

[From the Proceedings of the Linnean Society of New South Wales,
1906, Vol. xxxvi., Part 4, November 28th.]

NEW AUSTRALIAN SPECIES OF THE FAMILY
AESCHNIDÆ.

[NEUROPTERA: *Odonata.*]

BY R. J. TILLYARD, B.A.

(Plate lxxviii.).

i. Subfamily **CORDULEGASTERINÆ.**

No species of this subfamily has previously been recorded from Australia. In December, 1903, Mr. G. A. Waterhouse took, while collecting in the Blue Mountains, two dragonflies. One of these is in the possession of Mr. W. W. Froggatt; the other was sent home to England for identification, but has not since been heard of. Some time ago I noticed the dragonfly in Mr. Froggatt's collection, and requested him to allow me to send it to M. René Martin of France, as I believed it was a new species. M. Martin was much struck with the beauty and peculiarity of the insect, and forwarded it to Dr. Ris of Belgium, who pronounced it to be *Petalia Apollo* ♀, a rare insect, so far only known to occur in Chili; he was also strongly of opinion that there had been some mistake as to locality until I convinced him of the truth of the capture. If we have in Queensland a dragonfly (*Ceriagrion glabrum*) whose only other known locality is Central Africa, it need hardly occasion surprise that we should also have on the Blue Mountains a dragonfly that until now had only been known to inhabit the Andes.

As the insect is a most remarkable and beautiful one, I append a short description:—

PETALIA APOLLO Selys.

♀. Total length 59 mm.; abdomen 44 mm.; wings, fore 39 mm., hind 37 mm.

Wings pointed, forewings rather narrow, reticulation rather open; basilar space free, hypertrigonal space with one cross-nervure. *Triangles* short, broad, once crossed; a large open cell

at the base of the wings. Subcostal and median nervures blotched from base to arculus with deep reddish-black; on the same nervures, half-way to the nodus, is a semicircular spot of deep ruby colour surrounded by black; in the hindwings this spot touches the costa. On the forewings only, half-way between this spot and the nodus, is a similar but smaller spot. On all the wings there are also four larger spots of the same colour, somewhat irregular in shape, and placed as follows:—one enveloping the nodus and first postnodal, a second half-way between the nodus and pterostigma, a third under the pterostigma itself, and a fourth, rather oval in shape, at the tip of the wing. *Pterostigma* narrow, 3.6 mm., bright ruby-red. *Nodal Indicator* ||13-14 9-11|
 Head: *Eyes* touching for about 2 mm., a ridge of || 9-10 10 |
 stiff hairs at back of orbits. *Epicranium* hairy; seen from above, the front is slightly curved, projecting outwards and slightly upwards like a flat shelf; the vertex and ocellar area tucked away between it and the eyes. Colour very dark brown, a paler line along the frontal ridge. *Antennæ* short, black, basal joint thickened. *Postclypeus* broader than front, dark brown, a transverse band of orange-brown; *anteclypeus* narrow dark brown; *labrum* dark brown with a transverse narrow band of orange-brown; *labium* and *mandibles* dark brown. *Thorax*: *Prothorax* brown. *Meso-* and *metathorax* short, downy, dark chocolate-brown; a pair of humeral orange bands, almost straight, pointed slightly outwards in front; on either side two broader lateral orange bands wide apart, the upper one followed closely by a round orange spot close to mesocoxa. *Legs* rather short and thick, black with brown femora. *Abdomen*: Moderately stout; 1-2 and 8-9 slightly swollen; 2-7 with medial, transverse, supplementary carinæ; latter and sutures black; markings of abdomen faded and indistinct in the only specimen I have seen; ground-colour brown; 9 carrying 2 filaments, 1.5 mm. long; 10 rather narrow, rounded below, carrying a blunt tubercle, sparingly hairy, followed by another tubercle underneath. *Appendages*: Straight, cylindrical, 1.2 mm. long, wide apart, parallel, tips blunt; colour black.

Hab.—Chili; Blue Mountains (Katoomba), Australia; two specimens only, captured by Mr. G. A. Waterhouse, December, 1903.

The somewhat isolated group of genera, *Petalia*, *Hypopetalia*, and *Phyllopetalia*, are, except this one record, confined exclusively to Chili.

ii. Subfamily AESCHNINÆ.

Fifteen species of this subfamily are already recorded from Australia. Four more are now added, three of which are new to science, one of them forming the type of a new genus.

1. ANAX GUTTATUS Burm.

This large and handsome species is common throughout the East Indies, New Guinea and the Seychelles. It has not, however, been recorded before from Australia. I found it flying over the Carrington Marsh, Atherton, in January, 1905; later on I noticed one or two specimens near Cairns, and one only at Townsville. It is a most difficult insect to capture, for it flies well out from the banks, darting in and out of the reeds at terrific speed. I took half-a-dozen males in three days, but never saw a female. There is only one way to capture them, and that is to wade out into the marsh and hide in some favourite clump of reeds, netting them as they career past. One failure in striking is fatal, as the insect will at once mount high into the air and disappear from sight. The flight is like that of *Hemianax papuensis*, only more vigorous and dashing; the dark green thorax, followed by the brilliant sky-blue of the upper part of the abdomen, makes this insect truly a magnificent object as it dashes at lightning speed up and down the marshes.

2. PLANAESCHNA COSTALIS, n.sp.

♀. Unique. Total length 92 mm.; abdomen 69 mm.; wings, fore 69 mm., hind 68·5 mm.

Wings with a deep russet-brown colouration covering the lower half of the costal space up to nodus and all of it beyond, also all the subcostal and median spaces, except the basilar area. *Pterostigma*

long, 7 mm., rose-red, strongly braced. *Membranule*, fore 2 mm., very wide; hind 9 mm., wide and curved at base, then becoming very narrow; colour dull whitish. *Nodal Indicator* 29-31 25-27 |
Head: *Vertex* tubercled, hairy, brown; *antennae* 23-25 26-27 |
 3·5 mm., brown, basal joint thickened; *eyes* meeting for a distance of 5 mm, dark brown. *Front* large, hairy, pale brownish, projecting forwards and pointed in the form of an anvil (compare *Telephlebia Godeffroyi*). *Clypeus*: postclypeus vertical, high; anteclypeus compressed, narrow, pale yellowish-brown. *Labrum* wide, massive, pale yellowish-brown; *labium* cinnamon-brown, mandibles brown. *Thorax*: *Prothorax* small, pale yellowish-brown. *Meso-* and *metathorax* short, broad, dark brown; dorsal ridge high and strongly marked, rising to an obtuse-angled point; on each side a pale whitish humeral ray; below, a parallel equal ray of the same colour; both rays slightly irregular. *Legs* dark brown, tibiae with strong bristles. *Abdomen* cylindrical, 1-2 slightly swollen, 8-10 somewhat enlarged below; colour dark chocolate-brown, markings, if any, obliterated; 10 enlarged beneath into a projection ending in a semicircular 8-denticulate plate, reaching just beyond the appendages. Underside dark brown. Spur of ovipositor huge, reaching to end of abdomen (see Plate lxviii, figs. 2a-2b). *Appendages* nearly as long as 10, narrow, subcylindrical, pointed, wide apart, separated by the upper projection of 10; dark brown.

Hab.—New South Wales (circa 1870).

The unique specimen described above is in the Australian Museum, Sydney. It is an old and discoloured specimen, and must have been put away for many long years, nobody knowing what a prize it was. It carries a label marked N. S. W., but this indeed would be insufficient evidence on which to base its claim to be an Australian insect, were it not for the fact that it belongs to a group of subgenera which are known to be exclusively Australian, viz., *Austroaeschna*, *Acanthaeschna*, and *Planaeschna*. As to which of these genera it in reality belongs, it is impossible to say because the male is unknown. The markings on the thorax being straight bands, it should probably

be placed in *Planaeschna*. However, considering its huge size and the markings on the wings, it should perhaps be made the type of a new genus allied to this group. The expanse of wings in this insect is 144 mm., or close on 6 inches, making it one of the largest known dragonflies and only second, amongst Australian Odonata, to *Petalura gigantea*, which reaches 6½ inches in expanse.

3. *PLANAESCHNA*(?) *FORCIPATA*, n.sp.

♂. Total length 67 mm.; abdomen 52 mm.; wings, fore 45 mm., hind 44 mm.

Wings: Neuration black; anal triangle of hindwings 3-celled. *Pterostigma* 2.5 mm., black. *Membranule*, fore very small; hind, 1.5 mm., brown. *Nodal Indicator* ||22 16-18| Head: *Vertex* small, hairy, black; central ocellus ||15-16 16-17| brilliant, other two black, smaller; *antennæ* 2 mm., black. *Eyes* dark green in the living insect; *occipital triangle* black. *Front* high, dark brown, almost black in centre. *Clypeus* rich brown; *labrum* black; *labium* and *mandibles* deep brown. *Thorax*: *Prothorax* very small. *Meso* and *metathorax* black or very dark brown marked with five bright green stripes on either side, as follows—the first humeral, short, straight, a small sharp point in front on the outer side; the second subhumeral, longer, curved; the third lateral, broader, reaching from the fore wing-joints towards the mesocoxa; the fourth narrow, crossed by a black line at about two-thirds of its length; the fifth sublateral, close to abdomen, very broad, subtriangular in shape. *Interalar ridge* marked with green; *scuta* and *scutella* green surrounded with black; wing-joints black spotted with green. *Underside* dull brownish. *Legs* black. *Abdomen* rather thin, 1-2 swollen, 3 much pinched, 4-9 gradually widening, 10 much larger than 9, cut off square anally. *Colour*: 1, deep rich brown; all the rest jet black spotted with a beautiful rich green as follows—2 with four dorsal rays in the form of a cross, not meeting in the centre; a transverse anal ring broadening on the sides, and a basal spot on either side reaching to the spurs, which are blunt, green above and black beneath: 3-7 with a pair of rounded anal spots: 6-7 have also a

pair of narrow slanting pointed marks: 8-10 black: 10 with a pair of small black tubercles, sharply pointed, above the bases of the superior appendages; 10 also much tubercled and swollen below inferior appendage. *Appendages*: *Superior* 3 mm., depressed, forcipate, black; wide apart at bases. *Inferior* 2.2 mm., truncate, broad at base, very thick, black, concave and marginate above. (See Plate lxviii., figs. 1a-1b).

Hab.—Kuranda, N.Q.; January, 1905; rare; three males only.

It flies very swiftly up and down densely wooded mountain creeks, often hovering, perfectly still, over some favourite pool, or resting on a twig or jutting piece of rock in places where the rocky banks of the jungle creeks are overhanging or vertical. It is very difficult to capture.

As the appendages differ from the typical *Planaeschna* form, notably in the shortness of the superior and the comparative length of the inferior, this insect should probably form the type of a new genus.

5. *CALIAESCHNA* *CONSPERSA*, n.sp.

♂. Total length 58-61 mm.; abdomen 43-45 mm.; wings, fore 36-39 mm., hind 35-38 mm.

Wings: Neuration black; triangles three-celled in fore and two-celled in hindwings, preceded by 4-5 nervules in submedian space. *Anal triangle* of hindwings fairly broad, right-angled, 3-celled, bases of wings touched with deep brown. *Pterostigma* 2 mm., covering about two cellules, dark brown (fulvous in immature specimens). *Membranule*, fore small; hind 2 mm., rather narrow, pure white. *Nodal Indicator* ||15-16 10-11| sixth antenodal thickened. Head: *Vertex* a very || 10 9-10| small dark brown tubercle; *antennæ* short, black; *eyes* brown, meeting along their whole length; *occipital triangle* very small, cream-coloured. *Front* very high and large, with a well-marked semicircular ridge above, running from one side to the other, and carrying a short row of hairs on top; that part of the front in advance of the ridge is strongly granulate, flattened at the sides, but raised in the middle into a low triangular pyramid somewhat rounded off at the top; colour dark brown, slightly paler in front of ridge; a

triangular cream-coloured spot on the pyramid in front; behind the ridge, low down on either side, is a large cream-coloured oval spot. *Postclypeus* large, pale cream-coloured, with a pair of squarish dark brown spots next anteclypeus, separated above from the front by a very dark brown transverse band in the suture; this band expands slightly downwards in the centre, shading the postclypeus; *anteclypeus* small, dark brown. *Labrum* cream-coloured, shaded at sides with dark brown, and surrounded by the same colour; *labium* and *mandibles* dark brown, a round cream-coloured spot on the genæ. *Thorax*: *Prothorax* very small, dark brown. *Meso-* and *metathorax* rich dark chocolate-brown spotted with pea-green (yellow in immature specimens) as follows—a pair of oval humeral spots, pointed in front; followed behind by a pair of small spots slightly elongated transversely; just below these, outwards, a pair of small narrow elongated spots. Dorsal ridge elevated into an obtuse spine at the centre. On each side are three small spots forming a triangle, and in front of them a large round cream-coloured spot; above this a small round subhumeral point; near the fore wing-join, two spots, the upper one narrow, the lower subtriangular; low down near the hind wing-join a rounded spot, followed in front by another oval spot; and in front of the latter a large cream-coloured spot low down on the metapleurum. Underside dirty brown. *Legs* black, femora brown. *Abdomen*: 1-2 swollen, 3 pinched, 4-10 subcylindrical, broadening out from 5-7. Genital appendages of 2 very conspicuous, the segment projecting anally downwards so as to form an acute-angled protuberance. Colour of abdomen deep rich chocolate-brown spotted with pale pea-green (pale yellow in immature specimens) as follows—1 with a small round dorsal spot, and a pair of larger lateral spots: 2 with a narrow triangular basal dorsal spot flanked below on either side by a fine short transverse line; a pair of anal spots separated by the dorsal ridge; between them, on the ridge, a short line; low down on either side, two spots, one basal and touching the base of the spur, the other anal, rather pointed in front, spurs brown: 3-8 with a pair of central dorsal spots separated by the dorsal ridge, narrow

transversely; a pair of larger roundish anal spots slightly more separated; on either side, low down, a basal spot and a smaller central spot. These spots vary in size from 3-8, the central dorsal spots increasing to 7 and the anal ones flattening down to mere lines in 7-8, the sublateral spots approaching more closely together from 3-8; 9-10 shaded anally with pale green on either side of dorsal ridge. *Appendages*: *Superior* nearly 4 mm., wide apart at bases, converging and sometimes touching near tips; narrow sublanceolate, tips blunt and rounded, inner margin with a row of long soft hairs; black. *Inferior* narrow triangular, just over half as long as superior; tips slightly upcurved; concave above, marginate; colour semitransparent brown, margins darker. (See Plate lxviii., figs. 3a-3b).

♀. Generally slightly larger than ♂, differing from it as follows. Abdomen stouter than in ♂; 10 very short above, rounded below anally and projecting between appendages. Ovipositor furnished with two jointed filaments, basal joints thickened. Behind these, on 10, is a small tubercle carrying several minute teeth or spines. Appendages 1 mm., wide apart, parallel, subcylindrical, rather blunt, black.

Hab.—N. S. W.: Illawarra district, National Park, Mittagong, etc.; local; March-May.

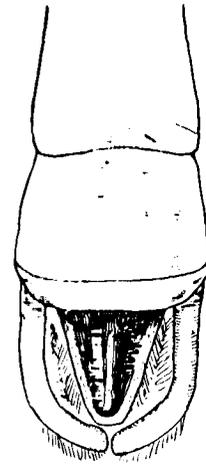
In March it flies high up about the bushes and trees around the mountain creeks; later on in the season it may also be seen flying swiftly, low over the water, especially towards evening. A difficult insect to capture.

The genus *Caliaeschna*, to which this new species belongs, contains but few species; and, with this exception, is confined to India, Afghanistan, and Asia Minor. It is therefore a somewhat remarkable discovery to find an isolated species of the genus so far removed from its centre, and with so local a distribution. The genus can be distinguished from the other Australian Aeschnine genera, *Planaeschna*, *Austroaeschna* and *Acanthaeschna*, by the fact that in these genera the basilar space of all the wings is free, while in *Caliaeschna* it is reticulated.

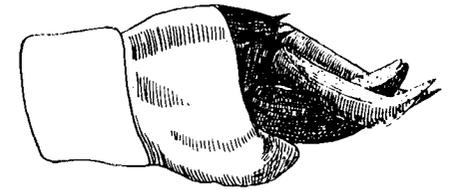
In conclusion, it may be remarked that the five species of the family *Aeschnidae* now added to the Australian list form about as miscellaneous and as remarkable a set of insects as it would be possible to find. An East Indian species, a Chilean species, and of the new ones, one belonging to an Indian genus and the other two probably the types of new genera—this serves to show us the composite character of the Australian Odonate fauna, and encourages us to believe that nowhere else in the world will careful study and collecting of the group yield so many surprises and treasures.

EXPLANATION OF PLATE LXVIII.

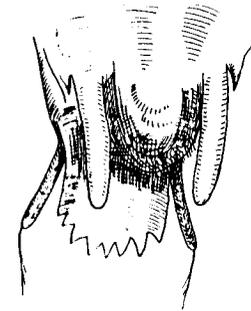
- Fig. 1a.—*Planaeschna forcipata* (♂); appendages, dorsal view.
 Fig. 1b.— " " " ; " lateral view.
 Fig. 2a.—*Planaeschna costalis* (♀); appendages, dorsal view.
 Fig. 2b.— " " " ; " lateral view.
 Fig. 3a.—*Caliaeschna conspersa* (♂); appendages, dorsal view.
 Fig. 3b.— " " " ; " lateral view.



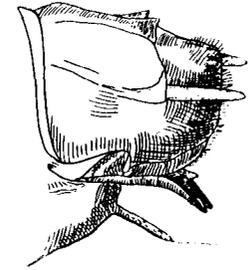
1 a



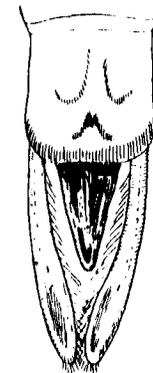
1 b



2 a



2 b



3 a



3 b

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