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Contributions to the Natural History of Australian Ants.

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(Concluded from p. 280).

13. *Formica minuta*, Lowne. — Worker: length 1 line. Shining black, except the first joint of the antennæ and tarsi, which are testaceous. Head very large, much broader than the thorax, emarginate behind. Mandibles rufo-ferruginous, covered with scattered silky hairs. Thorax elongate, with a deep strangulation between the meso- and metathorax, obscurely punctured. Scale of the peduncle ovate, its upper margin entire. Abdomen ovate.

I found this insect amongst dried sticks and bark, whilst searching for Coleoptera.

14. *F. purpurescens*, Lowne. — Worker: length 2 lines. Rufo-piceous, with a purpurescent tinge, especially during life; abdomen black. Head nearly twice as broad as the thorax, emarginate behind. Antennæ almost testaceous. Head and thorax finely rugose. Thorax elongated, with a deep constriction between the meso- and metathorax. Scale of the peduncle ovate and pointed above. Abdomen ovate, the apical margins of the segments piceous, thinly covered with pale pubescence. Tarsi testaceous.

Female 4 lines long, piceous, with rufo-piceous antennæ and tarsi. Head scarcely so broad as the thorax. Thorax elongate-ovate. Scutellum convex. Head and thorax thinly clothed with a pale silky pile. Abdomen nearly smooth, the apical margin of the segments rufo-piceous. Wings hyaline, with piceous nervures.

These insects make their nests in the ground or in decaying stumps of trees.

15. *F. inequalis*, Lowne. — Female nearly 3 lines long. Head, thorax and abdomen dark brown above, with a few

coarse hairs scattered over them, much lighter beneath; antennæ, mandibles and clypeus coloured like the under side of the body, pale ferruginous. Head subquadrate, emarginate behind. Ocelli very large and glassy bright. Antennæ elongate, setaceous. Wings fusco-hyaline, with the nervures of a darker tinge; the nervures dividing the submarginal cells incomplete posteriorly, so that the cells communicate with each other. Thorax transversely wrinkled on the disk. Abdomen with the apical margins of the segments broadly pale fuscous, wrinkled longitudinally. Scale of the peduncle subcylindrical and elongate.

Male less than a line long, shining piceous, paler beneath, with coarse hairs scattered over it. Disk of the thorax opaque. Flagellum and tarsi ferruginous. Head narrower than the thorax. Eyes and ocelli very large, the latter glassy bright. Antennæ setaceous, nearly or quite as long as the insect. Mandibles, clypeus and sides of the face ferruginous. Scale of the peduncle as in the female.

I took these insects in copulation: they inhabit the nests of *Ponera metallica*. I never found the workers. The great difference in the size of the sexes, as well as in their colour, is very remarkable.

Genus ACANTHOLEPIS, *Mayr.*

A very remarkable genus, forming a connecting-link between *Formica* and *Myrmica*. I collected three species of this genus, all undescribed, and all differing from the European species in the complete absence of ocelli in the workers. They are Formicidæ, with six-jointed maxillary and four-jointed labial palpi, carinæ over the insertion of the antennæ, and with the thorax more or less marked with tubercles or prolonged in blunt tubercular spines.

16. *A. tuberculatus*, Lowne.—Worker 2 lines long. Rufopiceous. Head twice as broad as the thorax, subquadrate, deeply emarginate behind. Antennæ as long as the head and thorax, inserted in a deep fossa. Flagellum thickened towards the apex, and covered with short hairs (as in *Ponera*). Eyes ovate, inserted near the antennæ. Ocelli obsolete. Thorax narrowed anteriorly, almost globose above, with sharp slightly recurved lateral margins, separated from the mesothorax by a deep groove. Mesothorax rounded above,

and terminating posteriorly in three small blunt tubercles, the middle one the longest. Metathorax separated from the mesothorax by a strangulation, narrowed in front and rounded above and behind, with a bright glassy spot, like an ocellus, on either side. Scale of the peduncle large, ovate, with its upper margin entire. Metathorax and abdomen punctured. Abdomen subglobose.

On the ground amongst loose sticks and leaves.

17. *A. mamillatus*, Lowne.—Worker less than 2 lines long. Obscurely rufo-piceous. Head broader than the thorax, emarginate behind. Carinæ on the face short. Eyes large, ovate. Flagellum covered with short hairs. Ocelli obsolete in the workers. Thorax narrowed anteriorly, subglobose above, its anterior and lateral margins sharp. Mesothorax separated from the thorax by a slight groove, terminated posteriorly in two small rounded tubercles. Metathorax subglobose above, transversely striated with a few scattered hairs on its sides. Scale of the peduncle ovate. Abdomen globose.

On the ground amongst loose sticks and leaves.

18. *A. Kirbiï*, Lowne.—Worker 2 lines long, bright chestnut-red; abdomen shining black. Head broader than the thorax, deeply emarginate behind. Flagellum enlarged towards the apex. Ocelli obsolete. Thorax subglobose. Metathorax flattened laterally and narrowed in front, terminating posteriorly in two long blunt converging tubercles. Head and thorax punctured. Metathorax longitudinally rugose. Scale of the peduncle ovate. Abdomen globose. The whole insect is covered with scattered hairs.

Under loose bark in spring and early summer.

Genus POLYRACHIS.

a. *Maxillary palpi elongated.*

19. *P. Ammon*, Sm. — I found the workers of this species apparently hibernating in small colonies under stones, where they construct no galleries or chambers. The Australian species of this genus remain concealed until summer is well advanced, and I think it extremely probable that later in the summer they may construct a nest of some papyraceous or other material, like *P. nidificans*; of this, however, I have no proof.

20. *P. Latreillii*. — In cracks in stumps, in spring. In

some localities they appear in large numbers, running on the ground and on the trees, in the middle of November. I never saw any nest.

21. *P. Hookeri*, Lowne. — Worker 3 lines long; head and thorax metallic-green, finely shagreened; abdomen black, and legs rufo-piceous. Head as broad as the thorax. Face strongly carinated. Carina overhanging the insertion of the antennæ considerably. Scape of the antennæ rufo-piceous. Flagellum black, with moniliform joints. Thorax rounded above and flattened laterally, narrowed behind; margins acute, slightly recurved. Prothorax with a small spine at each anterior angle. Metathorax prolonged in two long spines posteriorly. Scale of the peduncle furnished with two curved spines, longer than those of the metathorax. Abdomen globose.

As in the other species, I never found any nest. I only found the workers running on the ground.

b. *Maxillary palpi abbreviated.*

22. *P. foveolatus*, Lowne. — Worker: length 4 lines. Black. Head, thorax, and scale of the peduncle pitted with large hexagonal pits. Abdomen clothed with a dense golden pubescence. Legs rufo-testaceous, occasionally piceous. Head narrowed anteriorly. Face with two elevated carinæ. Thorax elongate, rounded anteriorly. Metathorax terminated posteriorly with two acute slightly curved spines. Scale of the peduncle incrassate, unarmed. Abdomen flattened and cordate.

Under stones and on the trunks of trees, abundant. I think their habits are similar to those of *P. Ammon*.

Genus PONERA.

23. *Ponera metallica*, Sm. — A very common species: it excavates decaying stumps.

Genus MYRMICA.

24. *Myrmica longiceps*, Sm. — These ants inhabit sandy places, and construct their nest under ground, throwing up little heaps of sand about six inches in diameter and two or three inches high, with a funnel-shaped opening to the nest in the centre of each, often nearly an inch in diameter: a number of the insects are usually lurking in the opening, but they retreat into the interior at the slightest cause for alarm.

Genus CREMATOGASTER.

25. *Crematogaster pallidus*, Lowne. — Female less than a line long, pale testaceous. Head and mesothorax smooth. Eyes large, ovate and black. Metathorax punctured, flattened above, and armed with two short acute spines. First node of the peduncle punctured and elongate; second node globose and smooth. Abdomen heart-shaped, with a few pale stiff hairs scattered over it. Worker like the female, except that the meso-, metathorax and peduncle are rugose, instead of punctured.

These ants excavate the earth under large stones. I found two species of *Pselaphus* in one nest of this ant: I gave them to my friend Mr. Ramsey, of Ashfield, N.S. Wales, who was engaged at the time in a Monograph on Australian *Pselaphidæ*.

26. *C. piceus*, Lowne. — Worker $1\frac{1}{2}$ line long. Piceous. Head nearly twice as broad as the thorax, almost globose above, and slightly flattened posteriorly. Mesothorax rugose, rounded and broad in front, narrowed behind, with its disk concave. Metathorax narrowed in front, concave above, flattened laterally, and armed with two stout acute spines. First node of the peduncle, viewed in front, broad and rounded at the base, and narrowed upwards, its apex obtuse. Second node subglobose, with a deep longitudinal cleft above. Abdomen heart-shaped, with pale stiff hairs scattered over it.

I never found the nest of this insect.

27. *C. leviceps*, Sm. — In small colonies under loose bark, apparently making no nest, at least in spring.

Genus MYRMECIA.

28. *Myrmecia gulosa*, Fabr. — These ants throw up a large conical dome of earth or sand, often a foot high, in light soils, with the opening to the nest in the centre. I have observed that they close the entrances in wet weather with leaves. The pupæ are enclosed in cocoons, thus forming a remarkable exception to the general character of the *Myrmicidæ*, which have usually naked pupæ. The chambers in which the pupæ are placed are most often nearly two feet below the surface of the ground. These ants are amongst the most rapacious and numerous of Australian species: they climb trees in vast numbers to attack the great *Anaplognathi*, which they pull down and bury alive in the earth, although in point of bulk the beetles bear very much the same relation

to the ants that an elephant does to man: I have, however, often seen three ants bring one of the largest to the ground in spite of all its exertions. Their sting is very severe, but the pain occasioned is evanescent.

29. *M. pyriformis*, Sm. } Resemble *M. gulosa* exactly in
30. *M. tarsata*, Sm. } habit.

31. *M. nigrocincta*, Sm. — Makes a small dome-shaped hill of earth, and covers it very neatly with small sticks and leaves. This insect is remarkable for the leaps it takes in running, often jumping over a foot of ground at a leap; it also jumps from the trunks of trees upon persons walking near it. Its sting is very severe.

32. *M. picta*, Sm. — I only found a few solitary individuals.

33. *M. urens*, Lowne. — Worker 4 lines long. Black. Mandibles, anterior tibiae and tarsi, and posterior and intermediate tarsi, pale reddish yellow. Head longitudinally striated. Carinae between the antennae not continued so far as the anterior ocellus; posterior margin of the head emarginate. Thorax and first node of the peduncle transversely rugose. Abdomen covered with a cinereous pubescence.

I know nothing of its habits, except that it stings severely.

GENUS CRYPTOCEPHALUS.

34. *Cryptocephalus pubescens*, Sm. — In dry sandy places near the sea this insect is very common. These curious little ants live underground, throw up no hill, but make a conical hole in the sand: they carry every fragment they remove to a distance from the nest, and roll themselves up, like many beetles, and lie motionless for a long time, when alarmed or touched.

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Entomological Notes and Captures.

286. *Do Male or Female Lepidoptera first emerge from the Pupa?* — Mr. Greene's interesting note (Entom. 325) on the prior appearance of the male or female of various species of Lepidoptera shows how needful it is to apply the test of experiment (where possible) to all our opinions, and how apt we are to accept as truth what is only tradition or assumption. Until Mr. Greene surprised me by throwing doubt on the commonly received opinion that the males usually

appeared before the females, I had never heard it called in question: since then circumstances have prevented me from rearing many larvæ; but in the few broods of which I have been able to take note the facts confirm Mr. Greene's view, that in the majority of cases the female is the first to appear. I give the dates of the emergence of five broods—two of *Lithosia caniola*, one of *Orgyia fascelina*, one of *Amphydasis prodromaria*, one of *Dianthœcia capsophila*: in all, except *capsophila*, the female appeared first. I trust some of your correspondents who have had a wider experience in rearing *Lepidoptera* will furnish notes on the point, as no rule can be laid down from isolated cases.

LITHOSIA CANIOLA, 1864.

July 21st, one female; 22nd, one female; 23rd, three males, ten females; 24th, eight males, five females; 25th, eight males, six females; 26th, five males, four females; 27th, five males, five females; 28th, eight males, four females; 29th, four males, four females; 30th, five males, three females; 31st, three males, two females; August 1st, three males, two females; 2nd, two females. Total—Males fifty-two, females forty-nine.

L. CANIOLA, 1865.

July 11th, two females; 12th, five females; 13th, two males, two females; 14th, two males, eleven females; 15th, two males, eleven females; 16th, eight males, twenty-two females; 17th, fifteen males, twenty-three females; 18th, twenty males, twenty-seven females; 19th, twenty-two males, ten females; 20th, twenty-five males, seven females; 21st, twelve males, nine females; 22nd, fifteen males, eleven females; 23rd, eight males, four females; 24th, seven males, five females; 25th, five males, one female; 26th, five males; 27th, two males. Total—Males one hundred and fifty, females one hundred and fifty. In this brood seven females appeared before the first male, and seven males emerged after the last female.

ORGYIA FASCELINA, 1865.

June 18th, one female; 19th, six females; 20th, two males, one female; 21st, three males, two females; 22nd, two males, three females; 23rd, one female; 24th, one male, two females; 25th, two males, one female; 26th, three males,