; scutellum black, with two shining areas on disc; metathorax dull at base, but the very obtuse transverse ridge of enclosure shining and appearing very faintly metallic; legs black, the tarsi slightly reddish, the hind basitarsi broad, pale ferruginous, dusky apically, with short hair on inner side, which seen from behind shines silvery white; abdomen somewhat shining, not evidently punctured, faintly greenish. Mandibles black, faintly reddened apically; antennae black; clypeus polished and sparsely punctured; hair of head very inconspicuous, erect and fuscous on vertex; mesothorax with short very inconspicuous black hair, anteriorly with white, only visible on lateral view; tubercles with a large dense tuft of yellowish-white hair; at each side of scutellum is a dense very conspicuous band of pale-fulvous tomentum, these bands converging caudad; pleura with thin white hair; tegulae black; wings hyaline, rosy-iridescent, stigma large, dark reddish, nervures fuscous; basal nervure arched, not quite reaching the oblique nervulus; second cubital cell much broadened below, receiving recurrent nervure at or a little before middle; marginal cell long and pointed; hind femora with a very large curled white scopa; hind tibiae with hair on outer side dark fuscous, on inner white; abdomen without bands, hair at apex black, rather scanty; venter with a white scopa.

Two females: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*). One has collected much orange pollen. A very distinct species, easily known by the bands of pale-fulvous or whitish hair on each side of scutellum. In the cotype the tufts of hair on tubercles and sides of scutellum may be described as white.



**Paracolletes advena worsfoldi** (Cockerell).

A female from King George's Sound is evidently *P. worsfoldi* Ckll., described from a single female in the British Museum. It is however only a race of *P. advena* (Smith), differing by the distinctly more shining mesothorax, and details of the venation. The basal nervure meets the nervulus; the first recurrent nervure is abruptly bent some distance from its end, and joins the second cubital cell well before the middle. In *P. advena* from Victoria the basal nervure falls a little short of the nervulus, and the broad second cubital cell receives the recurrent nervure in middle or a little beyond. In Brisbane *P. advena* the basal nervure is conspicuously short of the nervulus, and the first recurrent reaches second cubital a little before the middle. Neither Brisbane nor Victoria bees show the abrupt bend in the recurrent. In Smith's type of *P. advena* the recurrent joins second cubital a little before middle, and the basal nervure falls short of nervulus.

**Paracolletes nigrocinctus** Cockerell.

Kojarena, near Geraldton, W.A., Sept. 6, 1926 (*Nicholson*). One female, seven males. A specimen will be sent to the Queensland Museum. *P. tenuicinctus* Ckll. and *P. nigrocinctus* Ckll. are the sexes of one species.

**Paracolletes melbournensis clarki** n. subsp.

Female. Length about 11 mm.; clypeus highly polished, with scattered though distinct punctures; vertex with sooty or grey hair; thorax above with rather pale grey hair; black on disc of mesothorax and scutellum; scutellum anteriorly smooth and lilac-tinted; pleura with dull-white hair, that in region of tubercles sooty; tegulae very dark; wings strongly brownish; basal nervure meeting nervulus; second cubital cell receiving recurrent nervure about middle; abdomen olive green, without the strong punctures of *P. sexmaculatus* Ckll.

Perth, W.A. (*J. Clark*).

**Paracolletes plumosus** Smith.

Female: Sydney, N.S.W. (*Froggatt*, 191).

**Paracolletes eucalypti** Cockerell.

This was described from a male taken at Healesville, V. The female before me comes from Beaconsfield, Victoria (*F. E. Wilson*), and while it differs from the male in the entirely black legs, and the basal nervure almost meeting the nervulus, I am confident that it belongs here. It is smaller than *P. plumosus* Sm., and is especially distinguished by the dullish minutely sculptured surface of the bluish-green abdomen. Under the compound microscope this surface shows fine transverse lineolation and excessively minute punctures. The anterior wings are 7 mm. long. The hair at sides of thorax is partly black and partly dull white. Hair of apex of abdomen black; first three ventral fringes white, fourth sooty. Hind tibia with hair black on outer side, white on inner. Dorsum of thorax with black hair, but white anteriorly. This agrees so nearly with what the female of *P. eucalypti* ought to be, that we are not entitled to assume the existence of another, extremely closely related, species.

May I venture to suggest, in connection with this specimen, that when bees are pinned with short pins, and placed very high up, it is extremely difficult to handle them without damage? They cannot be properly examined without looking at the



under side, and this involves holding the head of the pin. The Nicholson specimens from W. Australia are admirably mounted, but taking Australian bees as they come, from old or new lots, they are very often hard to handle.

***Paracolletes microdontus* n. sp.**

Female. Length a little over 10 mm. ; black, with no metallic tints anywhere ; mandibles black, with a faint reddish tint subapically ; tegulae very dark reddish ; legs black. Head broad, but facial quadrangle longer than wide ; clypeus moderately convex, shining, with strong not very dense punctures, the disc somewhat flattened ; lower margin and corners of clypeus, and sides of face, with silvery white hair ; front and cheeks with white hair, but vertex with long black hair ; antennae black, the flagellum reddened beneath apically ; mesothorax and scutellum shining on disc, with sparse small punctures ; scutellum with no trace of a median sulcus (which is present in *P. tuberculatus* Ckll.), its posterior part dull ; postscutellum with a small but distinct tubercle ; area of metathorax dull, faintly shining on ridge, overlapped by long pale hairs ; thorax above with short grey and black hair ; much black on scutellum, and a broad black band across anterior part of mesothorax ; tubercles with white hair ; wings hyaline, slightly dusky ; stigma dark reddish, very small and narrow, but distinct ; nervures dark ; basal nervure meeting nervulus ; second cubital cell broad, receiving recurrent nervure a little before middle ; third cubital very long, much extended below, receiving second recurrent some distance from end ; scopa of hind tibiae very long, grey on outer side, white on inner ; abdomen without bands, dullish, the punctures excessively minute ; first three segments broadly but thinly clothed basally with fine white pile, giving the basal halves of second and third segments (when extended) a grey appearance, contrasting with the black beyond ; hind margins of segments broadly dark brownish, but the colour is too dark to give a banded effect ; hair at apex of abdomen black ; fourth ventral segment with much white hair, fifth with a fringe of black.

Two females from Perth, W.A. (*J. Clark*). The clypeus is totally different from that of *P. incanescens* Ckll. The dentate postscutellum and other characters separate it from *P. obscurus* Smith.

***Paracolletes semilucens* n. sp.**

Female. Length about 8.5 mm. ; black, small and rather slender, with rather the aspect of a male ; head broad ; mandibles black, faintly reddish at tip ; clypeus convex, sparsely but distinctly punctured, the lower half shining, the upper half dull, but extreme upper edge shining ; supraclypeal area dull, without evident punctures ; sides of face with thin white hair, and no black ; antennae black, flagellum obscurely reddish below ; front and vertex entirely dull ; vertex with some long black hair ; thorax with thin white hair at sides and behind, dorsally with very scanty fuscous hair ; mesothorax dull, not evidently punctate, the posterior disc more shining ; scutellum somewhat shining, hardly punctured, depressed in middle ; base of metathorax with upper face large, shining, no transverse grooves or acute keel ; tegulae chestnut red ; wings brownish hyaline, stigma and nervures dark reddish ; stigma large ; basal nervure falling a considerable distance short of nervulus ; second cubital cell broadened below, receiving recurrent nervure distinctly beyond middle ; third cubital elongated, receiving second recurrent some distance before end ; legs black, scopa of hind tibiae not very large, white, stained with fuscous posteriorly ; spurs clear red ; hair on inner side of hind tarsi appearing white in some lights, but pale orange in others ; abdomen dullish, not evidently



punctured, hind margins of segments narrowly reddish; no hair-bands, and very little hair, fourth tergite with a very thin fringe of pale hairs; apex with a small tuft of reddish-black hair; ventral fringes white; at each side of first tergite is a little raised boss.

Two females: Type Perth, W.A. (*J. Clark*); the other Swan R. (*J. S. Clark*). It may be compared with *P. sigillatus* Ckll., but is very distinct by the lack of broad hyaline margins to the tergites, dark hair at apex of abdomen, and red tegulæ. It differs at once from *P. scitulus* Ckll. by the black anterior legs. The dull front easily separates it from *P. nigrifrons* Ckll. Among the Smith species it seems nearest to *P. cinereus*, but not very closely allied.

#### ***Paracolletes rudis* Cockerell.**

One female: Swan River, W.A. (*J. S. Clark*). *P. rudis* was described in 1906 from a female from Swan River, received by the British Museum in 1869. It is a species with much the aspect of *P. advena* (Smith), but remarkable for the entirely dull surface of the thorax above.

#### ***Paracolletes nigroclypeatus hardyi* n. subsp.**

Female. Anterior wing 7.6 mm. Agrees in most respects with *P. nigroclypeatus* Ckll. (from Victoria), but differs especially by the black abdomen, with a different steel-blue band on each segment before the marginal depression. The clypeus is shining, with scattered irregular punctures, wholly black, but the front and sides of face are strong blue-green. The mesothorax has the disc shining, dark blue-green, and the polished sparsely punctured scutellum, with no median depression, is very decidedly green. Thus the insect presents the unusual condition of having the head and thorax more strongly metallic than the abdomen. Flagellum red beneath, especially toward the end; hair of face thin, a sort of dull pale yellowish (not white as in the typical race), of vertex black; disc of mesothorax and scutellum with short sooty hair, sides of thorax with dull greyish-white hair; tegulæ small, bright clear rufous; wings dusky; basal nervure meeting nervulus; second cubital cell receiving first recurrent at middle; third cubital receiving second recurrent almost at end; legs obscure reddish; apex of abdomen with black hair.

One female: Perth, W.A. (*G. H. Hardy*, 169). It is not surprising to find much specific and subspecific endemism in the bees of Western Australia, as according to Emily H. Pelloe, in her book on "Wild Flowers of Western Australia" (1921), there are more than 3,000 species of flowering plants peculiar to that region.

#### ***Paracolletes obscurus* Smith.**

Female: Russell Falls, National Park, Tasmania, 11-1-25. This agrees in venation with Smith's type, which I examined. It also has the characteristic dusky wings. The abdomen shows vague but quite perceptible purplish and greenish tints; Smith found the abdomen of the female black, only that of the male obscurely metallic. The clypeus is very coarsely punctured. The abdominal hair-bands are thin; not relatively white and conspicuous as in *P. advena* Sm. *P. subviridis* Ckll. is smaller and evidently different.

It is possible that Smith wrongly associated the sexes of *P. obscurus*, and that the present female belongs with his male; but at present we have no adequate grounds for such an assumption.



**Paracolletes chalybeatus** Erichson.

Female: Russell Falls, National Park, Tasmania, 9-1-25. *P. providus* Smith is very doubtfully distinct. These bees need to be collected in series, with biological observations to determine whether there are several very closely allied species. *P. chalybeatus* is the type of *Lamprocolletes* Smith, which can be distinguished from typical *Paracolletes* by the well-developed stigma. The stigma varies very much in the group, and it is rather difficult to know where to draw the line. *Leioproctus* Smith, also with well-developed stigma, has priority of place over *Lamprocolletes*. It is figured as having a very long third cubital cell, with the second recurrent joining it far from the apex; the type is the New Zealand *L. imitatus* Smith. *P. chalybeatus*, the type of *Lamprocolletes*, has the third cubital very broad but much less produced, receiving the second recurrent nervure very near the end. The longer type of cubital cell occurs also in Australian species, as for instance *P. semilucens*, described above; but it does not seem possible to regard this as a generic character.

If we separate two genera on the character of the stigma, *Paracolletes* proper will include *P. rebellis*, *P. erythrurus*, *P. nigrocinctus*, *P. callander*, *P. crassipes*, *P. latifrons*, *P. ferricornis*. *Leioproctus* will be by far the larger genus, with *waterhousei*, *helichrysi*, *sigillatus*, *thornleighensis*, *platycephalus*, *fimbriatinus*, *gallipes*, *truncatulus*, *callurus*, *andreniformis*, *halictiformis*, *advena*, *subviridis*, *fervidus* and *fervidus subdolosus*, *incanescens*, *tuberculatus* and *tuberculatus insularis*, *nitidulus*, *abnormis*, *sexmaculatus*, *ibex*, *minutus*, *obscurus*, *chalybeatus*, *leai*, *argentifrons*, *monticola*, *hudsoni*, *atronitens*, *euphenax*, *nigrofulvus*, *launcestonensis*, *providellus* and *providellus bacchalis*, *vestitus*, *castaneipes*, *metallicus*, *boltoni*, &c. It will also include the common metallic *carinatus* and *plumosus* of Smith.

**Hylæus gracilicaudus** Cockerell.

Female: King George's Sound. Close to *H. daveyi* Ckll., but tegulæ reddish, orange of postscutellum reduced; first cubital cell very long. In this specimen the first recurrent nervure meets the intercubitus.

**Hylæus perconstrictus** n. sp.

Male. Length about 9 mm.; rather robust, black; face very bright orange (but surface dull and punctured) up to level of antennæ, except the square supraclypeal area, which is entirely black; the lateral face-marks above are partly excavated by the antennal sockets, and the truncate upper end is a little produced near orbits; mandibles black, strongly bidentate; labrum with a yellow spot; scape black, ordinary; flagellum long (reaching scutellum), obscurely brownish beneath, the joints subnodose; third antennal joint partly red; tubercles and scutellum (except extreme sides) bright orange, but rest of thorax wholly black; mesothorax slightly shining, with large irregular punctures; postscutellum shining; area of metathorax short and poorly defined, somewhat shining, not evidently sculptured; pleura strongly punctured; tegulæ piceous, with an orange spot; wings clear, with black (or reddish black) stigma and nervures; second cubital cell very long, receiving first recurrent nervure very near base, second more remote from apex (in cotype the cell is shorter, and first recurrent enters extreme apex of first cubital); anterior and middle tibiæ with a pale reddish stripe in front; basitarsi pale yellowish or creamy white, the tarsi otherwise pale reddish; abdomen rugoso-punctate, first two tergites very strongly gibbous, with a deep constriction between, the elevation of the second tergite approaching the form of an obtuse keel.



Beaconsfield, Victoria (type locality), Jan. 27, 1919 (*F. E. Wilson*); Kiata, Victoria, Dec. 31, 1918 (*F. E. Wilson*). A remarkable species, known by the peculiar abdomen, lack of colour on postscutellum, and orange face with black supraclypeal area. Mr. Hacker had recognised it as probably new.

***Hylæus honestus subhonestus* n. sp.**

Male. Length about 8.5 mm.: differs from *H. honestus* (Sm.), which was described from Tasmania, as follows:—Abdomen black, with perhaps the very faintest greenish tint; anterior tibiæ very broadly yellow in front, and a dagger-like small yellow mark at apex of their femora, middle tibiæ with the outer face entirely light yellow; wings strongly brownish; scutellum with a large broadly triangular orange mark, and postscutellum with a semi-circular broad mark. Mandibles with a small yellowish mark on upper edge; labrum with a small transverse yellow spot; clypeus and lateral marks bright orange, but the surface dull; lateral marks broadly angulate in middle above (*honestus* style); supraclypeal area black; scape black; flagellum obscurely brown beneath; tubercles orange; mesothorax dull, distinctly punctured; area of metathorax rough and entirely dull, but surface on each side of it somewhat shining; basal nervure meeting nervulus; first recurrent meeting intercubitus; second cubital cell long; stigma and nervures dark; no constriction between first and second tergites; venter of abdomen quite simple; abdomen distinctly punctured.

Sheffield, Jan. 8, 1917 (*G. H. Hardy*).

***Hylæus hobartiellus* n. sp.**

Male. Length about 5.3 mm., slender, with the head broad, but the eyes strongly converging below. It is readily known from *H. hobartianus* (Ckll.) by the following characters:—Smaller; face, labrum, and mandibles light lemon yellow, the supraclypeal mark transverse, its upper edge straight; flagellum long and thick, ferruginous beneath; mesothorax, scutellum, and postscutellum shining; tubercles yellow with no black dot; wings only slightly dusky; stigma large, rufous; second recurrent nervure joining second cubital cell a little before end; coxæ in part, and trochanters entirely yellow; femora black, the anterior ones with a light apical streak; anterior and middle tibiæ pale reddish yellow, with a black mark behind; hind tibiæ black, with the basal two-fifths pale yellow; basitarsi very pale, but the small joints infuscated; abdomen narrow.

Hobart, Oct. 24, 1917 (*G. H. Hardy*).

***Hylæus wynyardensis* n. sp.**

Female. Length about or nearly 6 mm.; black, with pale-yellow markings, consisting of narrow (but not linear) lateral face markings (ending very acutely near orbital margin some distance above level of antennæ), tubercles (no other light colour on thorax), and bases of tibiæ (of the last broadly); also the anterior tibiæ are pale reddish in front; face very broad, clypeus dullish, region of ocelli dull; flagellum dusky red beneath, not extremely long; thorax shining; scutellum large and flat; tegulæ black; wings hyaline, faintly dusky; stigma very large, dark brown; basal nervure falling short of nervulus; second cubital cell about as high as long, the recurrent nervures meeting the intercubiti, or the second not quite reaching intercubitus; abdomen broad and short, moderately shining, but second segment mainly dull, its apical margin brownish; no constriction between second and third tergites.



Wynyard, Feb. 1, 1916 (*G. H. Hardy*). Runs in my key to the vicinity of *H. hobartianus* Ckll., *H. semipersonatus* Ckll., *H. scintilla* Ckll., *H. hobartiellus* Ckll., and *H. quadriceps* Sm., but I cannot place it with any of them.

***Hylæus elongatus* (Smith).**

Male: Geeveston, Dec. 24, 1914 (*G. H. Hardy*).

***Hylæus simillimus tasmani* Cockerell.**

Described from Tasmania a female from Kosciusko, Jan. 22, 1914 (*A. J. Turner*), labelled by Mr. Hacker, "near but not *P. simillima* Sm.," is so close that I cannot venture to separate it. The area of metathorax is shining, not rugose, and the orange mark on postscutellum is broadly transverse. The male might show more difference, but at present I can only recognise one form.

Two other females, distinctly larger, with the first recurrent nervure more remote from base of second cubital cell, come from Hobart, Feb. 13, 1914 (*G. H. Hardy*) and Geeveston, Dec. 25, 1914 (*G. H. Hardy*). I refrain from separating these also, as they probably indicate no more than individual variation. They agree in the area of metathorax. *H. tasmani* is probably a distinct species.

***Hylæus simillimus* Smith, var. *tasmani* n. var. or race.**

Female. Tubercles and scutellum bright yellow, axillæ black; postscutellum with a transversely oval yellow spot in middle; lateral face-marks ending in a sharp point above away from orbits; flagellum dull red beneath; vertex excessively closely and minutely punctured, and mesothorax the same, dull; area of metathorax somewhat shining, but not polished; mesopleura shining, with irregularly scattered punctures of different sizes; basal nervure practically meeting nervulus; second cubital cell large, with the recurrent nervures about equally distant from base and apex; abdomen very finely punctured above, beneath with large coarse punctures, abdomen very obscurely bluish.

Tasmania (no other particulars known). Probably a distinct subspecies, or else the female of *H. honestus* (Smith), which in the male has the yellow of scutellum also reduced.

***Hylæus longmani* n. sp.**

Male. Length about 8 mm., rather slender; black, with the face (clypeus, long supraclypeal mark, and lateral marks ending acutely above level of antennæ) creamy white; tubercles broadly (but no mark behind), scutellum, and postscutellum bright orange; antennæ long, scape with a large wedge-shaped yellow mark in front, flagellum submoniliform, clear red beneath; mandibles black; mesothorax dull, excessively densely and minutely sculptured; area of metathorax small, dull, hardly defined; pleura excessively closely and minutely punctured; tegulæ black; wings dusky hyaline; basal nervure falling short of nervulus; second cubital cell very large, receiving recurrent nervures near base and apex; under side of thorax with much silky white hair; legs black, with very short silky white hair; anterior femora with a red stripe in front, their tibiæ broad, entirely pale red on inner face; abdomen shining, finely punctured, the first segment extremely closely and finely punctured; venter with coarse punctures, the margins of the segments suffusedly reddish.

Brisbane, Oct. 21, 1921 (*H. Hacker*). Mr. Hacker had already marked it as probably new. It closely resembles *H. aureomaculatus* (Ckll.), but is easily known



by the much broader face, and the much more finely punctured first abdominal segment. I take pleasure in naming it after Heber A. Longman, the Director of the Queensland Museum, in recognition of his important services to Queensland zoology.

***Hylæus semipersonatus* n. sp.**

Male. Length about 4.5 mm.; slender, but not excessively so; black, with the face creamy white up to level of top of the long clypeus (except a narrow black mark at each side of clypeus), leaving a broad black area between the light colour and the antennæ, which are placed high up; face narrow, inner orbits convex; mandibles black with a small light spot at base, and apex reddened; labrum black; scape very broad, broadly yellowish white in front; flagellum rather long, dull red beneath; malar space well developed, longitudinally striate; ocelli in a triangle; mesothorax somewhat shining, with a deep median groove, the surface microscopically lineolate and punctured; scutellum shining; area of metathorax large, dullish; thorax all black except the tubercles apically cream colour; tegulæ dark; wings greyish hyaline; stigma unusually small, very dark reddish; basal nervure falling short of nervulus; second cubital cell receiving recurrent nervures about equally distant from base and apex; legs black, with anterior tibiæ in front, spot at base of middle tibiæ, and base of hind tibiæ broadly, creamy white; abdomen shining.

Cradle Mountain, Jan. 18, 1917 (*G. H. Hardy*). A distinct little species, easily known by the partly masked face, with dark femora and mainly black mandibles.

***Hylæus fijiensis* (Cockerell).**

In 1909 I described the splendid blue *Prosopis fijiensis* from a female in the British Museum, which had belonged to Smith. It was labelled as from the Fiji Islands. Now I find a female in the collection of the Queensland Museum, labelled Rye, Victoria, Dec. 1918 (*L. Barber*). One or the other locality must be wrong. The species seems out of place in the fauna of Victoria, and is in fact very different from anything known in Australia, with the exception of *Palæorhiza gigantea* Ckll., 1926, from Raymond Island. This is surely closely related, and should evidently stand as *Hylæus giganteus*, being wrongly referred to *Palæorhiza*. To the original description of *H. fijiensis* it should be added that the malar space is large, and the mandibles are blunt, tridentate, with the inner tooth very small.

I cannot find Raymond Island on any map. Raymond in N.S.W. is inland, not very far from Newcastle.

The large metallic species of the group of *H. fijiensis* and *H. giganteus* are so distinct from typical *Hylæus* that they may form a new subgenus *Meghylæus* with *H. giganteus* as type.

***Hylæus albonitens* (Cockerell).**

Darwin (*G. F. Hill*).

***Hylæus chromaticus* (Cockerell).**

Brookfield, Dec. 15, 1926 (*H. Hacker*).

***Hylæus perrufus* n. sp.**

Female. Length about 5.6 mm.; rather slender, thorax entirely rather dull terra-cotta red, legs clear ferruginous. Head ordinary, black; mandibles and



lower half of cheeks dull red; facial quadrangle much longer than broad; face dull orange, including the long clypeus (which is narrowly reddened at sides), long supraclypeal mark extending upward between antennæ, and lateral marks which begin to narrow at level of antennæ, but are quite broad at sides of lower half of front, and have linear extensions along orbits on upper half; labrum orange; antennæ entirely clear ferruginous, the scape long and slender; mesothorax dull; tegulæ ferruginous; wings hyaline, with large very dark stigma; basal nervure strongly curved, falling just short of nervulus; second cubital cell about square, receiving recurrent nervures very near base and apex; abdomen red as far as middle of third segment, and beyond that black; no spots or bands.

Bunya Mts., Dec. 10, 1925 (*H. Hacker*). Related to *H. hæmatopoda* Ckll., but much smaller, with wholly red thorax.

***Hylæus scintilla* (Cockerell).**

Female. Brisbane, Sept. 12, 1916 (*H. Hacker*); Logan road, at *Leptospermum*, Sept. 12. Close to *H. asperithorax* (Rayment), but smaller, with shorter head and paler stigma. The sculpture of the mesothorax resembles that of *H. asperithorax*.

***Hylæus minusculus* (Cockerell) var. a.**

Male. Caloundra, Jan. 20, 1916. It is evidently more robust than the type, and may represent a distinct species, but there is only one specimen, not in the best condition. The markings, long antennæ, and other features agree with *H. minusculus*. Compared with *H. eburniellus* (Ckll.), it is smaller, with the upward extensions of lateral face-marks longer, and slender, and the flagellum very long and slender.

***Hylæus spryi* Cockerell.**

Males from Maria Island, Jan. 1, and Triabunna, Dec. 27, both collected by G. H. Hardy. They differ from the type in having a small yellow mark on scape, and the orange mark on postscutellum is fairly large in the Triabunna specimen. As noted in the original description, this is closely related to *H. nubilosus* (Sm.). In the Triabunna specimen I can see that the tongue, though very short, is pointed. The sides of the face are more or less evidently sulcate. Thus the species is transitional toward *meroglossa*. Meade-Waldo, in his treatment of the group in *Genera Insectorum*, places *H. nubilosus* in *Palæorhiza*, but it is not close to the type of that genus. The whole group of *H. nubilosus* is evidently to be removed from *Hylæus*, but it is not precisely *Meroglossa* or *Palæorhiza*. I leave the matter for the present, to be dealt with in my work on Australian Bees.

***Gnathoprosopis amiculina* Cockerell.**

Males from Stanthorpe, Queensland, Oct. 14 and 19, 1923.

***Gnathoprosopis euxantha* Cockerell.**

Males from Brookfield, Nov. 15, 1926 (*H. Hacker*).

***Gnathoprosopis aureopicta* n. sp.**

Female. Length about 5.7 mm.; black, with bright-orange lateral face-marks (broad-cuneate, ending rather obliquely about level of antennæ), and upper border of prothorax (interrupted in middle) with tubercles also bright orange; mandibles short and very broad, black, shining; clypeus dullish; front densely



punctured; scape black; flagellum dusky red beneath; mesothorax densely and minutely punctured, the punctures not visible under a lens; base of metathorax dull and very finely sculptured, not sharply defined behind; tegulae black; wings hyaline, faintly dusky; stigma large, reddish black; basal nervure meeting nervulus, and first recurrent meeting intercubitus; legs black, the anterior tibiae partly red on inner face, and hind tibiae narrowly light yellow at base; abdomen moderately shining; venter quite simple.

Blackheath (type locality), Nov. 23 (*G. H. Hardy*); Stanthorpe, Nov. 10, 1923. Five specimens in all. This is not the female of *G. amiculina*, the female of which is known, and I am at a loss to associate it with any other male. It will be easily known by the broad-cuneate, lateral face-marks, not produced above. The interrupted prothoracic band is also characteristic, as Mr. Hacker had noted on a label attached to one of the specimens.

#### ***Palæorhiza melliceps* Cockerell.**

Two males: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*). The head of the type was apparently somewhat discoloured. In the present specimens the light markings of the head are bright yellow, except that the sides of clypeus are dark red, this colour taking the form of two dagger-shaped marks, the points upward. The mandibles are red. The species is easily known by the shining black scutellum and yellow axillæ.

#### ***Palæorhiza melanura* (Cockerell).**

Female: Kuranda, Q., 1919 (*A. P. Dodd*).

This belongs to the peculiar group in which the area of metathorax is strongly grooved or fluted. It may be regarded as a distinct subgenus: *Heterorhiza*, type *P. melanura*.

The known species are separated thus:—

- |   |       |                                     |
|---|-------|-------------------------------------|
| Abdomen in both sexes honey colour with the apex black  | .. .. | <i>melanura</i> (Ckll.)             |
| Abdomen with the ground colour dark or black  | .. .. | 1.                                  |
| 1. Thorax with two yellow lines on dorsum; abdomen black or piceous, with (male) suffused red band on first segment, a red suffusion at bases of second and third, and a pale-yellow mark on each side of second; or (female) two red spots on first segment, transverse yellow mark on each side of second, and two larger marks on third (Mackay, Q.) | .. .. | <i>denticauda</i> (Ckll.)           |
| Thorax dorsally with four yellow stripes  | .. .. | 2.                                  |
| 2. First abdominal segment with red base and two yellow marks; segments 2 and 3 each with a pair of yellow spots; antennæ red-brown (Mackay, Q.)  | .. .. | <i>longiceps</i> (Friesse) (female) |
| Abdomen without red; first segment with a broad V-shaped yellow mark on each side; segments 2 to 4 each with lateral yellow marks; antennæ dark, the scape with a yellow stripe; wings brown (Murray Island, Torres St.)  | .. .. | <i>hedleyi</i> Ckll. (male)         |

Friesse described his species under *Prosopis* in 1924. (Konowia, vol. 3.)

The type of *P. hedleyi* is in the Australian Museum, but there is also a specimen in the Queensland Museum.

*Prosopis eximius* Smith, from Batchian, Moluccas, is to be called *Palæorhiza eximia*. I examined the type in the Hope Museum at Oxford. It is a male, with abdomen appearing broadly truncate at apex, with a spine at each corner, as in



*P. hedleyi*. The second cubital cell is square; head produced into a broad snout, malar space long, abdominal segments 3 and 4 each with a pair of large round black spots.

***Palæorhiza viridifrons* Cockerell.**

Female: Dayboro, Jan. 27, 1928 (*H. Hacker*).

***Meroglossa persulcata* Cockerell.**

Nanango district, Q., Nov. 1927 (*H. Hacker*).

***Halictus leichardti* Cockerell.**

Females: Dunk Is., Q., Aug. 1927 (*H. Hacker*).

***Parasphecodes tooloomensis* n. sp.**

Female. Exactly like *P. aurantiacus* Ckll., except as follows:—Mesothorax posteriorly black, only the broad anterior portion red; area of metathorax wholly or largely black; first abdominal segment with a very broad transverse band of blackish suffusion, variably developed, but the segment never clear light red across the middle; apical part of abdomen red, not black. The wings are strongly dusky.

Eight females: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*). Perhaps to be regarded as a race of *P. aurantiacus*, but it is easily recognisable.

***Lithurgus atratiformis* Cockerell.**

Brisbane, Jan. 18, 1923 (*H. Hacker*).

***Cœlioxys reginæ* Cockerell.**

Female: Port Darwin (*H. W. Brown*).

***Cœlioxys biroi* Friese.**

Female: Rorona, Papua, May 27, 1923 (*T. K. Scheibel*). Smaller than the type, only about 10 mm. long, and the abdominal bands white, but surely not a distinct species.

***Euryglossina perpusilla* Cockerell.**

Caloundra, Jan. 20, 1916; numerous specimens, of both sexes.

***Euryglossina flaviventris* Cockerell.**

Female. Oxley, Brisbane, Sept. 24, 1914 (*H. Hacker*). Also taken Sept. 19, 1916.

***Euryglossina flaviventris* var. *fuscescens* n. var.**

Female. Lateral face-marks wholly wanting; venter of abdomen rather dark brown.

Brisbane, Sept. 10, 1915 (*H. Hacker*). I should have taken this for a distinct species, were it not that typical *E. flaviventris* occurs at Brisbane, and a second specimen taken at the same time and place as the var. *fuscescens* shows the apical two-fifths of venter orange-yellow, the colour abruptly separated from the brown. The brownish colour includes the first three sternites.

***Euryglossina flaviventris* var. *personata* n. var.**

Female. With the yellow abdominal venter and minute linear lateral face-marks of the typical form, but clypeus and supraclypeal area wholly black.

Brisbane, Sept. 10, 1915 (*H. Hacker*). Taken with var. *fuscescens*.



**Euryglossina semiflava** n. sp.

Female. Length about 3 mm.; head and thorax shining black, with the following parts clear pale yellow: mandibles, labrum, entire face to a short distance above antennæ, narrow bands along inner orbits to tops of eyes, entire cheeks (but occiput black), prothorax except middle, tubercles, and anterior part of pleura (abruptly limited); scape slender, yellow in front, flagellum stout, ferruginous beneath, legs pale yellow, hind tibiæ brown, their tarsi paler; abdomen broad, dark brown, with a faint purplish tint, first two segments with very slender but evident pale bands at apex, terminal segment pale orange, venter yellow. The mesothorax is microscopically reticulate, with very few minute punctures. Tegulæ pallid; wings hyaline, stigma bordered with fuscous; venation normal for genus; second cubital cell about as high as broad; first recurrent nervure to first intercubitus much less than (but more than half) length of intercubitus; second recurrent nervure about half as far from second intercubitus; three complete discoidal cells; lower section of basal nervure strongly arched.

Brisbane, Feb. 5, 1916 (*H. Hacker*). It was taken with *Turnerella atomaria* (Ckll.). It will be readily known by the yellow face, and sides of thorax with anterior half yellow, the rest black. In its markings, this very closely simulates *Pachyprosopis humeralis* Ckll., which is easily distinguished by the shape of the second cubital cell.

**Euryglossina hypochroma** Cockerell.

Male. Oxley, Brisbane, Sept. 24, 1914 (*H. Hacker*). This was described from Perth, W.A., but I cannot see that the Brisbane specimen differs at all.

**Euryglossina philoxantha** n. sp.

Male. Similar in appearance to *E. perpusilla* Ckll., and found with it, but easily distinguished by the fact that the face is all yellow up to the level of the antennæ (in *perpusilla* are large black wedge-shaped spaces below antennæ); the supraclypeal yellow comes to a point between the antennæ; the lateral marks fill the space between clypeus and eye, and reach to the bases of antennæ, thence narrowing (the inner edge gently convex) to the orbits; scape stout, yellow in front. As in *E. perpusilla*, the legs and tubercles are yellow, but the prothorax is also yellow right across. The abdomen is about the same, but varies to more pallid, with the sutures more or less testaceous; the abdominal venter is honey yellow, and the extreme apex dorsally is red, a feature hardly visible without the microscope. The front is microscopically tessellate. Tegulæ hyaline, with a yellow spot; wings clear, stigma and nervures dilute sepia; third discoidal cell complete; first recurrent to first intercubitus not greater than length of intercubitus, but greater than distance of second recurrent from end of second cubital cell; lower section of basal nervure strongly arched; basal nervure to nervulus hardly equal to half length of lower section of basal nervure; anterior and posterior sides of third discoidal cell parallel.

(*E. perpusilla* has first recurrent nervure reaching second cubital cell near end, the distance less than equal to half of intercubitus; and second recurrent reaching second cubital cell a little more remote from end than first recurrent from end of first cubital.)

The type specimen of *E. philoxantha* was taken at Brisbane, Oct. 1911 (*H. Hacker*); others were collected Sept. 12, 1913.



**Turnerella pachycephala** n. sp.

Female. Length about 2.8 mm.; head and thorax black, the mesothorax microscopically reticulate and very sparsely punctured; head large, quadrate, very thick, shining; mandibles pale stramineous, with black apex, which is bidentate, but only the outer tooth acute; face all black, but labrum stramineous, with long pale hairs; tegulae stramineous; wings clear, stigma pale brown, nervures colourless; marginal cell very broad (deep); first recurrent nervure joining cubital cell some distance before its end; basal nervure with lower section curved, falling far short of nervulus; two complete discoidals; legs pale yellow; antennae placed close together, the flagellum very short and stout, reddish beneath; abdomen very dark brown, nearly black, the extreme apex dull yellowish; venter dark brown, apically (more or less abruptly) stramineous.

Two females, Aug. 10, 1913 (*H. Hacker*). Readily known from the other described species by the dark abdomen and face. It differs from typical *Turnerella* in having the cubital cell extending beyond the end of the first discoidal.

**Turnerella globuliceps** (Cockerell).

Brisbane, Feb. 12, 1918 (*H. Hacker*). This was described as *Euryglossella*, but a new study of these minute bees convinces me that the latter genus should not include the three species described subsequently to the original type (*E. minima* Ckll.). The two genera may be readily separated by the venation, as follows:—

- (1.) *Euryglossella minima* Ckll. Marginal cell not so long as in *Turnerella*; no trace of upper end of second intercubitus; distance from recurrent nervure to intercubitus rather more than equal to length of intercubitus; lower section of basal nervure practically straight; distance from lower end of basal nervure to nervulus rather more than equal to length of lower section of basal nervure; no second discoidal.
- (2.) *Turnerella*, as represented by *T. globuliceps* (Ckll.), *T. nothula* (Ckll.), and *T. atomaria* (Ckll.), until now placed in *Euryglossella*. Marginal cell long and pointed, poststigmatal part much longer than substigmatal; upper end of second intercubitus present; distance from recurrent nervure to intercubitus about equal to half length of the latter; lower section of basal nervure strongly arched; distance from basal nervure to nervulus equal to about half length of lower section of basal nervure (drawn too long in Meade-Waldo's figure of *T. gilberti* Ckll.); second discoidal cell complete.

**Turnerella atomaria** (Cockerell).

Brisbane, Feb. 15, 1916; Sept. 19, 1916 (*H. Hacker*). In my original description, I failed to note that the mandibles have a large tooth beneath, near the base. The lateral face-marks may fall conspicuously short of the clypeus, or may practically reach it. The triangular yellow mark on the cheeks behind the mandibles is characteristic, but it may be small. The under side of abdomen is pale yellow.

**Turnerella atomaria** var. *fusciventris* n. var.

Female. Length hardly 3 mm.; head and thorax shining black; abdomen very dark, slightly purplish, the extreme apex dull red, the ventral surface dark brown; the following parts are reddish yellow: clypeus (the lower part dusky, and with very long outstanding pale hairs), lower part of supraclypeal area, and lateral face-



marks (consisting of narrow bands along orbits, not meeting clypeal yellow, and ending about halfway up orbits); mandibles yellow, toothed beneath near base; a small triangular yellow spot on cheeks, behind mandibles; front highly polished, convex; antennæ dark, scape black, flagellum very stout and short; tubercles entirely black; tegulæ reddish; legs reddish orange (apparently reddened by cyanide), hind tarsi dusky; wings clear, stigma with dusky margin; marginal cell long; rudiment of second intercubitus present; second discoidal complete; lower section of basal nervure strongly arched; basal nervure to nervulus about equal to half lower section of basal nervure; recurrent nervure to intercubitus less than length of intercubitus.

Brisbane, Oct. 3, 1916 (*H. Hacker*). Known by the dark abdominal venter and reduced yellow of supraclypeal area. I do not know whether it is a variation or a distinct species, but the first supposition seems more probable.

***Turnerella macrostoma* n. sp.**

Female. Length about 3.5 mm.; head and thorax shining black; abdomen broad, dark purple, the ventral surface light yellow; head very large and broad, quadrate; clypeus, triangular supraclypeal area, band-like lateral marks along inner orbits going narrowly to top of eyes, and very large patch on lowermost part of cheeks, all yellow; cheeks broad and rounded, shining; mandibles pale yellowish; antennæ pale rufo-testaceous beneath; funicle short and broad, subglobose; flagellum stout and short; prothorax very small, black, but tubercles margined with yellow; a very minute yellow spot below wings; vertex, mesothorax, and scutellum microscopically reticulate, with extremely minute very sparse punctures; metathorax short; tegulæ rufo-testaceous; wings hyaline, stigma rather light brown; lower section of basal nervure strongly arched; basal nervure to nervulus about equal to half lower section of basal nervure; no part of second intercubitus developed, but cubital nervure prolonged some distance beyond first intercubitus; recurrent nervure to intercubitus about or nearly equal to length of intercubitus; second discoidal cell complete; anterior femora stout, dark brown, their tibiae and tarsi pellucid honey colour; middle legs with base yellow, including femora, but apex of femora and all beyond, brown; hind legs yellow as far as middle of femora, and beyond that brown; claws simple; pulvilli very large; abdomen not pale at apex.

Brisbane, Queensland, Oct. 3, 1916 (*H. Hacker*). Allied to *T. atomaria*, but easily separated by the very large head, very broad in region of mouth, the yellow face-markings, and the higher clypeus, with proportionately smaller supraclypeal light area. There is a strong general resemblance to *Euryglossina hypochroma* Ckll. and *E. semipurpurea* Ckll.

***Turnerella semiflava* n. sp.**

Female. Length about 3 mm.; head and thorax above shining black, but the following parts are yellow: clypeus, supraclypeal area, lateral face-marks (broad below, and continued as narrow bands along orbits, enclosing short black facial foveæ, and ending at top of eye as an obtuse or angular projection anterior to and away from eye), mandibles, cheeks, sides of thorax (except a rather large black spot on lower part posteriorly), as well as legs and under side of abdomen; above, the abdomen is dark, slightly purplish, but more or less distinctly yellow along the sides; the extreme apex is light red, but this may be very distinct or retracted and hardly visible. Scape dark; flagellum very short and stout, bristly, somewhat yellowish beneath; claws simple; tegulæ hyaline with a yellow spot; wings clear, stigma



brown; rudiment of second intercubitus present; recurrent nervure to intercubitus less than half length of latter; basal nervure to nervulus less than half length of the arched lower section of basal nervure; second discoidal cell complete.

Brisbane, Queensland, Sept. 10, 1915 (*H. Hacker*). Readily known by the yellow cheeks and sides of thorax. Three were collected.

***Turnerella subnothula* n. sp.**

Female. A black species like *T. globuliceps*, for which I had taken it, but distinct by the following characters: front not highly polished, the surface densely minutely reticulate all over, as is also the surface of mesothorax; anterior tibiae and tarsi red, the tibiae dark brown behind; abdomen larger, with a distinct rosy or coppery tint, the apical part with scattered long white hairs. The venational characters are: upper half of second intercubitus present; second discoidal cell complete; first recurrent nervure to first intercubitus less, but not much less, than length of intercubitus; lower section of basal nervure strongly arched; basal nervure to nervulus less than half length of lower section of basal nervure. It is also very like *T. nothula*, differing thus: mandibles only dusky reddish, with dark base; face wholly black, without the narrow yellow bands along orbits, which are present in *T. nothula*; long linear facial foveae close to anterior orbits, and a row of punctures on the shining space between fovea and orbit (*T. nothula* has extremely short foveae.)

Oxley, Brisbane, Sept. 24, 1914 (*H. Hacker*).

**ZALYGUS new genus.**

Minute bees related to *Euryglossella*, but with bidentate clypeus, two discoidal cells, and simple claws. One cubital cell; two discoidals, the first with its upper side occupying only about half lower face of cubital; lower section of basal nervure very little curved; basal nervure very remote from nervulus.

***Zalygus cornutus* n. sp.**

Female. Estimated length 3 mm., but abdomen missing (it is presumably black and without salient characters); head nearly as large as thorax, quadrate, shining black, with very delicate linear sculpture, forming a very fine reticulation, and with very minute remote punctures; cheeks very broad, convex; ocelli in a broad triangle, the lateral ocelli somewhat more distant from each other than from eye; inner orbits gently concave; antennae placed low down, close together; scape long, it and the large funicle dull testaceous; flagellum short and thick, finely and quite densely hairy, very dark brown; clypeus very broad, very pale yellowish testaceous, with scattered very long erect colourless hairs, the anterior margin straight in middle, but at each side prolonged into a very large outwardly directed tooth; mandibles stout at base, tapering to apex, testaceous, the extreme tip black, the apex briefly and obtusely bidentate (seen from one direction appearing quite simple); thorax shining black, microscopically reticulate, with very widely scattered minute punctures, and almost hairless; scutellum large, convex; tegulae yellowish hyaline; wings hyaline, stigma dilute sepia, nervures nearly colourless; stigma very large; marginal cell broad (deep) but short, acutely pointed on costa, its face on costa about as long as that on stigma; one cubital cell, which is very large; upper section of basal nervure not far from vertical, lower oblique and very little curved, and not much longer; lower end of basal nervure more distant from nervulus than the equivalent of the whole lower section; two discoidal cells, the first elongate-quadrate, its face on first cubital approximately equivalent to half lower side of latter; second discoidal greatly broadened below, both ends acute; outer border of wings with



a fine delicate short fringe; legs with mainly dark coxæ, testaceous trochanters, black femora, testaceous knees, dark-brown tibiæ which are pale testaceous at apex, and pale testaceous tarsi; claws simple. The labial palpi have the terminal joint slender and very long. Although the insect is so bare of pubescence it is possible to find plumose hairs, as in all bees.

Brisbane, Queensland, Sept. 26, 1916 (*H. Hacker*).

This might be considered a subgenus of *Euryglossella*, but it seems better to regard it as a separate genus.

***Heterapis hackeriella* n. sp.**

Female. Length about 4 mm. Shining black; head rather small, rounded, about as broad as long; clypeus, supraclypeal region, labrum, and mandibles dull rufo-testaceous; sides of face black, with no pale line along orbits; antennæ rufescent beneath; tubercles pale lemon yellow; a yellow stripe along upper border of prothorax, not nearly reaching tubercles; basal area of metathorax extremely large, longer than scutellum with postscutellum, and dull, contrasting with the shining parts anterior to it; tegulæ black; wings clear, with very dark stigma; legs black, anterior tibiæ pale red in front, hind tibiæ broadly cream-colour at base; abdomen fusiform, broadest at third segment.

Brisbane (*H. Hacker*); taken (including type) Nov. 7, 1917; also Feb. 15, Sept. 19, and Oct. 3, 1916. Certain specimens (Aug. 10, 1913, and Sept. 12, 1916) have pale lines along anterior orbits; and one (Sept. 17, 1914) has a black clypeus. So far as I can see at present these represent variations. The species is nearest to *H. delicata* Ckll., but distinguished by the round head and the character of the markings. It has the peculiar hairs on anterior tarsi.

**MICRODONTURA new genus.**

Small bees related to *Euryglossina*, and perhaps only subgenerically distinct, but last abdominal sternite produced into a spine (compare *Osiris*); wings with two cubital and two discoidal cells, the third discoidal absent.

***Microdontura mellea* n. sp.**

Female. Length about 3.5 mm.; head, thorax, and the long parallel-sided abdomen dorsally light reddish brown, approaching honey colour, but more dusky; metathorax practically black, contrasting with the paler scutellum and postscutellum; ventral side of body throughout paler, the colour much lighter and clearer; face and very narrow line along anterior orbits pale yellow; labrum and mandibles testaceous, the latter black apically; eyes pale green; cheeks broad and convex, very pale, contrasting with the dark occiput; head broad, thick, quadrate; scape pale reddish, rather long and slender; funicle long-oval; flagellum short and stout, pale reddish, dusky above; mesothorax bare, microscopically transversely lineolate; area of metathorax shorter than scutellum and postscutellum together; tegulæ pale rufo-testaceous; abdomen bare, excessively minutely transversely lineolate; last ventral segment produced into a slender spine, which is bristly beneath.

Wings hyaline; stigma hyaline, with faintly dusky margin, the costal side not bristly; marginal cell long, pointed; two cubital cells, but only two discoidals; second cubital subquadrate, but narrowed above; recurrent nervure to first intercubitus a distance about equal to length of intercubitus; lower section of basal nervure strongly arched; basal nervure to nervulus equal to less than half lower section of basal nervure.

Brisbane, March, 7, 1918 (*H. Hacker*).



***Halictus musicus* Cockerell.**

Tooloom, Jan. 26 (*Hacker*).

***Halictus repertulus* Cockerell.**

Brisbane, Nov. 19, 1913, and Sept. 25, 1919 (*Hacker*).

***Halictus mesembryanthemi* Cockerell.**

Brisbane, Nov. 20, 1917 (*Hacker*). I am surprised to see it from so far north.

***Halictus semipolitus* Cockerell.**

Tambourine Mountain, at flowers of *Helichrysum bracteatum*, Oct. 27, 1912 (*Hacker*); Bribie I., Jan. 1917 (*Hacker*); Brisbane, Sept. 20, 1916 (*Hacker*).

***Halictus lanarius* Smith.**

Adaminaby, N.S.W., Oct. 19, 1918.

***Halictus griseovittatus* Cockerell.**

Brisbane, Oct. 24, 1916 (*Hacker*); Sunnybank, at *Leptospermum*.

***Halictus helichrysi* Cockerell.**

Tambourine Mountain, Dec. 28, 1911 (*Hacker*).

***Halictus orbatus* Smith.**

Brisbane, Sept. 9, 1912 (*Hacker*); Stanthorpe, Sept. 19, 1922, at fruit blossoms; Tooloom, N.S.W., Jan. 1926 (*Hacker*). The Tooloom specimens have more distinct abdominal bands, and one of the Stanthorpe ones has the mesothorax rougher, but I believe that all (♀) belong to the same species. However, Australian collectors should obtain the males, and see if possibly *H. orbatus*, as now understood, is composite.

***Parasphecodes atronitens* Cockerell.**

Nanango District, Queensland, Nov. 1927 (*Hacker*).





Cockerell, Theodore D. A. 1929. "Bees in the Queensland Museum." *Memoirs of the Queensland Museum* 9, 298–323.

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