

base, and without erect hairs; ventral scopa short and compact, pure white, black on last segment.

Hab. Trinity, Texas, Aug. 30, 1906, two (*F. C. Bishopp*). U.S. National Museum.

M. occidentalis, Fox, has the mesothorax much more finely punctured, and the last dorsal segment with a deep transverse subapical groove, represented only by a transverse depression in *penicillata*.

Bombus rufocinctus, var. *castoris*, v. n.

Bombus rufocinctus, Cress., var. 6, Franklin, Trans. Amer. Ent. Soc. xxxviii. p. 443.

♂.—Abdomen with yellowish-fulvous hair on first two dorsal segments, black on all the others.

Hab. Beaver Creek, Montana, 6300 ft., Aug. 1913 (*S. J. Hunter*). The abdomen is coloured as in the male of *B. vagans*, Smith. There is much yellow hair on the head above, and a large yellow patch in the middle of the face.

XLVIII.—*Notes on Fossorial Hymenoptera*.—XVI.

By ROWLAND E. TURNER, F.Z.S., F.E.S.

On the Thynnidæ, Scoliidæ, and Crabronidæ of Tasmania.

THE following list includes all the known species of Thynnidæ, Scoliidæ, and Crabronidæ occurring in Tasmania. I have already published notes on the Mutillidæ of the island (*Ann. & Mag. Nat. Hist.* (8) xiv. pp. 429-450), and hope at a future date to give a list of the Psammocharidæ. I have not included the few species known from the islands in Bass Straits, which are politically part of Tasmania. The fossorial Hymenoptera are not very numerous in Tasmania, and a considerable number are common to Australia and Tasmania, the resemblance to the fauna of the mountainous districts of S.E. Australia being very marked. The absence of the conspicuous coloration of broad orange bands, so characteristic of Australia, is remarkable; I am not aware that this plan of colour occurs among the wasps of Tasmania, except in one or two strong-flying Psammocharidæ which have doubtless found their way across from the mainland. In one case, *Crabro tridentatus*, Sm., which occurs in Victoria, has broad orange bands on the abdomen; the Tasmanian form, *C. tasmanicus*, Sm., has narrow yellow bands, but does not differ appreciably in structure.

Family *Thynnidae*.Subfamily *DIAMMINÆ*.*Diamma bicolor*, Westw.*Diamma bicolor*, Westw. Proc. Zool. Soc. London, iii. p. 53 (1835). ♀.*Psammatha chalybea*, Shuck. Trans. Ent. Soc. London, ii. 1, p. 69 (1837). ♂.*Tachypterus fasciatus*, Guér. Voy. Coq., Zool. ii. 2, p. 217 (1839). ♂.

Not uncommon in Northern Tasmania, but I did not take specimens in the south. Also common in the south-eastern portions of Australia from Adelaide to Sydney.

Subfamily *RHAGIGASTERINÆ*, Ashm.*Rhagigaster pugionatus*, Sauss.*Rhagigaster pugionatus*, Sauss. Reise Nov. Zool. ii., Hym. p. 113 (1867); Turn. Proc. Linn. Soc. N.S.W. xxxii. p. 234 (1907). ♀.

Common on *Leptospermum* blossom at Eaglehawk Neck in February. I have had a specimen of this species from Cumberland, N.S.W., but it is certainly not common on the mainland. I do not know that any other species of the genus occurs in Tasmania, though forms of *R. unicolor*, Guér., are so plentiful on the mainland. Westwood, however, mentions a specimen of *R. unicolor* sent to him as coming from Tasmania. I therefore include it as Tasmanian, though with doubt.

Rhagigaster unicolor, Guér.*Rhagigaster unicolor*, Guér. Voy. Coq., Zool. ii. 2, p. 214 (1839). ♂.*Rhagigaster binotatus*, Westw. Arc. Ent. ii. p. 105 (1844). ♀.

If any form of this occurs in Tasmania, it would probably be the Victorian subspecies *lyelli*, Turn.

Genus *EIRONE*, Westw.*Key to the Tasmanian Species.*

♂ ♂.

- | | |
|---|---------------------------|
| 1. Clypeus without an apical depression or triangular truncation; legs black | 2. |
| Clypeus with an apical depression or triangular truncation; legs ferruginous or bright testaceous brown | 3. |
| 2. Pronotum entirely black | <i>E. dispar</i> , Westw. |

- Anterior and posterior margins of the pronotum narrowly white *E. exilis*, Turn.
3. Pronotum and abdomen black *E. lucida*, Sm.
- Pronotum marked with yellow on the anterior margin at least; abdomen bright ferruginous, sometimes more or less clouded with black 4.
4. Antennæ yellow from the middle of the ninth joint of the flagellum to the middle of the twelfth *E. celsissima*, Turn.
- Antennæ black or ferruginous 5.
5. Antennæ ferruginous; apical depression of clypeus arcuate *E. leai*, Turn.
- Antennæ black; clypeus with a triangular surface from before the middle . *E. ichneumoniformis*, Sm.

♀ ♀.

- First abdominal segment not narrowed to the base; sixth dorsal segment with a carina *E. dispar*, Westw.
- First abdominal segment narrowed to the base; sixth dorsal segment without a carina *E. celsissima*, Turn.

Eirone exilis, sp. n.

♂. Black; the mandibles (except at the apex), the anterior and posterior margins of the pronotum narrowly, a spot on the tegulæ, the fore tibiæ in front, and a spot at the base of the intermediate and hind tibiæ white. Wings hyaline, iridescent, nervures fusco-ferruginous. A small spot on each side above the base of the antennæ white. Clypeus slightly emarginate at the apex, with a carina from the base not quite reaching the apex. Head finely and closely punctured, a deep oval depression in the middle of the front, above the interantennal prominence. Thorax closely punctured, most finely on the pronotum, scutellum very broadly rounded at the apex; median segment rounded, shining and sparsely punctured at the base, more closely elsewhere. Abdomen shining, sparsely and very shallowly punctured, the segments not depressed at the base, the apical dorsal segment more deeply punctured and narrowly rounded at the apex. Second abscissa of the radius as long as the third, the second recurrent nervure received just before the middle of the third cubital cell.

Length 8 mm.

Hab. Eaglehawk Neck, S.E. Tasmania; February.

This is allied to *inconspicua*, Turn., and less closely to *parca*, Turn., and *montivaga*, Turn., but differs from all of them in the carinated clypeus as well as in colour.

Eirone dispar, Westw.

Eirone dispar, Westw. Arc. Ent. ii. p. 144 (1844). ♂ ♀.

? *Thynnus* (*Agriomyia*) *brevicornis*, Sm. Cat. Hym. B.M. vii. p. 39 (1859). ♂.

Common on *Leptospermum* blossom in February at Eaglehawk Neck. Westwood's specimens were from Adelaide, but I do not think there is any specific difference.

Eirone ichneumoniformis, Sm.

Thynnus (*Agriomyia*) *ichneumoniformis*, Sm. Cat. Hym. B.M. vii. p. 39 (1859). ♂.

Eirone (*Lepteirone*) *ichneumoniformis*, Turn. Proc. Linn. Soc. N.S.W. xxxii. p. 252 (1907). ♂ ♀.

Hab. Hobart (*Lea*). Also from Victoria.

The triangular area on the clypeus does not quite extend to the apex, as stated in my description of the species, the apex being narrowly transversely depressed.

Eirone celsissima, Turn.

Eirone celsissima, Turn. Proc. Linn. Soc. N.S.W. xxxviii. p. 609 (1914). ♂ ♀.

The male is easily recognized by the yellow colour of the four apical joints of the antennæ. It is much larger than the other Tasmanian species of the genus.

Hab. Mt. Wellington, 2200 ft.; January to March. Waratah (*Lea*).

Eirone lucida, Sm.

Thynnus (*Agriomyia*) *lucidus*, Sm. Cat. Hym. B.M. vii. p. 36 (1859). ♂.

The female is unknown, but probably resembles that of the closely allied form *E. lucidula*, Turn., which represents the present species on the mainland.

Hab. Eaglehawk Neck; February.

Eirone leai, sp. n.

♂. Black; the mandibles (except at the apex), clypeus, a line on each side on the anterior margin of the pronotum, and a spot at the apex of the anterior tibiæ yellow; the antennæ (except the three apical joints), a line on the inner margin of the eyes, the legs (except the coxæ), and the abdomen rufo-ferruginous; tegulæ fusco-testaceous; wings subhyaline, nervures fuscous.

Length 8-12 mm.

♂. Clypeus broad, with a broadly arched carina near the

middle, the apical portion below the carina strongly depressed and subconcave, truncate at the apex. Antennæ long, as long as the head, thorax, and median segment combined, the apical joints arcuate beneath; interantennal prominence bilobed. Head not much produced or narrowed behind the eyes; the posterior ocelli as far from the eyes as from the posterior margin of the head. Finely and closely punctured, most finely on the median segment; abdomen elongate-fusiform, sparsely punctured. Hypopygium small, rounded at the apex, and ciliated. Third abscissa of the radius shorter than the second by about one-fifth, second recurrent nervure received just before the middle of the third cubital cell.

Hab. Waratah, N.W. Tasmania (*Lea*).

Described from four males.

This is nearest to *E. rufopicta*, Sm., but in that species the clypeus is longitudinally carinate before the apical depression. The clypeus also distinguishes it from *caroli*, Turn., and other allied species.

Subfamily *THYNNINÆ*.

Ariphron bicolor, Erichs.

Ariphron bicolor, Erichs. Arch. f. Naturgesch. viii. p. 264, t. v. fig. 1 (1842). ♀.

Ariphron rigidulus, Turn. Proc. Linn. Soc. N.S.W. xxxii. p. 274 (1907). ♂.

Hab. Eaglehawk Neck; February. Also from Victoria.

The female seems scarce, and I did not take it. From the localities in which I took the males I suspect that the females may associate with ants of the genus *Myrmecia*.

Tachynomyia abdominalis, Guér.

Agriomyia (*Tachynomyia*) *abdominalis*, Guér. Mag. de Zool. xii. p. 5 (1842). ♂.

Var. *Agriomyia* (*Tachynomyia*) *spinolæ*, Guér. Mag. de Zool. xii. p. 6 (1842). ♂.

Thynnus fervidus, Erichs. Arch. f. Naturges. viii. p. 263 (1842). ♂.

Tachynomyia abdominalis, Turn. Proc. Linn. Soc. N.S.W. xxxii. p. 279 (1907). ♂ ♀.

Hab. Mt. Wellington, 2200 ft.; January. Also from Victoria.

As far as I am aware, no other species of *Tachynomyia* occurs in Tasmania, though several are found in Victoria. The female is distinguished by the sculpture of the second dorsal segment, which is without the transverse rugæ usual in the genus.

Genus PHYMATOTHYNNUS, Turn.

Key to the Tasmanian Species.

♂ ♂.

Tibiæ and tarsi ferruginous; mandibles, apex of clypeus, lines on pronotum and on post-scutellum yellow	<i>P. derelictus</i> , Turn.
Entirely black	<i>P. monilicornis</i> , Sm.

♀ ♀.

Pronotum much longer than wide, not subcarinate in the middle posteriorly.....	<i>P. derelictus</i> , Turn.
Pronotum only a little longer than broad, subcarinate in the middle on the posterior half	<i>P. monilicornis</i> , Sm.

Phymatothygnus monilicornis, Sm.

Thynnus (*Agriomyia*) *monilicornis*, Sm. Cat. Hym. B.M. vii. p. 39 (1859). ♂ ♀.

This was described from Victoria, but there is a pair in the British Museum from Tasmania sent by Mr. A. Simson probably from the Launceston district. I did not see the species in Southern Tasmania.

Phymatothygnus derelictus, sp. n.

♂. Black, with light fulvous pubescence; the mandibles (except at the apex), the apical margin of the clypeus broadly, the margin of the interantennal prominence narrowly, a line on each side on the anterior margin of the pronotum, and a spot on the postscutellum pale yellow; tegulæ testaceous; the tibiæ, tarsi, and the apex of the femora ferruginous. Clypeus convex, without a distinct carina, produced and very narrowly truncate at the apex. Head finely and very closely punctured, the interantennal prominence fairly well developed and very broadly rounded at the apex, a short and shallow longitudinal sulcus on the front. Thorax and median segment finely and closely punctured; abdomen shining and very shallowly punctured, flattened, the segments very slightly constricted at the base, the basal segment slender, very narrow at the base, half as broad at the apex as the apex of the second segment. Hypopygium longer than broad, very slightly widened from the base, tridentate at the apex, the central tooth long, the lateral ones short but distinct. Wings subhyaline, nervures fuscous; second recurrent nervure received just before one-fourth from the base of the third cubital cell.

Length 12 mm.

♀. Fusco-ferruginous, more or less stained with black, especially on the apical abdominal segments.

Head closely and not very finely punctured, broader anteriorly than long, much narrowed posteriorly, the antennæ inserted far apart, the front produced between them and subtuberculate on each side. Pronotum convex, distinctly margined laterally, nearly half as long again as the greatest breadth; scutellum longer than broad; dorsal surface of the median segment about half as long as the pronotum, very sparsely punctured. Second dorsal segment coarsely transversely rugulose, with a transverse carina near the base and another at the apex; the dorsal segments punctured, more closely on the apical segments. Sixth dorsal segment with a carina from the base almost reaching the apex, not compressed, rounded at the apex, the edges of the ventral segment produced upwards and forming marginal carinæ along the apical half of the dorsal segment.

Length 9 mm.

Hab. Eaglehawk Neck; February. Fern-tree, Mt. Wellington; January.

Both sexes are very near *P. monilicornis*, but the male differs in the presence of yellow markings, in the colour of the legs, in the absence of a carina at the base of the clypeus, and in the greater development of the spines on the hypopygium. The female differs in the longer pronotum, which is also subcarinate longitudinally on the posterior half in *monilicornis*, also in the margins of the sixth ventral segment. These differences I think are specific, though the species are very closely related.

Psammothynnus depressus, Westw.

Thynnus (*Agriomyia*) *depressus*, Westw. Arc. Ent. ii. p. 107 (1844).
♂ ♀.

There is a specimen of this species in the British Museum taken by Commander Walker at Hobart. The type was taken at Albany, W.A.

Genus ASTHENOTHYNNUS, Turn.

Key to the Tasmanian Species.

♂ ♂.

Legs and abdomen black marked with pale yellow; hypopygium slightly broadened from the base and truncate at the apex, with a median spine *A. westwoodi*, Guér.

Legs and usually abdomen also bright rufo-testaceous; hypopygium gradually produced into a long spine *A. maritimus*, Turn.

♀ ♀.

Anterior margin of the pronotum not raised; the elevated portion of the first dorsal segment before the depressed apical margin with a distinct median emargination *A. westwoodi*, Guér.

Anterior margin of the pronotum raised, forming a marginal carina; elevated portion of first dorsal segment not emarginate, almost straight on the posterior margin *A. maritimus*, Turn.

Asthenothynnus westwoodi, Guér.

Agriomyia westwoodi, Guér. Mag. de Zool. p. 4 (1842). ♂.

Thynnus intricatus, Sm. Cat. Hym. B.M. vii. p. 30 (1859). ♂.

Thynnus longiceps, Sm. Cat. Hym. B.M. vii. p. 46 (1859). ♀.

Thynnus nanus, Sm. Descr. New Sp. Hym. p. 171 (1879). ♂.

Hab. Ferntree, Mt. Wellington; January. Eaglehawk Neck; February. Also from Victoria and New South Wales.

This is a common Tasmanian species. Guérin's type was from Tasmania, also the types of *intricatus* and *longiceps*. The type of *nanus* also came from Tasmania.

Asthenothynnus maritimus, sp. n.

♂. Black; legs (except the coxæ) and abdomen (except the base of the first segment) bright rufo-testaceous; mandibles, anterior margin of the clypeus, inner margin of the eyes, margins of the pronotum, a large spot on the mesopleuræ, a spot on the tegulæ and a curved line above them, a small spot on the posterior margin of the mesonotum, a longitudinal mark on the scutellum, a transverse band on the postscutellum, and a spot on the sides of the median segment near the apex yellow; a spot on each side on the vertex near the summit of the eyes dull ferruginous red.

Head and thorax closely and finely punctured, clypeus with a short longitudinal carina from the base, the inter-antennal prominence only slightly developed, a very shallow groove on the front not reaching the anterior ocellus. Median segment with a shallow groove from the base not reaching the apex. Abdomen slender and somewhat flattened, the first segment much longer than the second, very slender at the base, the second at the apex half as broad again as the apex of the first. Sides of the hypopygium gradually convergent to the median spine. Wings hyaline, the third

abscissa of the radius a little longer than the second; the third cubital cell receives the second recurrent nervure at one-quarter from the base.

Length 10 mm.

♀. Blackish brown; mandibles, antennæ, and legs paler brown; pygidium reddish brown. Head shining, smooth, much narrowed posteriorly, nearly twice as broad anteriorly as posteriorly, clypeus without a carina; a very short and shallow frontal sulcus. Pronotum as long as broad, slightly narrowed posteriorly, the anterior and lateral margins distinctly raised, a median sulcus nearly reaching the posterior margin. Scutellum a little longer than broad, rounded at the apex. Abdomen sparsely punctured, the first dorsal segment narrowly depressed at the apex, the raised portion before the depression straight, not emarginate. Second dorsal segment with three strongly raised transverse carinæ, the apical margin also slightly raised, forming another lower carina. Pygidium elongate-ovate, the dorsal plate truncate at the apex and not reaching to the apex of the ventral segment.

Length 8 mm.

Hab. Eaglehawk Neck; February. ♂ ♀ *in cop.* Swansea (*Lea*).

A male from Eaglehawk Neck has the abdomen, except the seventh segment and the apex of the sixth, blackish brown.

Genus NEOZELEBORIA, Rohwer.

Key to the Tasmanian Species.

♂ ♂.

- | | |
|---|--------------------------------|
| Hypopygium narrowly truncate at the base of the apical spine; abdomen with lateral yellow spots | <i>N. proxima</i> , Turn. |
| Hypopygium rounded at the base of the apical spine; abdomen black, immaculate | <i>N. carinicornis</i> , Turn. |

♀ ♀.

- | | |
|--|--------------------------------|
| Pronotum flat, with a sulcus from the anterior margin to the middle | <i>N. proxima</i> , Turn. |
| Pronotum strongly elevated along the median line, the elevation broadened anteriorly; without a sulcus | <i>N. carinicornis</i> , Turn. |

Neozeleboria carinicornis, sp. n.

♀. Head fully half as broad again as long, very strongly rounded at the posterior angles, shining, sparsely punctured,
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with a short frontal sulcus. Pronotum narrower than the head, as long as broad, raised along the median line into a strongly elevated carina, which broadens to the anterior margin; the dorsal surface on each side of the carina slightly concave. Scutellum strongly rounded at the apex, nearly as long as broad; dorsal surface of the median segment more than half as long as the pronotum. Thorax and abdomen subopaque, finely and very closely punctured; first dorsal segment with a transverse groove before the raised apical margin; second dorsal segment with five strongly raised carinae, including the raised apical margin; sixth dorsal segment elongate-ovate, with a median carina, not compressed laterally.

Black; the head ferruginous; flagellum and legs testaceous brown, second and sixth dorsal segments and all the ventral segments dark ferruginous.

Length 7-9 mm.

♂. Black; the mandibles (except at the apex), a transverse line (interrupted in the middle) on the anterior margin of the pronotum, and a spot on the postscutellum (sometimes almost obsolete) pale yellow. Wings hyaline, nervures fuscous.

Clypeus slightly convex, a little advanced in the middle and truncate broadly at the apex; interantennal prominence not much developed, only showing as a tubercle above the base of each antenna. Head and thorax closely punctured and thinly clothed with long grey pubescence; antennae longer than the thorax and median segment combined. Abdomen shining, fusiform, the segments not constricted; hypopygium linguiform, rounded at the apex, with a small apical spine. Third abscissa of the radius nearly half as long again as the second; second recurrent nervure received at about one-quarter from the base of the third cubital cell.

Length 10-12 mm.

Hab. Hobart (*Lea*).

The pronotum of the female is very different to other species of the genus, in which a longitudinal sulcus is always present and no carina; but otherwise there is no remarkable difference. The sexes are not marked as taken coupled, but I have no doubt of the association. The female is the type.

Neozeleboria proxima, Turn.

Thynnus (*Zeleboria*) *proximus*, Turn. Proc. Linn. Soc. N.S.W. xxxiii. p. 99 (1908). ♂ ♀.

Hab. Leura, N.S.W. Eaglehawk Neck; February

A common species. As in some other forms, this species ranges into the mountain-districts of S.E. Australia.

Agriomyia odyneroides, Westw.

Thynnus (*Agriomyia*) *odyneroides*, Westw. Arc. Ent. ii. p. 109 (1844).
♂ ♀.

Hab. Hobart (*J. J. Walker*).

This is very near *A. maculata*, Guér., but differs in the shape of the head and pronotum in the female, as well as in the markings on the median segment in the male. It must therefore be regarded as distinct, and not as a mere variety. The males in *Agriomyia* are very difficult to separate when the females are not available, owing to the want of good structural differences, and until we have long series it is not well to depend too much on colour-distinctions. Unfortunately species of this group are not taken coupled nearly so frequently as most Thynnidae.

Westwood does not give any locality for *odyneroides*, but most of the specimens I have seen are Tasmanian. There are also males in the British Museum from Adelaide, from Jindabyne, N.S.W., 3000 ft., and from "Moreton Bay." All these have the third abscissa of the radius distinctly longer than in Tasmanian specimens.

Thynnoturneria decipiens, Westw.

Thynnus decipiens, Westw. Arc. Ent. ii. p. 105 (note), p. 124 (1844).
♂.

Hab. Hobart (*J. J. Walker*).

Tmesothynnus humilis, Erichs.

Thynnus humilis, Erichs. Arch. f. Naturges. viii. p. 264 (1842). ♀.

♂. Black; a spot at the base of the mandibles, the lateral and apical margins of the clypeus narrowly, a line on each side at the anterior angles of the pronotum, a spot on the tegulæ, and a line on the postscutellum pale whitish yellow; the posterior margin of the pronotum luteous. Clypeus convex, smooth at the apex; head and thorax finely and very closely punctured, the interantennal prominence only slightly developed; scutellum strongly convex. Median segment rounded, shining at the base, finely punctured. Abdomen sparsely punctured, shining, the segments strongly constricted at the base, the apical segment strongly punctured, the apical

margin raised and slightly produced in the middle; hypopygium tridentate, the lateral teeth short, the margin between them almost straight except where produced into the long apical spine. Wings hyaline, nervures blackish. Second recurrent nervure received by the third cubital cell at a distance from the base equal to a little more than one-third of the length of the second transverse cubital nervure.

Length 9 mm.

Hab. Eaglehawk Neck; February. Hobart.

A variety of the female has the head red. The continental form of this species seems to be *T. truncatus*, Sm., but in that species the clypeus is less convex and more strongly punctured at the apex; the three spines of the hypopygium are much less developed, the lateral ones being almost obsolete, the apical dorsal segment is not produced in the middle of the apical margin, and the abdomen is more closely punctured. Females taken at Eaglehawk Neck have the head less punctured than would be expected from Erichson's description, but I think my identification is correct. A female from Hobart has the head red.

Hemithynnus olivieri, Erichs.

Thynnus olivieri, Erichs. Arch. f. Naturges. viii. p. 262 (1842). ♂ ♀.

Thynnus hyalinatus, Westw. Arc. Ent. ii. p. 106 (1844). ♂ ♀.

This species is also found in the mountainous regions of S.E. Australia.

The name *olivieri* has priority, and should be used in preference to *hyalinatus*. Erichson gives *apterus*, Oliv., as the name for the female of his species, but I think that name should apply to the female of *variabilis*, Kirby. This species is very close to *apterus*, which is so common in S.E. Australia, and may prove to be only a cool-climate form of that species; but I think it is distinct.

Lophocheilus niger, Sm.

? *Lophocheilus villosus*, Guér. Mag. de Zool. xii. p. 12 (1842). ♂.

Thynnus niger, Sm. Cat. Hym. B.M. vii. p. 30 (1859). ♂.

Lophocheilus villosus, Turn. Proc. Linn. Soc. N.S.W. xxxiii. p. 169 (1908). ♂ ♀.

Hab. Huon River (*Lea*). Eaglehawk Neck; February.

This species seems to be confined to Tasmania, where it is quite plentiful. It is represented in Victoria by an allied species, *L. anilitatis*, Sm. I am not at all sure that I was right in sinking Smith's name as a synonym of *villosus*,

Guér., and, as I have not seen Guérin's type, perhaps it is better to use Smith's name pending further information.

Thynnoides senilis, Erichs.

Thynnus senilis, Erichs. Arch. f. Naturges. viii. p. 263 (1842). ♂.

I have not seen this species from Tasmania, but I have received Victorian specimens answering to Erichson's description. I have no doubt that his record of the species as Tasmanian is quite correct.

Family Scoliidæ.

Subfamily *ANTHOBOSCINÆ*, Turn.

Anthobosca flavicornis, Sauss.

Cosila (*Callosila*) *flavicornis*, Sauss., Grandidier, Hist. Madagascar, xx. p. 233 (1892). ♀.

One female from Tasmania in the British Museum collection has the tibiæ fulvous, not black as in the typical Australian form. It is also more sparsely punctured. Easily distinguished by the orange-yellow antennæ.

Anthobosca confusa, sp. n.

♀. Black, with sparse white pubescence, the spines of the tarsi testaceous brown. Wings hyaline, nervures black.

Clypeus shining, sparsely punctured, raised in the middle into a smooth longitudinal carina, which is broadened towards the apex. Head shining, sparsely punctured, almost as sparsely and finely on the front as on the vertex, no pubescence on the front. Thorax shining, very sparsely punctured, median segment shining, very minutely punctured. Abdomen shining, very shallowly and finely punctured, with sparse larger punctures. Sixth dorsal segment opaque, rather strongly punctured at the base, very minutely in the middle, the apical margin smooth and testaceous. The apical portion of the hind femora beneath is strongly rounded and broad, but there is no well-defined apical lobe. Radial cell broadly rounded at the apex, almost truncate; second abscissa of the radius scarcely longer than the first, the third longer than the first and second combined. First recurrent nervure received before the middle of the second cubital cell, second just before the middle of the third cubital cell. Tarsal ungues with a blunt basal lobe.

Length 7-12 mm.

♂. Opaque black; mandibles at the base, clypeus, posterior margin of the pronotum, tegulæ, a transverse spot on the postscutellum, and the tibiæ in front pale yellow; calcaria whitish. Wings hyaline, iridescent, nervures black.

Clypeus broad, almost transverse at the apex. Antennæ stout, a little shorter than the thorax and median segment combined. First abdominal segment distinctly, though only slightly, longer than the second, longer than its apical breadth, gradually widened from the base. Third abscissa of the radius as long as the first and second combined, the second longer than the first. The second recurrent nervure is received at two-fifths from the base of the third cubital cell, the first at the middle of the second cubital cell.

Length 6 mm.

Hab. Eaglehawk Neck; February. Mt. Wellington, 1300 ft.; January. Ulverstone (*Lea*).

Somewhat intermediate in the female between *unicolor*, Sm., and *lævifrons*, Sm. From *unicolor* it differs in the absence of the strong puncturation of the front and the long hairs rising therefrom, also in the position of the second recurrent nervure; from *lævifrons* in the puncturation of the head, in the broadening of the carina of the clypeus, in the absence of ferruginous colour on the mandibles and antennæ; and from both in the lesser development of the lobe at the apex of the hind femora.

The male differs from *frenchi*, Turn., in the longer first abdominal segment and the yellow clypeus, and from *lagardei*, Turn., in the same manner as to the first segment and also in the absence of yellow markings on the seventh dorsal segment.

My record of *unicolor*, Sm., from Tasmania (Proc. Zool. Soc. London, p. 734, 1912), applied to this species, but further material has convinced me that it is distinct.

The female is the type.

Scolia (Dielis) tasmaniensis, Sauss.

Elis tasmaniensis, Sauss. Mem. soc. phys. & hist. nat. Genève, xiv. p. 61 (1854). ♀.

Elis (Dielis) formosa, Sauss. et Sich. Cat. Sp. Gen. *Scolia*, p. 209 (1864). ♂ ♀; Turn. Ann. & Mag. Nat. Hist. (8) iv. p. 178 (1909) (nec Guérin).

I have not seen specimens of this common Australian species from Tasmania, but have no reason to doubt Saussure's record. It has usually been known under the name *formosa*, Guér., which is quite a different species, which does not range south of Cairns in North Queensland.

Family *Crabronidæ*.

Subfamily *PEMPHREDONINÆ*.

Spilomena hobartia, Turn.

Spilomena hobartia, Turn. Proc. Linn. Soc. N.S.W. xxxviii. p. 622 (1914). ♀.

Hab. Eaglehawk Neck; March.

Taken on dead *Eucalyptus*-trees in which old beetle-holes were numerous. Doubtless this little wasp makes its nests in these abandoned holes.

Subfamily *SPHECINÆ*.

Chlorion (Harpactopus) globosus, Sm.

Sphex globosus, Sm. Cat. Hym. B.M. iv. p. 251 (1856). ♂ ♀.

Harpactopus australis, Sauss. Reise 'Novara,' Zool. ii. p. 42 (1867).

Hab. Hobart (*Walker*).

I have taken this species as far north as Cooktown and also at Yallingup and Kalamunda in S.W. Australia. It probably ranges over the whole continent.

Chlorion (Isodontia) obscurellus, Sm.

Sphex obscurella, Sm. Cat. Hym. B.M. iv. p. 251 (1856). ♂ ♀.

Hab. Hobart (*Walker*).

This is very near the wide-ranging *nigellus*, Sm., but has the petiole distinctly shorter.

Sphex (Psammophila) suspiciosa, Sm.

Ammophila suspiciosa, Sm. Cat. Hym. B.M. iv. p. 214 (1856). ♀ ♂.

I have seen Tasmanian specimens of this species. It has a wide range in the southern and interior districts of Australia.

Subfamily *BEMBECINÆ*.

Bembex furcata, Erichs.

Bembex furcata, Erichs. Arch. f. Naturges. viii. p. 266 (1842). ♂ ♀.

Hab. Eaglehawk Neck; February. Launceston (*Simson*).

This species ranges over the whole southern portion of Australia from Sydney to Perth. It appears to be uncommon in the west. No other species of the genus occurs in Tasmania.

Subfamily *PARANYSSONINÆ*.*Sphodrotes punctuosus*, Kohl.

Sphodrotes punctuosus, Kohl, Ann. natur. Hofmus. Wien, iv. p. 189 (1889). ♂.

A single male taken in February on *Leptospermum*-blossom at Eaglehawk Neck. Kohl described the species from New South Wales, and I have seen specimens of the male from Mt. Kosciusko in the Australian Museum, but no female.

Sericophorus chalybæus, Sm.

Sericophorus chalybæus, Sm. Ann. & Mag. Nat. Hist. (2) vii. p. 32 (1851). ♀.

Tachyrrhostus cyaneus, Sauss. Mem. soc. phys. & hist. nat. Genève, xiv. p. 1 (1854). ♀.

Hab. Eaglehawk Neck; February.

Four females taken burrowing in sand.

Zoyphium iridipenne, Turn.

Zoyphium iridipenne, Turn. Ann. & Mag. Nat. Hist. (8) xiv. p. 356 (1914). ♀.

Hab. Eaglehawk Neck; February.

On *Leptospermum*-blossom.

Subfamily *CRABRONINÆ*.*Crabro* (*Solenius*) *tasmanicus*, Sm.

Crabro tasmanicus, Sm. Cat. Hym. B.M. iv. p. 425 (1856). ♀.

Hab. Ferntree, 1300 ft.

A pair taken on *Leptospermum*-blossom in January.

Genus *RHOPALUM*, Kirby.*Key to the Tasmanian Species.*

♀ ♀.

- | | |
|---|------------------------------|
| 1. First abdominal segment shorter than the second; black, the trochanters yellow; length 5-6 mm..... | <i>R. frenchii</i> , Turn. |
| First abdominal segment as long as or longer than the second; trochanters black; length over 6 mm. | 2. |
| 2. Hind tibiæ distinctly spinose | 3. |
| Hind tibiæ not spinose | <i>R. eucalypti</i> , Turn. |
| 3. Three basal segments of abdomen bright red, tibiæ and tarsi yellow | <i>R. tricolor</i> , Sm. |
| Abdomen wholly black, tarsi more or less yellow, fore tibiæ only yellow on the outside . | <i>R. varietarse</i> , Turn. |

Rhopalum frenchii, Turn.

Crabro (*Rhopalum*) *frenchii*, Turn. Proc. Zool. Soc. London, p. 526 (1908). ♀.

Hab. Mt. Wellington, 2300 ft.; January to April. Eaglehawk Neck; February. Also from Victoria and S.W. Australia.

Burrowing by the roadside on Mt. Wellington.

Rhopalum variitarse, Turn.

Rhopalum variitarse, Turn. Ann. & Mag. Nat. Hist. (8) xv. p. 89 (1915). ♀.

Hab. Mt. Wellington, 2300 ft.; January. Eaglehawk Neck; February.

Rhopalum eucalypti, Turn.

Rhopalum eucalypti, Turn. Ann. & Mag. Nat. Hist. (8) xv. p. 90 (1915). ♀.

Hab. Eaglehawk Neck; March.

Rhopalum tricolor, Sm.

Crabro tricolor, Sm. Cat. Hym. B.M. iv. p. 394 (1856). ♂.

Crabro (*Rhopalum*) *militaris*, Turn. Proc. Zool. Soc. London, p. 523 (1908). ♂.

Var. *Crabro* (*Rhopalum*) *tricolor*, Turn. *l. c.* p. 524 (1908). ♂ ♀.

Hab. Mt. Wellington, 2200 ft.; January. Eaglehawk Neck; February.

A very common species in sandy districts.

Also from S.E. Australia.

Subfamily *LARRINÆ*.Genus *LARRA*, Fabr.

Three species which may be referable to this genus have been taken in Tasmania, but of these I have only taken one myself, which I identify with much doubt as *Tachytes australis*, Sauss. One only of Saussure's species can be identified with any certainty, *L. femorata*, Sauss., a species with ferruginous legs.

Larra femorata, Sauss.

Tachytes femoratus, Sauss. Mem. soc. phys. & hist. nat. Genève, xiv. p. 20 (1854). ♂.

Larra femorata, Kohl, Verh. zool.-bot. Ges. Wien, xxxiv. p. 243 (1884).

This is given by Saussure as Tasmanian (Reise Nov., Zool. ii. p. 74). It is a very common species in North Queensland, and is also found at Sydney. Though I have not seen Tasmanian specimens, I have no reason to doubt the correctness of the record.

Larra australis, Sauss.

Tachytes australis, Sauss. Mem. soc. phys. & hist. nat. Genève, xiv. p. 19 (1854) (nec Sauss. 1867).

Larrada australis, Sauss. Mélang. Hym. ii. p. 69 (1854).

Hab. Eaglehawk Neck; March.

I am not sure that my identification of this species is correct. Saussure states that the median segment is as long as the mesonotum, but in my specimens it is distinctly longer. Saussure's figure, however, shows it longer than the mesonotum.

In my specimens the pronotum is sunk much below the mesonotum, the middle portion higher than the sides, in this respect approaching *Notogonia*, but the tarsal ungues are shorter than is usual in that genus.

Larra (?) *nigripes*, Sauss.

Larrada nigripes, Sauss. Reise Nov., Zool. ii. p. 74 (1867); Schulz, Zool. Ann. iv. p. 191 (1911).

Schulz gives a description of the specimen marked as the type of this species in the Geneva Museum. But Saussure's description is of a ♀, apparently without a head, whereas the specimen described by Schulz is a ♂, with a head. This causes doubt as to whether the specimen is really the type or whether the label may not have been accidentally shifted. Schulz is inclined to place the species in *Tachytes*, though carefully pointing out how it differs from that genus in the oval posterior ocelli, in the long median segment, and in the form of the pronotum. I formerly considered the species identical with *L. psilocera*, Kohl, but after Schulz's remarks on Saussure's collection, I do not feel that this can be maintained. I have no evidence that *L. psilocera* occurs in Tasmania. I have not seen any species answering to the description given by Schulz.

The localities given in the Reise d. Novara are not always reliable, and it cannot be considered at all certain that the present species is Tasmanian.

Genus TACHYSPHEX.

Key to the Tasmanian Species.

♀ ♀.

- | | |
|---|--------------------------------|
| 1. Median segment smooth | 2. |
| Median segment rugose-reticulate | <i>T. rugidorsatus</i> , Turn. |
| 2. Second joint of the flagellum longer than the third | <i>T. pacificus</i> , Turn. |
| Second joint of the flagellum equal to or shorter than the third | 3. |
| 3. Second joint of the flagellum equal to the third; pygidium strongly compressed laterally | <i>T. pugnator</i> , Turn. |
| Second joint of the flagellum shorter than the third; pygidium not compressed laterally. | <i>T. discrepans</i> , Turn. |

Tachysphex pacificus, Turn.*Tachysphex pacificus*, Turn. Proc. Zool. Soc. London, p. 491 (1908). ♀.*Hab.* Mt. Wellington, 2200 ft.; January. Eaglehawk Neck; February.

Originally described from Victoria.

The antennæ are rather slender, the second joint of the flagellum considerably longer than the third.

Tachysphex discrepans, sp. n.

♀. Black; the mandibles at the apex fusco-ferruginous; tegulæ testaceous brown; spines of the anterior tarsi testaceous.

Clypeus obliquely depressed from below the middle to the apex, shining and sparsely punctured. Head opaque, the antennæ rather stout, third joint of the flagellum longer than the second by about one-quarter; eyes separated on the vertex by a distance equal to about twice the length of the second joint of the flagellum; a distinct longitudinal frontal sulcus reaching the anterior ocellus, a strong depression on the vertex behind the posterior ocelli. Pronotum very much depressed below the mesonotum, almost vertical; thorax shining and only microscopically punctured. Median segment opaque, smooth, very broadly rounded at the apex, with a deep groove on the middle of the posterior slope. Abdomen shining, microscopically punctured, a band of white pubescence on each side of the apical margin of segments 1-3; apical segment not compressed laterally, elongate-triangular. First and third abscissæ of the radius about equal in length, the second distinctly longer, recurrent nervures separated by

a distance not quite equal to the length of the third abscissa of the radius. Spines of the fore tarsi long and slender.

Length 8-10 mm.

Hab. Eaglehawk Neck ; February. Mt. Wellington, 2200 ft. ; January.

This species is near *pacificus*, Turn., but may be distinguished by the stouter antennæ, the different proportions of the joints of the flagellum, the longer second abscissa of the radius, which is only equal to the first and third in *pacificus*, and by the shorter oblique depression of the clypeus. It is a smaller species than *pugnator*, Turn.

Tachysphex pugnator, Turn.

Tachysphex pugnator, Turn. Proc. Zool. Soc. London, p. 491 (1908). ♀.

Hab. Eaglehawk Neck ; February.

Originally described from Adelaide. Tasmanian specimens have the second and third abscissæ of the radius longer than in the type, but I do not consider this difference a specific one. The apical segment of the abdomen is strongly compressed laterally, the pygidial area being long and very narrow. The second and third joints of the flagellum are about equal in length, but are a little more slender in Tasmanian specimens than in the type.

Tachysphex ruginotus, sp. n.

♀. Black ; spines of the tarsi whitish ; an apical band of white pubescence on the sides of dorsal segments 1-3. Wings hyaline, iridescent, nervures black.

Clypeus minutely punctured, narrowly transversely depressed at the apex. Head opaque, finely and closely punctured, second joint of the flagellum nearly as long as the third, eyes separated on the vertex by a distance not quite equal to twice the length of the second joint of the flagellum, a deep depression on the vertex behind the posterior ocelli, a sulcus from the posterior ocelli almost reaching the occiput, no distinct frontal sulcus. Pronotum gradually sloped, not vertical, sunk below the mesonotum ; thorax finely and very sparsely punctured, the scutellum shining. Median segment rugose-reticulate, the sides finely striated. Abdomen shining, the apical segment not much compressed at the sides, elongate-triangular. Second abscissa of the radius as long as the first and third combined, first longer than the third. Recurrent nervures separated on the cubitus by a distance about equal to the first abscissa of the radius. Comb of the fore tarsi long and slender.

Length 8-9 mm.

Hab. Eaglehawk Neck ; February.

This is distinguished from *discrepans* by the sculpture of the median segment, the more distinct puncturation of the head and thorax, and the shorter third abscissa of the radius.

Tachytes tachyrrhostus, Sauss.

Tachytes tachyrrhostus, Sauss. Mem. soc. phys. & hist. nat. Genève, xiv. p. 18 (1854). ♂; Sauss. Reise Nov., Zool. ii. p. 73 (1867). ♂; Schulz, Zool. Ann. iv. p. 189 (1911). ♂.

This is a true *Tachytes*, as Schulz observes. I have a specimen of the male from Victoria, but have not myself seen Tasmanian specimens. There is a female in the British Museum from New South Wales.

Lyroda michaelsoni, Schulz, subsp. *tasmanica*, Turn.

Lyroda michaelsoni, Schulz, Fauna Sudwest Australiens, i. p. 479 (1908).

Lyroda michaelsoni, subsp. *tasmanica*, Turn. Proc. Linn. Soc. N.S.W. xxxviii. p. 621 (1914).

Hab. Eaglehawk Neck ; February.

Subfamily *NITELINÆ*.

Nitela nigricans, Turn.

Nitela nigricans, Turn. Trans. Ent. Soc. London, p. 428 (1910). ♀.

This is nearly related to *N. australiensis*, Schulz, from S.W. Australia, but differs in the smaller and shallower depressions round the base of the antennæ, in the lesser development of the carina on the front and clypeus, and in the wholly black anterior tibiæ. I doubt if these differences are more than of subspecific value.

Hab. Eaglehawk Neck ; March.

Taken on a fallen *Eucalyptus* log.

Subfamily *TRYPOXYLINÆ*.

Genus *PISON*, Jur.

Key to the Tasmanian Species.

- | | |
|---|-----------------------------|
| 1. Legs red | 2. |
| Legs black | 3. |
| 2. Three cubital cells ; posterior ocelli nearer to each other than to the anterior | <i>P. rufipes</i> , Schuck. |
| Two cubital cells ; ocelli in an equilateral triangle..... | <i>P. simulans</i> , Turn. |

3. Second recurrent nervure received by the second cubital cell; posterior ocelli separated from the eyes by a distance equal to less than half their diameter. Length under 9 mm. *P. westwoodi*, Shuck.
- Second recurrent nervure received by the third cubital cell or interstitial with the second transverse cubital nervure; posterior ocelli separated from the eyes by a distance fully equal to three-quarters of their diameter. Length about 14 mm. *P. spinolæ*, Shuck.

Pison rufipes, Shuck.

Pison (Pisonites) rufipes, Shuck. Trans. Ent. Soc. London, ii. p. 79 (1837). ♀.

Hab. Eaglehawk Neck; February. Mt. Wellington, 2200 ft.; January.

This species is also common throughout the southern portion of Australia.

Pison spinolæ, Shuck.

Pison spinolæ, Shuck. Trans. Ent. Soc. London, ii. p. 76 (1837). ♀.

Pison australis, Sauss. Mem. soc. phys. & hist. nat. Genève, xiv. p. 11 (1853).

Pison tasmanicus, Sm. Cat. Hym. B.M. iv. p. 316 (1856).

Hab. Eaglehawk Neck; February.

Also throughout S.E. Australia, as far north as Toowoomba.

Pison westwoodi, Shuck.

Pison westwoodi, Shuck. Trans. Ent. Soc. London, ii. p. 77 (1837). ♀.

Hab. Eaglehawk Neck; February; Mt. Wellington, 2200 ft.; January.

Shuckard states that the carina in the longitudinal groove on the median segment is obsolete in this species. In a series of twenty specimens collected by myself the carina is usually quite distinct near the base of the segment, but there is considerable variation in this character. I have recorded the continental form of this species as *P. iridipenne*, Sm. (Proc. Zool. Soc. p. 512, 1908), but the form of the clypeus differs in that Hawaiian species, being broadly and evenly rounded, whereas in *westwoodi* it is distinctly produced in the middle. The two forms are, however, very close. The posterior ocelli are nearer to the eyes in *iridipenne* than in typical *westwoodi*, but North Queensland specimens of *westwoodi* come very near *iridipenne* in this point. *P. westwoodi* is probably spread over the whole of Australia.

Pison (Parapison) simulans, sp. n.

♂. Black, opaque; the tibiæ and tarsi ferruginous; the hind tarsi stained with black. Wings hyaline; nervures fuscous.

Clypeus produced into a short tooth in the middle of the apical margin; ocelli in an equilateral triangle, the posterior pair as far from each other as from the eyes; second joint of the flagellum no longer than the third. Pronotum on a level with the mesonotum, with a distinct dorsal surface. Median segment as long as the mesonotum, narrowed towards the apex, as long as broad, finely obliquely striated, with a deep median groove in which is a well-defined carina, the surface of the posterior slope almost smooth, with a deep median groove. Abdomen subopaque, minutely and closely punctured, the first segment longer than its apical breadth; the second segment distinctly constricted at the base. Two cubital cells only, the first abscissa of the radius twice as long as the second, first recurrent nervure received just beyond three-fifths from the base of the first cubital cell, second close to the base of the second cubital cell.

Length 6.5 mm.

Hab. Eaglehawk Neck; March.

Nearest to *Pison (Parapison) erythrocerum*, Kohl, but differs in the stronger sculpture of the median segment, in the colour of the femora and antennæ, and in the much greater length of the second abscissa of the radius. Superficially it closely resembles *P. rufipes*, Shuck.

XLIX.—On Three new Bats obtained by Mr. Willoughby Lowe in the Sudan. By OLDFIELD THOMAS.

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DURING Mr. Abel Chapman's recent expedition to the Sudan, Mr. Willoughby Lowe obtained a considerable collection of mammals, and among them a number of bats. These include, besides *Coleura afra*, *Mops demonstrator*, and others, examples of the three following new species:—

Rhinopterus lowei, sp. n.

Larger than *R. floweri*; white instead of buffy below.

General characters as in *R. floweri*, but size, as gauged by



Turner, Rowland E. 1915. "Notes on Fossorial Hymenoptera—XVI." *The Annals and magazine of natural history; zoology, botany, and geology* 15, 537–559.

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