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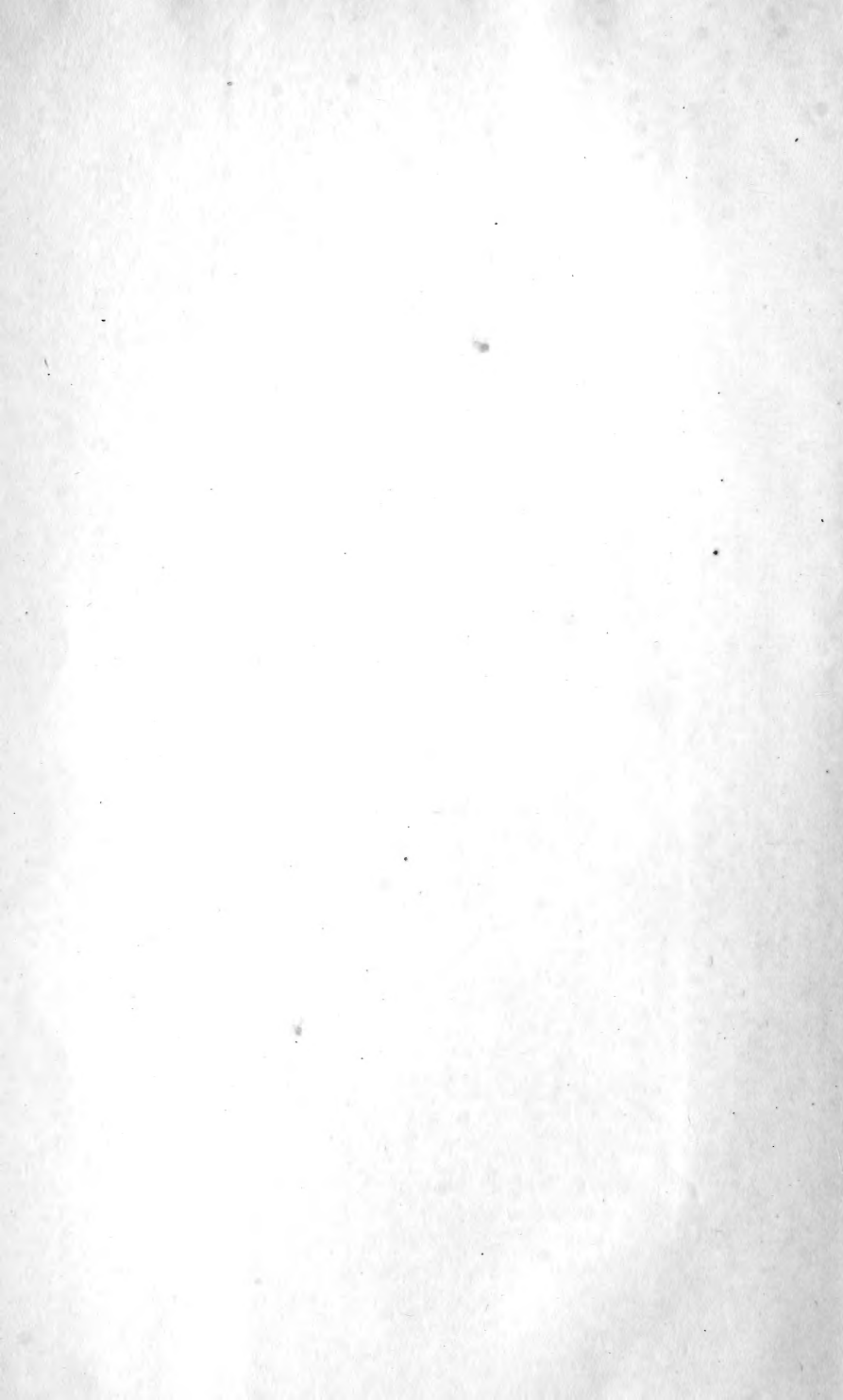
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# TRANSACTIONS AND PROCEEDINGS

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[WITH EIGHT PLATES.]



Adelaide :

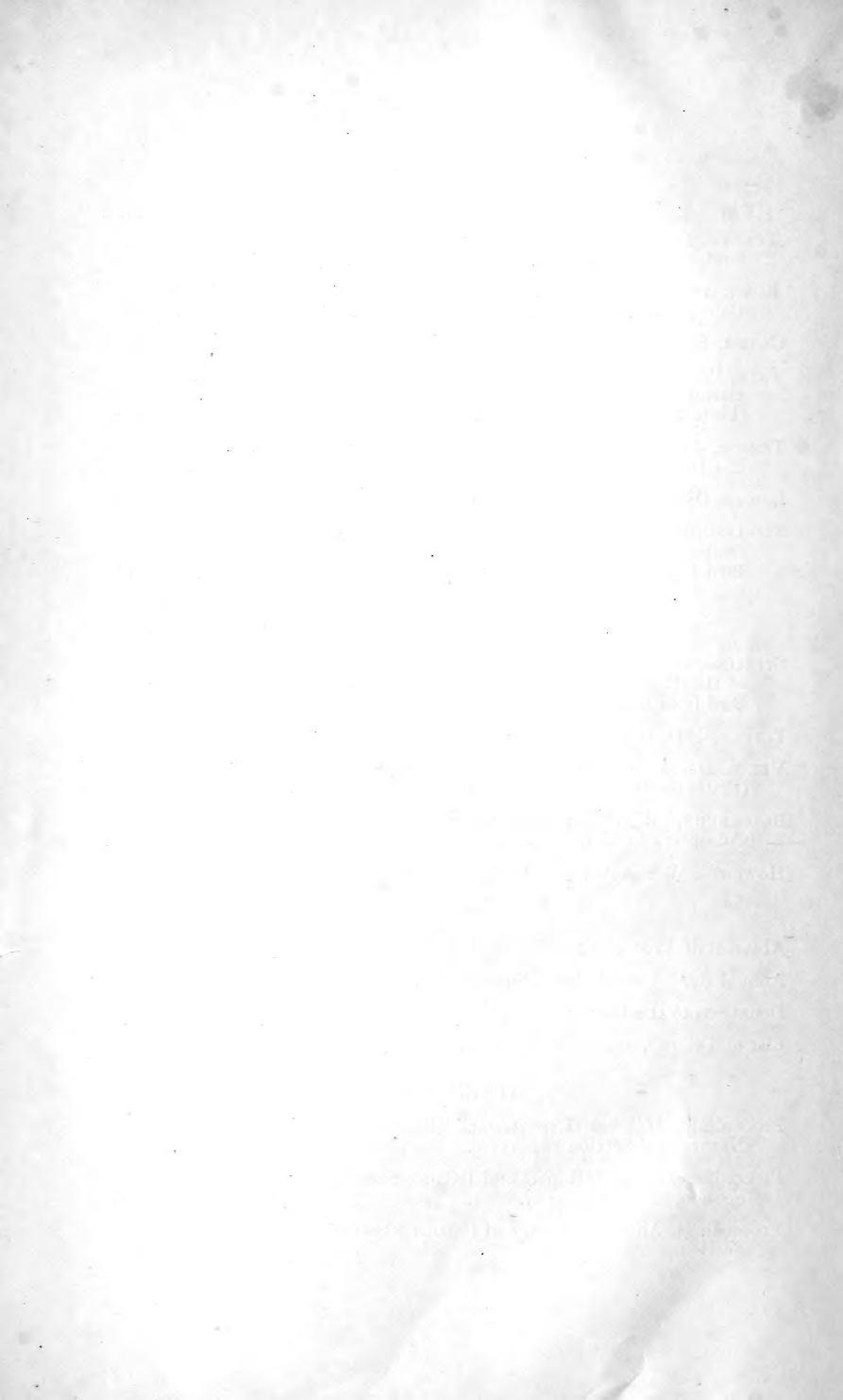
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<sup>5m</sup> DECEMBER, 1896.

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NOV 30 1896

DESCRIPTIONS OF MICRO-LEPIDOPTERA FROM  
QUEENSLAND.

By A. JEFFERIS TURNER, M.D.

[Read March 3rd, 1896.]

A somewhat hasty and unexpected visit to Europe during the printing of my former paper in the Transactions of the Royal Society of South Australia, 1894, p. 120, prevented my reading the proofs, and I must request those who refer to it to correct the following printer's errors which have crept in:—

For *Grac. eumetella*, Meyr., read *Grac. eumetalla*, Meyr.

For using the leaves, read mining the leaves.

For *Grac. albospersa*, n. sp., read *Grac. albispersa*, n. sp.

For *Grac. albomaculella*, n. sp., read *Grac. albimaculella*, n. sp.

For *Grac. enchlamyda*, n. sp., read *Grac. euchlamyda*, n. sp.

For *Lepidotarsa chryscrythra*, n. sp., read *Lepidotarsa chryserythra*, n. sp.

My recent journey has enabled me to compare my types with those of Mr. Meyrick, who, with his usual generosity, has given me invaluable help in their identification and classification. He has placed me in a position to rectify several errors in my former paper, and has saved me from many into which I should have otherwise fallen in the present instalment. At the same time it must be understood that for any errors which may exist in the present paper, I take the whole responsibility.

I have endeavored to give a complete list of all the species known to occur in the district of Moreton Bay.

GRACILARIIDÆ.

GRACILARIA, Z.

The Brisbane list must be enlarged by the addition of the following species, all of which are common here, but were previously overlooked:—

*G. nereis*, Meyr. (*G. fluorescens*, mihi, is a synonym); *G. eupetala*, Meyr.; *G. alysidota*, Meyr.; *G. tricuneatella*, Meyr.

*G. PYRIGENES*, n. sp.

I substitute this for *G. nitidula* of my former paper, the latter name having been preoccupied by Stainton for an Indian species (British Museum Catalogue XXX., 30).

G. OPHIODES, *n. sp.*

8 mm. Head and face white. Maxillary palpi minute, white. Labial palpi white; second joint with an apical, terminal joint with a median fuscous ring. Antennæ longer than forewings, whitish at base, gradually becoming dark fuscous. Thorax white; shoulders pale ochreous-fuscous. Abdomen dark fuscous. Legs fuscous; posterior tibiæ and bases of all tarsal joints white; middle tibiæ not thickened. Forewings pale ochreous-fuscous; a broad white line, black-margined in disc, along inner margin from base to middle, whence it proceeds obliquely outwards to middle of costa; an elongated white blotch on inner margin, ending abruptly at anal angle where it is thickened to reach more than half across disc, partially black-margined; a black line along posterior half of costa; a white spot on hindmargin above anal angle; costal cilia ochreous-fuscous, at apex white, with a transverse black bar and black apices, thence whitish. Hindwings and cilia dark grey.

Very distinct by the basal white line. Brisbane; one specimen on a fence in September.

ORNIX, *Z.*

I am indebted to Mr. Meyrick for the identification of this genus, which is new to Australia. It may be distinguished from *Gracilaria*, which the species described closely resembles, by the long forwardly directed tuft of scales on the head.

ORNIX AUSTRALIS, *n. sp.*

9-10 mm. Head with long tufted scales white above, fuscous on inferior aspect. Face, labial, and maxillary palpi white. Antennæ longer than forewings, dark fuscous. Thorax white, shoulders fuscous-grey. Abdomen dark fuscous. Legs whitish; anterior and middle femora and tibiæ, and posterior femora with longitudinal fuscous stripes; posterior tibiæ whitish; tarsi whitish on inferior surface, on superior surface fuscous, except apices of each joint which are pure white. Forewings fuscous-grey; a narrow white streak along costa from base to four-fifths; a broad white line along inner and hindmargin. At anal angle this broadens to one-half breadth of wing, and contains a narrow fuscous-grey streak, internal to which are a few scattered fuscous-grey scales. Sometimes this streak is continuous with ground color posteriorly. An outwardly oblique, narrow, black-margined, white streak, from costa at four-fifths, not quite reaching hindmarginal line; a second white streak, anteriorly black-margined, just before apex, parallel to first; cilia on costa fuscous, at apex pure white, with a transverse black line, then a black subapical hook, beneath this again pure white, then fuscous to anal angle. Hindwings and cilia dark-grey.



Very similar in appearance to some species of *Gracilaria*. It has the same rest-attitude. Brisbane; taken commonly on a fence from September to November; probably from an adjacent thicket of *Acacia Cunninghamii*.

CECOPHORIDÆ.

PALPARIA, *Wing*.

PALPARIA EURYPTERA, *n. sp.*

Female, 35 mm. Head and face pale ochreous. Palpi with tuft of second joint dense, porrected, as long as terminal joint. pale ochreous, tuft pinkish, at extremity fuscous; terminal joint pink. Antennæ pinkish. Thorax pink. Abdomen whitish ochreous, beneath pale yellow. Legs dusky pink; posterior tibiae, except spurs, pale yellowish. Forewings broad, costa strongly arched, especially in outer half, apex acute, hindmargin oblique, sinuate; pink, densely irrorated with pale ochreous, especially towards hindmargin; costal edge narrowly ochreous from one-fourth to apex; cilia pale ochreous, apical third pinkish except on costa and anal angle, towards apex fuscous. Hindwings ovate, hindmargin rounded; whitish-ochreous; posteriorly pinkish tinged; cilia whitish-yellow, with a pinkish line at apex.

Intermediate between *P. lambertella*, *Wing*, and the more usual forms of the genus. Brisbane; one specimen taken by Mr. Illidge in October.

EOMYSTIS, *Meyr.*

The species referred here has no specific affinity to the type, and Mr. Meyrick considers that it should be referred to *Heliocausta*, although it answers to the generic characters of *Eomystis*, which, indeed, are scarcely distinguishable from those of the former.

EURYPELTA, *Turner.*

This genus was founded in error on a female specimen, and must be withdrawn.

The species must be referred provisionally to *Heliocausta*, pending the discovery of the male.

HEMIBELA, *Turner.*

The species on which this genus was founded is closely allied to *Ocystola tyranna*, *Meyr.*, with which it agrees in the extremely short terminal joint of the palpi. It must therefore be provisionally referred to that genus. Perhaps eventually it may be found necessary to divide the genus *Ocystola*, in which case the above genus may be retained.

EUPHILTRA, *Meyr.*

*E. thermozona*, Turner, is a synonym for *E. eroticella*, Meyr.

HELIOCAUSTA, *Meyr.*

The following have been taken in the neighborhood of Brisbane:—*H. inceptella*, Walk.; *H. pelosticta*, Meyr.; *H. triphænatella*, Walk.; *H. protoxantha*, Meyr.; *H. rhodoxantha*, Meyr.; *H. mimica*, Meyr.; *H. phylacopis*, Meyr.; *H. acmæa*, Meyr.; *H. acribes*, Turner; *H. epiprepes*, Turner.

HELIOCAUSTA ACOSMETA, *n. sp.*

Female, 23 mm. Head, palpi, antennæ, and thorax pinkish-ochreous. Abdomen whitish. Legs ochreous-whitish. Forewings moderate, oblong, costa moderately arched toward base posteriorly straight, apex retangular, hindmargin straight; ochreous, inclining to pinkish; costal edge uniformly colored with disc; markings very obscure in pale fuscous; a fine dentate line curving outwards from costa beyond middle, and becoming parallel to hindmargin at six-fifths; traces of a median and inner line; a series of faint dots on hindmargin; cilia unicolorous with disc, paler at apices. Hindwings whitish; hindmargin and apex ochreous tinged; cilia ochreous-whitish, with a median fuscous line at apex.

The natural position of this insect is between *H. inceptella*, Walk., and *H. severa*, Meyr. Brisbane; one specimen.

HELIOCAUSTA ACHROA, *n. sp.*

Male, 20 mm. Head, palpi, antennæ, and thorax whitish-grey; terminal joint of palpi darker anteriorly. Abdomen whitish-grey. Anterior legs fuscous; middle and posterior whitish, tarsi fuscous. Forewings moderate; costa moderately arched toward base, posteriorly straight; apex obtusely rounded; hindmargin scarcely oblique; whitish-grey, markings fuscous; a row of minute dots from costa about middle towards hindmargin, sharply bent in disc at five-sixths, and continued parallel to hindmargin to inner-margin; a few scattered fuscous scales in disc; a row of dots along costa from four-fifths to apex, and along hindmargin to anal angle; cilia whitish-grey. Hindwings and cilia grey.

Brisbane; three specimens in October.

HELIOCAUSTA COMPLANULA, *n. sp.*

Male, 18-20 mm. Head and thorax whitish-ochreous, slightly brownish-tinged; face whitish. Antennæ whitish. Palpi rosy-whitish, terminal joint ochreous-fuscous. Abdomen ochreous-fuscous; tuft ochreous. Legs ochreous-whitish; anterior pair suffused with pink. Forewings moderately elongate, costa slightly

arched, apex rectangular, hindmargin scarcely oblique; whitish-ochreous, faintly brownish-tinged; costal edge pale rosy; a fuscous dot in disc before middle, sometimes obsolete; a second in disc beyond middle, and a third in fold obliquely beyond first; a few faint fuscous dots in disc at four-fifths, parallel to hindmargin; a row of fuscous dots on hindmargin; cilia pale rosy, apices whitish. Hindwings pale fuscous, darker at apex; cilia pale fuscous, with a darker line near bases.

Closely allied to *H. acmea*, Meyr., and *H. protoxantha*, Meyr., but may be distinguished from both. Brisbane; two specimens.

#### HELIOCAUSTA SIMPLEX, *n. sp.*

Female, 17-20 mm. Head and thorax ochreous-brownish. Antennæ fuscous. Palpi anteriorly fuscous; posteriorly whitish. Abdomen ochreous. Legs whitish; anterior tibiæ and tarsi fuscous or pinkish-fuscous; posterior tibiæ and tarsi ochreous-whitish. Forewings rather elongate, costa moderately arched, apex rounded, hindmargin oblique; brownish-ochreous, thickly irrorated with whitish scales, without markings; costal edge sometimes rosy; cilia grey. Hindwings pale yellowish; cilia pale yellowish, apices whitish.

Brisbane; two specimens.

#### HELIOCAUSTA PHANOZONA, *n. sp.*

Female, 18 mm. Head white, face fuscous. Antennæ white, with black annulations, basal joint white. Palpi, second joint fuscous, at base and apex whitish; terminal joint whitish. Thorax white, posterior apex fuscous. Abdomen ochreous-fuscous. Legs ochreous-whitish, anterior tibiæ and tarsi pale fuscous. Forewings rather elongate, costa moderately and evenly arched, apex rounded, hindmargin oblique; white, with four transverse fasciæ; first fascia at base, slightly outwardly oblique, tawny-fuscous; second from costa at one-third to middle of hindmargin, reddish-brown, anterior margin deeply concave, connected with basal fascia by a narrow tawny-fuscous line along costal edge, posterior margin irregular and suffused, partly suffusedly confluent with third fascia in costal portion of disc; third from beyond middle of costa to inner margin before anal angle, tawny-fuscous on costa, then reddish-brown for one-third breadth of disc, remainder tawny-fuscous, narrower than second, both margins irregular; fourth along hindmargin, broad at costa, gradually narrowing to a point just above anal angle, anterior portion tawny-fuscous, posterior paler fuscous, anterior edge somewhat sinuate; cilia ochreous-whitish, bases fuscous, at anal angle uniformly pale-reddish-fuscous. Hindwings and cilia uniform pale reddish-ochreous-fuscous.

This species is not near any known species of *Heliocausta*; nevertheless, as far as can be determined from the female, it appears to possess all the characters of the genus. Brisbane; one specimen.

EUCHÆTIS, *Meyr.*

EUCHÆTIS RHIZOBOLA, *Meyr.*

Brisbane.

EURYPLACA, *Meyr.*

EURYPLACA OCELLIFERA, *Meyr.*

Brisbane.

EUPRIONOCERA, *n. g.*

Head with appressed scales, sidetufts moderate, loosely appressed. Antennæ moderate, in male coarsely serrated (one), and with fine, very short ciliations (one-fourth). Pecten absent. Palpi moderate, second joint reaching base of antennæ, with appressed scales, terminal joint shorter than second, moderate, recurved. Thorax smooth. Forewings moderately elongate, hindmargin almost straight. Hindwings broader than forewings, cilia one-fifth. Abdomen rather stout. Forewings with vein seven to hindmargin, two from before angle of cell. Hindwings normal.

Distinguished by the well-marked serrated antennæ of the male and the broad hindwings. In other respects it appears allied to *Heliocausta*.

EUPRIONOCERA GEMINIPUNCTA, *n. sp.*

Male and female, 24-30 mm. Head, thorax, and palpi pinkish-ochreous; face paler. Antennæ fuscous. Abdomen ochreous, beneath pinkish-ochreous. Legs pinkish-ochreous. Forewings moderately elongate, costa gently arched, more strongly at base, apex obtusely rectangular, hindmargin almost straight; uniform dull pinkish-ochreous; a conspicuous dark-fuscous dot in disc at two-thirds; a variable number of single dark-fuscous scales along veins; cilia dull pinkish-ochreous. Hindwings ochreous-whitish, apical portion dull pinkish-ochreous; cilia dull pinkish-ochreous, towards anal angle whitish.

Brisbane; two specimens.

HOPLITICA, *Meyrick.*

The following have been taken about Brisbane:—*H. sobriella*, Walk.; *H. sericata*, Meyr.; *H. carnea*, Z.; *H. repandula*, Z.; *H. pudica*, Z.; *H. leucerythra*, Meyr.; *H. costimacula*, Meyr.; *H. rufa*, Meyr.; *H. colonias*, Meyr.; *H. absumptella*, Walk.; *H. jucundella*, Walk.

HOPLITICA RUFIMACULELLA, *n. sp.*

Male, 19 mm. Head and thorax pinkish-ochreous, face whitish. Palpi, second joint whitish towards base, towards apex rosy; terminal joint rosy-fuscous. Antennæ grey, basal joint pinkish-ochreous. Abdomen whitish-grey. Legs whitish-grey, anterior tibiæ and tarsi carmine. Forewings moderate, costa moderately arched, apex rounded, hindmargin oblique; pinkish-ochreous, with scattered scales of a deeper pink forming indistinct markings; a dot in disc before middle, a second beyond middle; a faintly indicated line from middle of costa obliquely outwards, sharply bent in disc at five-sixths, and continued parallel to hindmargin to inner-margin before anal angle; many faint pink dots along hindmargin, and in disc showing a tendency to form anterior and median lines; cilia pinkish-ochreous, tips whitish. Hindwings whitish, tinged with grey towards hindmargin; cilia grey, with a paler basal line.

Brisbane; one specimen. I could have taken more, but mistook it at the time for *H. leucerythra*, Meyr., which it closely resembles. It may be distinguished by the dots on the forewing being pink, instead of dark-fuscous. The smaller size and pink thorax distinguish it from *H. lisarca*, Meyr.

HOPLITICA EOXANTHA, *n. sp.*

Male and female, 19-23 mm. Head and thorax ochreous-brownish; face ochreous. Palpi second joint whitish, suffused with pale reddish except at base; terminal joint anteriorly fuscous, posteriorly reddish. Antennæ pinkish-ochreous, sharply annulated with black; basal joint ochreous beneath, reddish above. Abdomen ochreous-yellow. Legs whitish-ochreous; anterior tibiæ and tarsi reddish, the latter annulated with purplish-fuscous. Forewings moderate, costa strongly arched at base, thence almost straight, apex obtuse, hindmargin oblique; whitish, thickly irrorated with red scales; costal edge red, extreme edge whitish; markings purplish-fuscous, indistinct; a discal dot at two-fifths, and a second at four-fifths; three indistinctly suffused transverse lines, all partially obsolete, first at one-fifth, second just posterior to first, third through second dot, distinct on costa; a fourth line parallel to hindmargin, indistinct towards costa; a row of suffused dots along hindmargin; cilia pale pinkish, sparsely irrorated with red scales. Hindwings and cilia yellow.

Brisbane; four specimens in October.

HOPLITICA ATRIPUNCTATELLA, *n. sp.*

19-22 mm. Head and thorax pale-pinkish-grey; face whitish. Palpi whitish, terminal joint tinged with pink anteriorly. Antennæ pale-pinkish-grey, terminal half or two-thirds fuscous.

Abdomen whitish-ochreous. Legs whitish-ochreous; anterior tibiæ and tarsi reddish. Forewings moderate, costa moderately arched, apex obtuse, hindmargin oblique; pale pinkish-grey; markings jet-black; a discal dot before middle, a second beyond middle, a third on fold obliquely beyond first; a row of dots from costa before middle obliquely outwards, sharply bent in disc at five-sixths, and continued to hindmargin before anal angle; a very variable number of dots or scattered black scales in disc; a row of black dots along apical third of costa and hindmargin to anal angle; cilia pale-pinkish-grey. Hindwings whitish, apex and hindmargin sometimes pale-fuscous; cilia whitish, at apex pale-fuscous.

Brisbane; five specimens.

*HOPLITICA PORPHYRASPIIS*, *n. sp.*

Male and female, 19-25 mm. Head, face, thorax, palpi, and antennæ whitish-grey. Abdomen ochreous-fuscous, beneath whitish-ochreous. Legs whitish-ochreous; anterior tarsi barred with fuscous. Forewings moderate, not dilated; costa gently arched, apex obtusely rounded, hindmargin oblique; whitish-grey, irregularly suffused with dark-fuscous scales; basal one-third of costa, apex, and upper half of hindmargin dark-fuscous; a very large semicircular purplish-fuscous blotch extending on inner-margin from one-fifth nearly to anal angle reaching two-thirds across disc, its anterior margin rounded, its posterior margin straighter, more oblique, and acutely angled just above anal angle; two small purplish-fuscous dots in disc posterior to summit of dorsal blotch; posterior portion of disc more or less suffused with fuscous, with a paler line first oblique, then parallel to hindmargin, faintly indicated; cilia fuscous with a paler basal line, paler at anal angle. Hindwings pale-ochreous, apex suffused with fuscous; cilia pale-ochreous, at apex fuscous.

The large dorsal blotch recalls *H. colonias*, Meyr. Brisbane; five specimens.

*HOPLITICA PYRRHELLA*, *n. sp.*

Male and female, 13-19 mm. Head and face yellowish, with a red dot beneath base of each antenna. Palpi yellowish, second joint with a subapical fuscous ring, a broad median band of terminal joint fuscous. Antennæ yellowish, annulated with dark-fuscous. Thorax, anterior half crimson-red, edged with fuscous anteriorly; posterior half clear yellow, shoulders clear yellow, edged with red externally. Abdomen dark-fuscous, tuft ochreous; inferiorly ochreous-fuscous. Legs ochreous; tibiæ and first tarsal joints of anterior and middle pair with subapical fuscous annulations. Forewings elongate, costa moderately arched, apex round pointed, hindmargin very obliquely rounded; crimson-red

markings clear yellow, margined with dark-fuscous; four incomplete or interrupted fasciæ, and a discal spot; extreme basal portion of inner margin yellow; first fascia from base of costa to inner-margin at one-fourth, interrupted at fold, and thence dilated to inner-margin, where it contracts abruptly; second from costa at one-fourth obliquely outwards, angled inwards in disc, and abruptly interrupted at fold, where it sometimes anastomoses with first, thence it is continued by a yellow spot on fold, and a second spot obliquely beyond this on inner-margin beyond middle; third from middle of costa to anal angle, sometimes entire, sometimes twice interrupted; fourth broad on costa at four-fifths rapidly narrowing to a point just beyond anal angle; a yellow spot in disc between second and third fasciæ; hindmargin edged with dark-fuscous; cilia on costa first yellow, then dark-fuscous, beyond apex ochreous, towards anal angle bases crimson-red, apical halves dark-fuscous. Hindwings, basal half ochreous-yellow; apical half dark-fuscous; cilia dark-fuscous.

This and the following species belong to the natural group of which *H. jucundella*, Walk., is a type. Brisbane; twelve specimens.

#### HOPLITICA PYRITES, *n. sp.*

Female, 10 mm. Head pale-yellowish, side-tufts reddish-orange anteriorly; face whitish, with a reddish-orange transverse line. Palpi whitish, second joint with an apical, terminal joint with a median fuscous ring. Antennæ whitish, sharply annulated with black. Thorax pale crimson, with two pale yellow dots posteriorly. Abdomen fuscous, beneath whitish. Legs whitish; anterior tibiæ pale red; anterior and middle tarsi annulated with dark fuscous. Forewings elongated, narrow, costa moderately arched, apex round-pointed, hindmargin very obliquely rounded; pale crimson; markings pale yellow, outlined with dark fuscous; a basal band from costa at base, directed obliquely outwards, ending in a rounded extremity beyond fold, not reaching inner margin; an outwardly curved fascia from costa at one-fourth to inner margin before middle; an irregular band from inner margin beyond middle, not reaching centre of disc; a second fascia from middle of costa to anal angle, dilated at centre to contain a pale crimson spot; a band broad on costa at three-fourths, narrowing to a point above anal angle; some dark fuscous scales at apex; cilia pale yellow, with a median orange line at apex; at anal angle partly fuscous, partly pale crimson. Hindwings whitish, at apex pale fuscous; cilia whitish, at apex fuscous.

This exquisitely colored and delicate insect is the smallest of the genus. Brisbane; three specimens.

LOPHOPEPLA, *n. g.*

Head with appressed scales, sidetufts moderate, loosely appressed. Antennæ moderate, ciliations in male one and a half, with strong pecten. Palpi moderate, second joint reaching base of antennæ, considerably thickened with scales, somewhat loose beneath, terminal joint shorter than second, moderately stout, recurved. Thorax with small posterior crest. Forewings moderate, apex somewhat acute, hindmargin oblique, almost straight; with tufts of raised scales on disc. Hindwings narrower than forewings; cilia two-thirds. Abdomen moderate. Forewings with vein seven to hindmargin; vein two much curved from before angle of cell. Hindwings normal.

Of uncertain affinity, but seems on the whole to be nearest to *Eochrois*, Meyr., differing in the thoracic crest, and raised tufts of scales on forewings.

LOPHOPEPLA IGNIFERELLA, *Walk.*

*Hypercallia igniferella*, Walk. (Brit. Mus. Catalogue, XXIX., 670.)

Male and female, 14-16 mm. Head and face ochreous-whitish, apices of sidetufts crimson-red. Palpi whitish, second joint with a median and apical crimson ring; terminal joint with a median and subapical crimson ring. Antennæ whitish. Thorax pale-yellow, mottled with crimson-red spots; a small bifid posterior crest crimson-red. Abdomen ochreous-whitish. Legs whitish; anterior pair crimson-red, tarsi annulated with whitish. Forewings moderate, costa gently arched, apex tolerably acute, hindmargin oblique, almost straight; vivid crimson-red; costal edge pale yellowish; with very numerous irregularly distributed small pale-yellow spots, sometimes partly confluent; a fuscous dot on costa near base; a narrow oblique dark-fuscous line from costa at one-fourth to inner-margin beyond middle—on this are a few scattered scales with metallic lustre; a second line beneath costa, with which it is connected at one-half and three-quarters, thence prolonged to anal angle; a third line parallel and near hindmargin; cilia pale-yellow, with an interrupted median crimson line. Hindwings and cilia ochreous-whitish.

Unsurpassed in brilliancy of coloring. Walker's description refers without doubt to this species. Brisbane; not uncommon.

EULECHRIA, *Meyr.*

The following are taken in the neighborhood of Brisbane:—*E. convictella*, Walk.; *E. exanimis*, Meyr. (?); *E. pallidella*, Meyr.; *E. triferella*, Walk.; *E. brachypepla*, Meyr.; *E. transversella*, Walk.; *E. philotherma*, Meyr.; *E. calotropha*, Meyr.; *E. philostaura*, Meyr.; *E. xylopterella*, Walk.; *E. mesophragma*, Meyr. (?); *E. delotis*, Meyr.



Meyrick also records *E. epicausta*, Meyr., from Helidon. The identification of two of the species in the above list is not quite certain. The form attributed to *E. mesophragma*, Meyr., may be either a local variety or a new species. There are certainly many more species of this genus to be discovered here. I have several apparently new species besides those given below, but do not propose to describe them at present.

*EULECHRIA STIGMATOPHORA*, *n. sp.*

Male, 16-19 mm. Head and face pale ochreous. Palpi ochreous-whitish, second joint with an indistinct fuscous subapical ring, terminal joint fuscous anteriorly. Antennæ ochreous-fuscous. Thorax pale whitish-brown, sometimes with a broad fuscous central transverse line. Abdomen pale whitish-brown. Legs ochreous-whitish; anterior tibiæ and tarsi ochreous-fuscous. Forewings hardly dilated, costa moderately arched, apex rounded, hindmargin moderately oblique, strongly rounded; pale whitish-brown with conspicuous blackish-fuscous dots; a dot at base of costa, and a second in costal portion of disc near base; a dot in disc before middle, a second in disc beyond middle, and a third on fold obliquely beyond first; a row of four subcostal dots between two-fifths and five-sixths, usually distinct, with a fifth just below fourth; a row of dots close to hindmargin, from beneath apex to beyond anal angle; hindmarginal edge sometimes very faintly pinkish-tinged; cilia pale whitish-brown. Hindwings grey; cilia grey with a pale basal line.

Allied to *E. convictella*, Walk. Brisbane; four specimens.

*EULECHRIA BARYPTERA*, *n. sp.*

Male, 23-26 mm.; female, 30-32 mm. Head and face whitish, faintly ochreous-tinged; apices of sidetufts sometimes fuscous. Palpi whitish; apical half of second joint and terminal joint fuscous anteriorly. Antennæ whitish. Thorax white, irrorated with dark fuscous. Abdomen whitish-grey, with a tawny-fuscous band on each segment; beneath whitish. Legs whitish, anterior pair fuscous. Forewings rather elongate, oblong, costa strongly arched at base, thence almost straight, apex rounded, hindmargin obliquely rounded; white, in parts ochreous-tinged, irrorated with dark-fuscous scales; markings fuscous; a triangular blotch, paler in centre, at base of costa, sharply limited at fold; an irregular blotch with white centre, or partly obsolete, on inner-margin from one-fourth to one-half, its apex reaching to fold; a dot in disc at one-third, a second below this on fold, forming apex of inner-marginal blotch, a third above middle of disc, and two spots usually confluent forming a semilunar mark, in disc at two-thirds; a triangular blotch on centre of costa,

sometimes indistinct ; a broad inwardly oblique streak from costa at five-sixths, from which a strongly outwardly-curved dentate line is continued to anal angle ; a row of small dots along hind-margin ; cilia whitish-grey, with an interrupted median-fuscous line. Hindwings grey, whitish towards base ; cilia grey, with a pale basal line.

In the female the markings are less distinct, and the basal triangular blotch obsolete.

The largest species of the genus, allied to *E. philostaura*, Meyr. Brisbane ; not uncommon.

#### EULECHRIA EUCHLORA, *n. sp.*

Female, 24 mm. Head and face grey. Palpi fuscous ; apex of second joint whitish. Antennæ fuscous. Thorax grey, greenish-tinged, anterior margin dark fuscous. Abdomen whitish-ochreous ; a broad reddish-fuscous band in central portion of each segment ; beneath whitish-ochreous. Legs whitish ; anterior and middle tibiæ and tarsi fuscous. Forewings oblong, costa moderately arched at base, thence almost straight, apex rounded, hind-margin obliquely rounded : whitish irrorated with greenish-grey scales ; a dark fuscous dot at base of inner margin ; a very short dark fuscous line in costal portion of disc near base ; indications of an outwardly oblique greenish-grey fascia from costa at one-fourth, only reaching to fold, and the commencement only of a similarly oblique mark on middle of costa ; an oblique dark fuscous mark in disk before middle representing first discal dot ; a longitudinally elongate dot above middle of disc ; two dots in disc at two-thirds tending to join to form a semilunar mark ; an inwardly oblique line from costa at five sixths, from which is continued a strongly outwardly curved interrupted line to anal angle ; cilia grey, paler towards apices. Hindwings and cilia grey.

Distinguishable by its greenish-grey colouring. Belongs to the same group as the preceding. Brisbane ; one specimen.

#### EULECHRIA CURVILINEA, *n. sp.*

Male and female, 12-16 mm. Head and face white. Palpi white, basal two-thirds of second joint fuscous. Antennæ fuscous, obscurely annulated with whitish. Thorax white, anterior margin broadly fuscous. Abdomen ochreous-fuscous. Legs ochreous whitish ; anterior pair, middle tibiæ, and tarsi ochreous-fuscous, the last obscurely annulated with ochreous-whitish. Forewings hardly dilated, costa gently arched, apex rounded, hindmargin obliquely rounded ; white, sparsely irrorated with ochreous-fuscous scales ; a fuscous spot at base of costa, produced along costal edge ; a rather narrow, curved, inwardly oblique fascia, sometimes obsolete at both extremities, from middle of

costa to inner-margin just before middle, ochreous-fuscous; a broader ochreous-fuscous fascia from costa at four-fifths to anal angle, anterior margin strongly convex, posterior concave or nearly straight, ill-defined; a row of three or four ochreous-fuscous dots, sometimes confluent, parallel to lower two-thirds of hindmargin; hindmarginal edge irregularly fuscous; cilia ochreous-whitish, with an interrupted median fuscous line. Hindwings and cilia grey.

Allied to *E. brachypepla*, Meyr., from which it may be distinguished by the anterior dark margin of thorax, and inwardly oblique curved anterior fascia. Common about Brisbane.

EULECHRIA TETRAPLOA, *n. sp.*

Male, 13 mm. Head and face white. Palpi white, basal two-thirds of second joint ochreous-fuscous. Antennæ fuscous, basal joint white. Thorax white, with a transverse ochreous-fuscous line posterior to middle. Abdomen ochreous-fuscous, tuft ochreous-whitish. Legs ochreous-fuscous. Forewings not dilated, costa gently arched, apex round-pointed, hindmargin very obliquely rounded; white, with three fasciæ and an hindmarginal blotch ochreous-fuscous; first fascia at base, very distinct; second rather narrow, straight, inwardly oblique, from costa at two-fifths to inner margin at two-fifths, strongly dilated on both margins; third broader, from costa before apex to anal angle, produced along costa towards apex, anterior margin convex, posterior sinuate; hindmarginal blotch triangular, very distinct, from just below apex to just above anal angle; cilia white, opposite hindmarginal blotch and at anal angle irrorated with fuscous. Hindwings and cilia grey.

Allied to *E. brachypepla*, Meyr., from which it may be distinguished by the differently shaped fasciæ and the hindmarginal blotch. From *E. epicausta*, Meyr., it may be distinguished by the inwardly oblique anterior fascia; and from *E. schalidota*, Meyr., by the thorax being white anteriorly. Brisbane; one specimen.

OENOCRHOA, *Meyr.*

I have taken *O. lactella*,\* Walk., and *O. homora*, Meyr., n.s., near Brisbane, and have bred both species, the former from *Eucalyptus*, the latter from *Acacia*.

OENOCRHOA OCHROSOMA, *n. sp.*

Female, 17-18 mm. Head and face whitish-grey. Palpi whitish-grey, terminal joint fuscous. Antennæ fuscous. Thorax

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\* In Walker's Catalogue this stands as *lactella*, which is doubtless a printer's error.

dark fuscous, with an irregular central whitish-grey blotch. Abdomen pale ochreous. Anterior and middle legs dark fuscous, middle tibiae and tarsi annulated with whitish-grey; posterior legs ochreous whitish, tarsi fuscous. Forewings elongate, costa moderately arched, apex rounded, hindmargin very oblique; dark fuscous irregularly irrorated with whitish-grey scales; a whitish fascia from costa at one-fourth to inner margin at one-fourth, anteriorly concave, posteriorly convex, moderately broad on costa, narrowing towards inner margin; basal area of disc, and a transverse band beyond fascia free from whitish scales; a dark dot or crescent in disc beyond middle, and a dark line from costa at four-fifths to anal angle, sharply angulated in disc; cilia dark fuscous-grey. Hindwings pale ochreous-yellow; extreme apex pale fuscous; cilia pale fuscous.

Distinguished from all except *O. latella*, Walk., by the yellow hindwings. Brisbane; two specimens in August.

OENOCROA GNOPHODES, *n. sp.*

Male, 14 mm. Head, palpi, and antennae slaty-grey. Palpi with second joint markedly dilated at apex, forming an incipient tuft. Antennal ciliations in male rather long (2). Thorax dark fuscous, with a central median band pale slatey-grey; shoulders pale slatey-grey. Abdomen fuscous. Legs whitish; anterior and middle tibiae and tarsi dark fuscous. Forewings elongate, narrow, costa slightly arched, apex round-pointed, hindmargin very oblique; whitish-slaty-grey; markings dark fuscous, rather obscure; an inwardly oblique fascia from costa at one-third to inner margin at one-fourth; anterior to this some obscure confluent dark markings; indications of an interrupted fascia from costa at four-fifths to anal angle; a series of dark fuscous dots on hindmargin; cilia fuscous, irrorated with pale whitish-slaty-grey. Hindwings pale grey, darker towards hindmargin; cilia, grey. Brisbane; one specimen.

PLACOCOSMA, *Meyr.*

PLACOCOSMA ANTHOPETALA, *Meyr.*

Brisbane.

PLACOCOSMA PHAEINA, *n. sp.*

Male, 12 mm. Head and face snow-white, side-tufts tinged with fuscous. Palpi snow-white; second joint with a fuscous subapical ring; terminal joint fuscous anteriorly and at apex. Antennae white, with dark fuscous annulations, basal joint fuscous. Thorax snow-white, apex of crest golden-ochreous. Abdomen ochreous. Legs whitish-ochreous; anterior tibiae fuscous, anterior tarsi annulated with fuscous. Forewings elongate, costa moderately arched, apex round-pointed, hindmargin very

obliquely rounded; snow-white; with three golden-ochreous fasciæ, first slightly outwardly oblique from costa near base to inner margin at one-sixth, of equal thickness throughout; second from costa at three-fifths to anal angle, somewhat dilated on costa, and constricted in disc; third from apex parallel to hindmargin, ending in a point above anal angle; hindmarginal edge white; cilia fuscous at apex; thence golden-ochreous. Hindwings grey; cilia ochreous.

Distinct and easily recognised. Brisbane; one specimen taken by Mr. Illidge.

LINOSTICHA, *Meyr.*

LINOSTICHA ALBIDA, *n. sp.*

Male and female, 11-15 mm. Head, face, and thorax white. Palpi white; basal two-thirds of second joint pale ochreous-fuscous. Antennæ white. Abdomen ochreous-whitish. Legs ochreous-whitish. Forewings elongate, costa moderately arched, apex acute, hindmargin very oblique; white; with a few scattered fuscous scales; posterior portion of disc and along principal veins faintly ochreous-tinged; cilia ochreous-whitish. Hindwings and cilia white, faintly ochreous-tinged.

Brisbane; nine specimens.

PHLÆOPOLA, *Meyr.*

The following are taken near Brisbane:—*P. turbatella*, Walk.; *P. psephophora*, Meyr.; *P. melanodelta*, Meyr.

PHLÆOPOLA SUBVIRIDELLA, *n. sp.*

Male, 16-19 mm. Head fuscous, face whitish. Palpi fuscous, second joint irrorated with whitish scales, and with a narrow white apical ring. Antennæ whitish, barred above with fuscous. Thorax fuscous; apex of crest and of shoulders white. Abdomen pale ochreous-fuscous. Legs whitish; anterior and middle tibiae and tarsi fuscous, with whitish annulations. Forewings elongate, posteriorly moderately dilated, costa gently arched, apex rounded, hindmargin obliquely rounded; whitish, irregularly irrorated with greenish-grey and fuscous scales, which give rise to markings; a dark fuscous dot at base of costa, a second at base of hindmargin, and a very short narrow dark line in disc outside fold close to base; a dark-fuscous dot in disc before middle, a second beyond middle, and a third on fold immediately below first; there is a tendency to form transverse fasciæ of greenish-grey scales, including the first two dots—these are best marked on costa as dark-greenish-grey dots; a third costal dot just before apex; cilia pale-greenish-grey, bases whitish. Hindwings pale-fuscous, whitish towards base; cilia whitish, at apex fuscous.

Best distinguished by the greenish tint of the forewing. Brisbane; two specimens.

PHLÆOPOLA EUCAPNODES, *n. sp.*

Female, 13-18 mm. Head and face whitish. Palpi whitish; base of second joint and a subapical band dark fuscous; terminal joint with a median dark fuscous band. Antennæ dark fuscous. Thorax dark fuscous, apex of crest and shoulders whitish. Abdomen ochreous-fuscous. Legs ochreous-whitish; anterior tibiæ and tarsi banded with dark fuscous. Forewings elongate, dilated posteriorly, costa gently arched, apex rounded, hindmargin obliquely rounded; white irrorated with fuscous; a dark fuscous dot at base of costa, a second at base of inner margin, and a third confluent with first in basal part of disc; an irregular dark fuscous fascia from costa at one-fourth to inner margin before middle, interrupted in costal part of disc, strongly dilated on inner margin, and enclosing a blackish dot on fold; a dark fuscous blotch on costa beyond middle, connected by a blackish dot with another dark fuscous blotch on anal angle to form a complete fascia; a dark fuscous blotch on costa before apex, with a suffused line toward anal angle; hindmarginal edge mostly dark fuscous; cilia fuscous, at lower half of hindmargin irrorated with white. Hindwings and cilia fuscous.

Brisbane; two specimens.

PHLÆOPOLA BASIGRAMMA, *n. sp.*

Male, 13-21 mm. Head white, anterior part of side-tufts sometimes fuscous; face white. Palpi, basal half of second joint dark fuscous, apical half white; terminal joint white, with an indistinct fuscous band before middle. Antennæ ochreous-fuscous. Thorax dark fuscous, apex of crest and of shoulders white. Abdomen ochreous, beneath whitish. Legs whitish; anterior and middle tibiæ and tarsi fuscous with whitish annulations. Forewings elongate, dilated posteriorly, costa gently arched, apex rounded, hindmargin obliquely rounded; white, irrorated with greyish scales, costal edge and posterior part of disc tinged with pale ochreous; a thick blackish streak from base of costa along fold to one-third, on the centre of the outer surface of this is a blackish projection; from apex of streak a fuscous shade extends to inner margin at two-fifths; a blackish dot on costa at one-third; a blackish dot in disc before middle, a second beyond middle obliquely below first; a straight, dark fuscous fascia from costa at two-thirds to anal angle, containing a black dot on costa and a second in disc; a dark fuscous inwardly oblique spot on costa before apex, from which a fine outwardly curved line is continued to anal angle; hindmarginal edge narrowly fuscous; cilia whitish. Hindwings whitish, suffused with fuscous, especially at apex; cilia towards apex fuscous, with a whitish basal line, towards anal angle whitish.

Distinguished from all but *P. semocausta*, Meyr., by the dark basal line along fold. Brisbane; six specimens.

*PHLŒOPOLA MELANOSPILA, n. sp.*

Male and female, 17-29 mm. Head and face ochreous-fuscous. Palpi ochreous-whitish irrorated with dark fuscous scales, terminal joint dark fuscous except at apex. Antennæ ochreous-fuscous, obscurely annulated with dark fuscous; ciliations two-thirds. Thorax ochreous-fuscous. Abdomen ochreous-fuscous. Legs ochreous-fuscous, tarsi banded with dark fuscous; anterior tibiæ dark fuscous. Forewings moderate, somewhat dilated posteriorly, costa gently arched, apex rounded, hindmargin obliquely rounded; reddish-ochreous fuscous, with scattered whitish and dark fuscous scales; markings blackish-fuscous; a large basal blotch extending from base of costa to two-thirds of inner margin, with a rounded or toothed projection into disc above fold; in the male the basal blotch is uniformly blackish fuscous, in the female partly obscured by the ground-colour, its posterior edge partly bordered with whitish; a suffused spot on costa at one-third; a distinct white-bordered dot in disc at one-third; a large pentagonal blotch from costa at two thirds, reaching more than half across disc; a short whitish-bordered longitudinal line between this and basal blotch, below which is a fuscous suffusion; a suffused spot below costa near apex, from which proceeds a curved series of whitish-bordered dots to near anal angle; cilia whitish-ochreous, with a median fuscous line. Hindwings fuscous-grey; cilia fuscous-grey with an indistinct darker line.

Nearest to *P. melanodelta*, Meyr, but is a much larger insect. Brisbane; six specimens.

*PHLŒOPOLA EUPREPES, n. sp.*

Male, 15 mm. Head and face very pale ochreous-white. Palpi whitish; second joint dark fuscous at base, and with an indistinct subapical fuscous ring; terminal joint with a broad fuscous band before middle. Antennæ blackish, in male with incipient serrations. Thorax blackish-fuscous, a few scattered scales and apex of crest whitish. Abdomen ochreous. Legs ochreous-whitish; anterior and middle tibiæ and tarsi dark fuscous, annulated with whitish. Forewings elongate, posteriorly dilated, costa moderately arched, apex rounded, hindmargin obliquely rounded; very pale ochreous-white, with a few scattered dark fuscous scales; markings dark fuscous; a squarish spot at base of costa; a short very narrow streak near inner margin at base; a broad fascia from costa at one-fourth to middle of inner margin, dilated on fold and broadly dilated on inner margin, costal edge between

this and basal spot is dark fuscous; a second fascia on costa beyond middle to anal angle, very broad on costa, then narrowing and almost interrupted in disc, being connected by a very short oblique bar with a rounded blotch above anal angle; between first and second fascia is a round dot in centre of disc; a third fascia commences by a broad band directed obliquely inwards from costa just before apex, and is continued by a fine line, first obliquely outwards, and then bent sharply and continued parallel to hindmargin to anal angle, where it joins second fascia: a dark fuscous line along hindmargin; cilia, bases barred alternately with whitish and dark fuscous, apices pale fuscous. Hindwings pale fuscous, darker towards apex; cilia fuscous.

A very neat and distinct species. Brisbane; two fine specimens.

PHLÆOPOLA LEUCOCEPHALA, *n. sp.*

Male and female, 13-18 mm. Head and face snow-white. Palpi white, base of second joint and apical one-half or two-thirds of terminal joint dark-fuscous. Antennæ white, sharply annulated with dark-fuscous. Thorax dark-fuscous, shoulders and crest snow-white. Abdomen ochreous. Legs whitish-ochreous; anterior and middle tibiæ and tarsi dark-fuscous, annulated with ochreous-whitish. Forewings elongate, not dilated posteriorly, costa gently arched, apex round-pointed, hindmargin obliquely rounded; snow-white, markings dark-fuscous; a very small spot at base of costa; an inwardly curved streak from inner-margin near base, joining first fascia near costa; a broad oblique fascia from costa at one-fourth to middle of inner-margin; narrower on costa, dilated on inner-margin; a second fascia from costa just beyond middle to anal angle, both fasciæ with irregularly dentate margins; a third broad fascia from costa near apex, inwardly oblique, and coalescing with second at anal angle; cilia white, bases barred with dark-fuscous. Hindwings and cilia dark-grey.

In this species vein seven of forewings is to hindmargin. It appears nearly allied to *P. synchyta*, Meyr. Brisbane; six specimens.

SPHYRELATA, *Meyr.*

*S. ochrophæa*, Meyr., and *S. melanoleuca*, Meyr., are taken about Brisbane.

PILOPREPES, *Meyr.*

The following are taken in the neighborhood of Brisbane:—*P. æmulella*, Meyr.; *P. aristocratica*, Meyr.; *P. lophoptera*, Lower (Trans. Royal Soc., S.A., 1894).



PILOPREPES LUCASII, *n. sp.*

Male, 17-18 mm. Head snow-white, apices of sidetufts orange-fuscous. Face snow-white. Palpi white, apex of terminal joint fuscous. Antennæ white, obscurely annulated with pale-fuscous. Thorax white, more or less irrorated or marked with orange-fuscous, with a posterior dark-fuscous spot; crest orange-fuscous. Abdomen pale-ochreous. Legs whitish; anterior tibiæ and tarsi densely clothed with long hairs, white suffused with grey. Forewings moderate, not dilated, costa moderately arched, slightly dilated with scales at one-half, apex rounded, hindmargin very obliquely rounded; a snow-white basal patch, posterior margin well-defined, from costa at one-fourth obliquely outwards to fold, thence angulated inwards to inner-margin at two-fifths, in this margin are two very prominent tufts of raised scales, one at fold, the other between fold and costa; a dark-fuscous spot at base of costa, and another at base of inner-margin; the white basal patch also contains a purplish-grey transverse band from inner-margin not reaching costa, often broken up into spots, and a pale-ochreous suffusion between this and base near inner-margin, median area of disc purplish-grey, bounded by a line from costa at two-thirds to anal angle, indented in disc and at anal angle; within this is a narrow interrupted white line from costa before middle to inner-margin before anal angle, its outer-margin suffused with orange-fuscous; remainder of disc white, with an interrupted ochreous line along costa, and a subapical orange-fuscous blotch, and a line of fuscous dots along hindmargin; cilia ochreous-whitish, at anal angle dark-fuscous. Hindwings ochreous-yellow; cilia ochreous-yellow suffused with pale-fuscous.

Very distinct. Brisbane, two specimens; first taken by Dr. T. P. Lucas.

PILOPREPES GLAUCASPIS, *n. sp.*

Male, 16 mm. Head white, anterior part of side-tufts reddish-brown. Face white. Palpi whitish, apex of second joint, and all terminal joint except base fuscous. Antennæ whitish; cilia three. Thorax white, anterior part fuscous. Abdomen ochreous-whitish. Legs ochreous; anterior and middle tibiæ and tarsi white, barred with fuscous. Forewings moderate, costa moderately arched at base, with a strong tuft of scales at one-half, thence straight, apex rounded, hindmargin obliquely rounded; white, with scattered, pale reddish-brown scales; a dark fuscous spot at base of costa, and a second in disc close to first; central portion of disc occupied by a large olive-green blotch, which commences in a dark fuscous dot on costa at one-third, rapidly widens in disc, and on inner margin reaches from one-third to just before anal angle, its anterior margin concave, posterior

margin convex, white bordered ; beyond this disc is pale reddish brown, darker towards hindmargin, and contains a curved line of obscure fuscous dots ; costal tuft dark fuscous ; cilia grey, bases barred with fuscous, at anal angle white. Hindwings and cilia grey.

Conspicuously distinct. The antennal ciliations are very long for this genus, but I do not think it necessary to separate it. Vein seven of forewings is distinctly to apex, and the costal tuft is characteristic. One specimen ; taken near Brisbane by Mr. Illidge.

#### TERATOMORPHA, *n. g.*

Head with appressed scales, sidetufts moderate, closely appressed. Antennæ moderate, basal joint stout, pecten absent, ciliations in male unknown. Palpi very long ; second joint very long, horizontally porrected, with a brush-like projection of long scales on inferior margin from one-third to apex, and a smaller brush on middle third of superior margin ; terminal joint shorter, ascending, its middle third thickened with loose scales, apical third smooth, apex acute. Thorax with a posterior crest. Forewings moderate ; costa with tufts of scales ; hindmargin sinuate, not oblique ; disc with strong tufts of raised scales. Hindwings as broad as forewings, ciliations one-fourth. Abdomen (broken). Anterior tibiæ but slightly thickened. Forewings with vein 7 to costa, 2 from before angle of cell. Hindwings normal.

Perhaps an extreme development of *Piloprepes*.

#### TERATOMORPHA COELIOTA, *n. sp.*

Female, 27-30 mm. Head and face ochreous-whitish. Palpi whitish ; second joint irroccated with fuscous scales, except on tufts ; terminal joint with a broad dark-fuscous ring before middle, a small fuscous ring beyond middle, and a third at apex. Antennæ whitish with fuscous annulations. Thorax ochreous-whitish with a few dark fuscous scales. Legs ochreous-whitish banded with fuscous. Forewings elongate-oblong, costa excavated in middle and again before apex, before each excavation is a strong tuft of scales, apex rounded, hind-margin sinuate not oblique ; ochreous-whitish ; a broad dark-fuscous band, partly interrupted by ground-color, from costa at one-sixth, towards, but ceasing abruptly before, middle of disc ; a few scattered dark-fuscous scales ; a dark-fuscous blotch at apex ; in oblique light some of the fuscous scales have a metallic iridescence ; cilia fuscous. Hindwings ochreous-whitish ; a dark-fuscous spot at apex ; cilia ochreous-whitish, at apex fuscous.

This curious species is evidently a mimic of birds' droppings.

Bowen, North Queensland, two specimens in the collection of the Brisbane Museum.

PHYLLOPHANES, *n. g.*

Head loosely haired, sidetufts moderate, spreading. Antennæ moderate, basal joint stout, pecten absent, ciliations in male unknown. Palpi rather long, second joint somewhat exceeding base of antennæ, densely scaled beneath, scales forming a large apical tuft, terminal joint much shorter, moderate, recurved. Thorax smooth. Forewings moderate, apex pointed, hindmargin only slightly oblique, with a strong tuft of scales on costa. Hindwings narrower than forewings, cilia at apex long forming a hook-like projection, basal cilia one-half. Abdomen moderate. Anterior tibiæ not dilated. Forewings with vein seven to apex, two from before angle of cell. Hindwings normal.

The tufted palpi recalls *Palparia*, and the costal tufts *Piloprepes*, but I doubt whether it is really closely related to either genus.

PHYLLOPHANES DYSEURETA, *n. sp.*

Female, 22 mm. Head, face, and thorax whitish, irrorated with reddish-brown. Palpi anteriorly reddish-brown, posteriorly whitish; terminal joint with a median white ring; tuft two-fifths length of terminal joint. Antennæ pale-fuscous. Abdomen whitish grey. Legs ochreous-whitish; anterior tibiæ and tarsi reddish-brown. Forewings elongate oblong, costa moderately arched, strongly dilated with scales before middle, apex pointed, subrectangular, hindmargin slightly oblique, lower half obliquely rounded; whitish thickly irrorated with reddish-brown scales; a few fuscous scales in disc, on fold, and about anal angle; cilia whitish. Hindwings whitish-grey; cilia whitish, apical tuft fuscous, from this a median fuscous line can be traced for a short distance.

Not like any other species. When the wings are closed the apical tufts of hindwings project beneath costa of forewings, giving the appearance of a second costal tuft. The moth then closely resembles a piece of crumpled leaf. Brisbane; one specimen from *Eugenia*.

PYCNOCERA, *n. g.*

Head with appressed scales, side-tufts moderate, closely appressed. Antennæ moderately long, in male very much thickened, serrate (one-third), and densely ciliated (one and a half); with strong pecten. Palpi rather short, second joint not reaching base of antennæ, with appressed scales, terminal joint less than half first, moderately stout, recurved. Thorax smooth. Forewings moderate, hindmargin scarcely oblique, rounded beneath. Hindwings narrower than forewings; cilia one-third. Abdomen rather stout. Forewings with vein seven to hindmargin, two from just before angle of cell. Hindwings normal.

Immediately distinguished by the greatly thickened antennæ of the male.

PYCNOCERA HYPOXANTHA, *n. sp.*

Male, 21-23 mm. Head, face, and palpi ochreous-fuscous. Antennæ dark fuscous. Thorax fuscous. Abdomen fuscous, apical tuft and basal tufts ochreous. Legs fuscous, anterior and middle tibiæ and tarsi annulated with ochreous; posterior tibiæ and tarsi ochreous. Forewings oblong, not dilated, costa moderately arched, apex rounded, hindmargin scarcely oblique, rounded beneath; dark fuscous thickly irrorated with whitish scales, towards inner margin and about centre of disc these are less numerous or wanting; an oval dark fuscous blotch from anal angle, nearly reaching costa at two-thirds; a narrow fuscous line from costa at five-sixths, confluent with blotch at anal angle; cilia fuscous. Hindwings, basal half clear ochreous-yellow; apical and hindmarginal portions fuscous; cilia fuscous with paler basal line, at anal angle ochreous-yellow.

Brisbane; three male specimens.

NEPHOGENES, *Meyr.*

*Nephogenes fedatella*, Walk. Brisbane.

*Nephogenes atmopis*, Meyr. Taken by Meyrick at Toowoomba

NEPHOGENES VARIABILIS, *n. sp.*

Male, 19-23 mm. Head and face ochreous-whitish. Palpi ochreous-whitish, second joint sometimes partly suffused with fuscous. Antennæ whitish, sometimes annulated with fuscous, basal joint fuscous; ciliations in male two and a-half. Thorax pale ochreous-whitish, more or less suffused with fuscous; anterior half of shoulders fuscous. Abdomen ochreous-whitish. Legs ochreous-whitish; anterior and middle tibiæ and tarsi dark fuscous, annulated with whitish. Forewings elongate, narrow, costa moderately arched, apex round-pointed, hindmargin extremely obliquely rounded; very pale ochreous-whitish, more or less irrorated with fuscous; markings fuscous; a triangular patch on costa before middle, reaching one-third across disc; a dot in disc at one-third, a second slightly beyond this on fold, a third at apex of costal triangle, and several confluent, forming a semilunar mark in disc at two-thirds; a short, inwardly oblique streak from costa at five-sixths, from which proceeds a line sharply bent in disc, and continued parallel to hindmargin to above anal angle, where it sometimes ends in a fuscous spot, but this is only occasionally present; a series of fine dots around apical and hindmarginal edge; cilia whitish, with two fuscous lines, sometimes interrupted or obsolete. Hindwings pale grey, darker towards apices; cilia whitish, with a pale grey line at one-third.

A variable species. The above description is taken from ten specimens, all males, of which scarcely two are exactly alike. They include two well-marked varieties; in (1) the costal triangle is very well marked, and there is an equally distinct fuscous line along central half of inner-margin, discal dots and posterior line are obsolete, the latter being represented by a conspicuous blackish spot above anal angle; in (2) the disc and more especially its basal portion are extensively suffused with fuscous, and an inwardly concave fuscous shade unites the two extremities of the posterior line.

In the narrow forewings it resembles *N. apora*, Meyr., from which it may be distinguished by the somewhat ochreous-tinged forewings. From other species it may also be distinguished by the absence of any basal patch or fascia (except in conjunction with a general fuscous suffusion). The long antennal ciliations of the male are also a point of distinction. Brisbane; not uncommon.

#### PHILOBOTA, *Meyr.*

This large genus is conspicuously poorly represented in the neighbourhood of Brisbane. I am able to record the following:—*P. chionopectera*, Meyr.; *P. pruinosa*, Meyr.; *P. adaptatella*, Walk.; *P. xanthiella*, Walk.; *P. fascialis*, Fab.; *P. tentatella*, Walk.; *P. melanoploca*, Meyr.; *P. pulverea*, Meyr.

Three additional species have been taken on Stradbroke Island:—*P. irruptella*, Z.; *P. chrysopotama*, Meyr.; *P. pretiosella*, Walk.

Meyrick records *P. erebodes*, Meyr., and *P. calamava*, Meyr., from Toowoomba.

#### PHILOBOTA XIPHERES, *n. sp.*

Male, 19-20 mm. Head and face white, very faintly ochreous-tinged. Palpi, antennæ, and thorax white. Abdomen whitish-grey. Legs whitish-ochreous. Forewings moderate, not dilated, costa gently arched, apex round-pointed, hindmargin very obliquely rounded; snow-white; a fuscous streak along costa almost to apex, attenuated at base and extremity; cilia white. Hindwings and cilia grey.

Closely resembles the male of *P. chionopectera*, Meyr., but may be at once distinguished by the much darker hindwings. Brisbane; two specimens.

#### PHILOBOTA LONCHOTA, *n. sp.*

Male, 18 mm. Head, face, and thorax ochreous. Palpi anteriorly and externally fuscous, posteriorly and internally ochreous. Antennæ fuscous. Abdomen ochreous. Legs ochreous; anterior and middle tibiæ and tarsi fuscous. Forewings moderate, not dilated, costa gently arched, apex round-pointed, hindmargin

obliquely rounded ; ochreous-whitish ; a dark fuscous streak along costa to three-fourths, attenuated at base and extremity ; cilia ochreous-whitish. Hindwings and cilia grey.

Distinguished from the preceding by the ochreous-tinged forewings, and shorter costal streak. Brisbane ; two specimens.

*PHILOBOTA PERIXANTHA, n. sp.*

Male, 18-19 mm.; female, 25-27 mm. Head and face ochreous. Palpi whitish-ochreous. Antennæ whitish, ciliations two. Thorax white. Abdomen ochreous-whitish. Legs ochreous-whitish ; anterior and middle tibiae and tarsi suffused with fuscous. Forewings elongate, not dilated, costa gently arched, apex round-pointed, hindmargin obliquely rounded ; white ; base of costa dark fuscous ; costal and hindmarginal edges narrowly ochreous ; cilia ochreous. Hindwings pale grey ; cilia whitish-ochreous.

Brisbane ; taken commonly.

*PHILOBOTA ORPHNITES, n. sp.*

Male, 17-22 mm.; female, 23-25 mm. Head and face white. Palpi whitish, anterior surface of second joint except apex, and of terminal joint pale fuscous. Antennæ whitish. Thorax white. Abdomen whitish. Legs whitish. Forewings elongate, not dilated, costa gently arched, apex round-pointed, hindmargin obliquely rounded ; white ; basal fifth of costal edge dark fuscous ; some pale fuscous suffusion along costa ; discal dots dark fuscous, first at one-third, second obliquely beyond first on fold, third beyond second above fold often absent, fourth above centre of disc, and three others forming a crescent at two-thirds ; an inwardly oblique streak from costa at five-sixths, sharply bent in disc and continued as a series of fine dots parallel to hindmargin to anal angle, this posterior line is often obsolete ; a series of dots often obsolete along apical sixth of costa and hindmargin ; cilia whitish. Hindwing and cilia whitish-grey.

Brisbane ; taken commonly.

*PHILOBOTA ORPHNÆA, n. sp.*

Male and female, 17-20 mm. Head and face ochreous-whitish. Palpi ochreous-whitish, basal half of anterior surface of second joint sometimes fuscous. Antennæ ochreous-fuscous. Thorax ochreous-whitish, with a transverse fuscous band. Abdomen ochreous-fuscous. Legs ochreous-whitish. Forewings moderate, posteriorly dilated, costa gently arched, apex round-pointed, hindmargin obliquely rounded ; ochreous-whitish ; more or less suffused with fuscous scales—these sometimes form an irregular blotch in centre of disc above fold ; a fuscous dot before middle of disc, a second beyond middle, and a third on fold obliquely

below first; a more or less obsolete broken fuscous line from costa at five-sixths parallel to hindmargin to before anal angle; cilia ochreous-whitish. Hindwings and cilia grey.

Brisbane; taken commonly.

PHILOBOTA LUNATA, *n. sp.*

Male and female, 16-18 mm. Head anteriorly snow-white, posteriorly dark-fuscous. Face snow-white. Palpi, basal third of second joint dark-fuscous, remainder snow-white; terminal joint fuscous anteriorly, white posteriorly. Antennæ dark-fuscous. Thorax snow-white, anterior margin dark-fuscous. Abdomen ochreous. Legs ochreous-whitish; anterior tibiæ and tarsi fuscous. Forewings moderate, not dilated, costa gently arched, apex round-pointed, hindmargin moderately oblique; a snow-white blotch on basal one-third of inner-margin, with a rounded outline extending beyond fold; a fuscous longitudinal bar from base of costa separates this from a triangular costal white blotch, extending on costa from one-fifth to three-fifths, its apex not reaching middle of disc; an oblong inwardly oblique white blotch from costa before apex; a suffusedly outlined white triangular marking at anal angle, and a white line on middle third of hindmargin; remainder of disc fuscous or reddish-fuscous, irrorated with white; cilia dark-fuscous, on middle third of hindmargin and at anal angle pure white. Hindwings ochreous, irrorated with fuscous towards apex; cilia pale-ochreous, at apex fuscous.

Brisbane; five specimens.

PHILOBOTA CHRYSANTHES, *n. sp.*

Male and female, 20-22 mm. Head orange-yellow. Face dark fuscous with some orange-yellow scales. Palpi, anterior surface dark fuscous, extreme base of second joint yellow; posterior surface yellow. Thorax fuscous. Abdomen ochreous-fuscous. Legs dark fuscous, posterior tibiæ and tarsi ochreous on upper surface. Forewings moderate, somewhat dilated posteriorly, costa gently arched, apex round-pointed, hindmargin obliquely rounded; deep yellow; base of costa dark fuscous at edge; a fuscous line from centre of base to costa at three-fourths, often obsolete except near base; a second line occasionally present or wholly or partially obsolete from base to anal angle, parallel to and below fold; a fuscous hindmarginal blotch, its anterior margin strongly convex, and enclosing in its lower part a deep yellow spot which may be partly confluent with ground color of disc; cilia dark fuscous. Hindwings dark fuscous; more or less irrorated with yellowish scales; cilia dark fuscous.

Nearest *P. auriceps*, Butler. Ballandean (2,500 feet), near

Wallangarra, Queensland; four specimens in January and February.

*PHILOBOTA SOPHIA, n. sp.*

Male, 19-25 mm. Head orange-yellow. Face dark fuscous. Palpi second joint dark fuscous, apex yellowish; terminal joint pale yellowish. Antennæ dark fuscous. Thorax orange-yellow, with a central fuscous spot. Abdomen dark fuscous, tuft ochreous. Legs dark fuscous; posterior tibiæ and tarsi pale ochreous on upper surface. Forewings elongate, somewhat dilated posteriorly, costa gently arched, apex round-pointed, hindmargin obliquely rounded; white; a broad hindmarginal streak, and middle half of costa orange-yellow; extreme base dark fuscous; from this a broad dark fuscous streak extends at first on, and then just beneath, costa to three-fifths; a similar inwardly oblique streak from costa before middle, terminating abruptly on fold at one-third; between this and base is an orange-yellow streak in costal portion of disc; from oblique streak just above fold proceeds a longitudinal streak twice bent in disc at two-thirds, and prolonged to apex; a streak from before apex to anal angle, sometimes connected with the preceding above anal angle; cilia at apex dark fuscous, thence orange-yellow. Hindwings grey; cilia ochreous.

A very distinct and handsome species, nearer to *P. ida*, Lower, than to any other. Armidale (3500ft.), New South Wales - three specimens in October.

*PHILOBOTA OCULARIS, n. sp.*

Male and female, 16-17 mm. Head, face, thorax, and palpi pale yellow. Antennæ greyish. Abdomen grey. Legs fuscous. Forewings moderate, not dilated, costa gently arched, apex round-pointed, hindmargin nearly straight, slightly oblique; pale yellow; costal edge fuscous, darker towards base; a very strongly inwardly-curved fuscous fascia from costa at five-sixths to anal angle; hindmarginal edge narrowly fuscous; cilia fuscous. Hindwings and cilia fuscous-grey.

Differs from the rest of the genus in the short antennal ciliations of the male (one-half); but it does not appear necessary to separate it at present. There is a strong antennal pecten, and second joint of palpi considerably exceeds base of antennæ. Specifically it resembles *Coesyra ocellaris*, Meyr. Charters Towers (Queensland), two specimens in March.

*COMPSOTROPHA, Meyr.*

*Compsotropha strophella, Meyr.* Brisbane.



COMPSOTROPHA CHRYSOZONA, *n. sp.*

Male and female, 18-19 mm. Head black; face yellowish. Palpi second joint considerably exceeding base of antennæ, white; terminal joint fuscous. Antennæ (ciliations two) ochreous-whitish, annulated with black. Thorax ochreous-yellow. Abdomen fuscous. Legs ochreous-yellow; anterior tibiæ fuscous; posterior tarsi barred above with fuscous. Forewings moderate, costa gently arched, apex round-pointed, hindmargin sinuate, oblique; ochreous-yellow, towards base deep yellow; with four blackish-fuscous faciæ; first occupies basal fifth of disc; second inwardly oblique from middle of costa to middle of inner margin; third confluent with second on costa, to anal angle; fourth along hindmargin from apex to anal angle; cilia blackish-fuscous at apex and anal angle, along middle third of hindmargin ochreous-yellow. Hindwings dark fuscous; costal margin and base suffused with orange-yellow; cilia dark fuscous.

A very distinct insect not nearly related specifically to any other. Brisbane; four specimens in November.

PHILONYMPHA, *Meyr.*

*Philonympha hololenca*, *Meyr.* Brisbane.

PELTOPHORA, *Meyr.*

The following have been taken near Brisbane:—*P. carphalea*, *Meyr.*; *P. proximella*, *Walk.*; *P. basiplaga*, *Walk.*; *P. conjunctella* *Walk.*; *P. privatella*, *Walk.*; *P. psammochroa*, *Lower.*

*P. argutella*, *Z.*, and *P. marionella*, *Newm.*, have been taken on Stradbroke Island.

SAROPLA, *Meyr.*

*S. cleronoma*, *Meyr.*, Brisbane.

*S. coelatella*, *Meyr.*, is recorded by *Meyrick* from Toowoomba.

CORETHROPALPA, *n. g.*

Head with loosely appressed scales, side-tufts rather large, meeting above. Antennæ in male moderate, shortly serrated, shortly and evenly ciliated, three-fourths, with moderate pecten. Palpi long, second joint much exceeding base of antennæ, horizontally porrected, clothed anteriorly with long scales expanding above and beneath to form apical tufts, of these the inferior is much the longer; terminal joint shorter than second, slender, obliquely ascending, partly concealed in apical tuft. Thorax smooth. Forewings elongate, apex pointed, hindmargin very oblique. Hindwings as broad as forewings, elongate-ovate, hindmargin rounded, cilia three-fourths. Abdomen moderate. Posterior tibiæ clothed with long hairs. Forewings with vein

seven to hindmargin, two from before angle of cell. Hindwings normal.

Closely allied to *Phryganeutis*, Meyr., which it resembles in the peculiar palpi, but differs in the short antennal ciliations.

CORETHROPALPA FALCATA, *n. sp.*

Male and female, 16-19 mm. Head and face white. Palpi white, inferior tuft almost as long as terminal joint, external surface of second joint fuscous beneath, white above; terminal joint fuscous. Antennæ white above, fuscous beneath. Thorax white; shoulders pale fuscous. Abdomen whitish. Legs whitish. Forewings elongate, narrow, costa gently arched, more strongly towards apex, apex acute, slightly falcate, hindmargin sinuous, very oblique; pale fuscous, with longitudinal white lines along veins; a double costal streak, a strong subcostal streak with branches along venules, a fine median streak with fine streaks along median venules, a rather strong streak in basal part of disc beneath fold; a white line along hindmargin; cilia white with basal and apical dark fuscous lines, and a dark fuscous streak just above apex. Hindwings pale grey; cilia pale grey, apices white, a fuscous basal line in apical half of hindmargin.

Brisbane; observed flying low among grass and herbage in August in numbers. Superficially, its markings resemble those of one of the *Crambidae*.

PLEUROTA, *Hb.*

The following are taken about Brisbane:—*P. brevicittella*, Walk.; *P. peloxantha*, Meyr.; *P. psammoxantha*, Meyr.

CÆRANICA, *Meyr.*

*Cæranica isabella*, Newm. Brisbane.

CÆSYRA, *Meyr.*

The following are taken about Brisbane:—*C. dichroëlla*, Z.; *C. iozona*, Meyr.; *C. cyclotoma*, Meyr.; *C. acrotopa*, Meyr.; *C. ochroptera*, Meyr.; *C. amyloides*, Meyr.; *C. ergatis*, Meyr.; *C. gephyrota*, Meyr.; *C. innumera*, Meyr.; *C. leptospila*, Meyr.

Meyrick also records *C. omichlota*, Meyr., from Rosewood; and *C. hemiphragma*, Meyr., from Toowoomba.

CÆSYRA SPECTABILIS, *n. sp.*

Male, 17 mm. Head pale yellow; face and palpi yellowish. Antennæ fuscous. Thorax dark fuscous. Abdomen fuscous. Legs fuscous. Forewings elongate, costa scarcely arched, apex round-pointed, hindmargin oblique, almost straight; yellow; base narrowly dark fuscous; a broad fuscous hindmarginal band,

bounded anteriorly by an almost straight edge from costa at two-thirds to before anal angle; almost in the centre of this band is a suffusedly outlined yellow spot; cilia fuscous. Hindwings and cilia fuscous.

Brisbane; one specimen taken by Mr. Illidge.

COESYRA DICOELA, *n. sp.*

Male and female, 14-16 mm. Head, face, and palpi yellow. Antennæ fuscous. Thorax yellow with an anterior fuscous line. Abdomen dark-grey, beneath whitish-ochreous. Legs whitish-ochreous. Forewings moderate, costa gently arched, apex round-pointed, hindmargin almost straight, oblique; yellow; costal edge near base fuscous; a slender purple-fuscous fascia from costa at one-third to inner margin slightly before middle, slightly outwardly curved; a second similar fascia from costa near apex to anal angle, inwardly curved; a pale purple-fuscous suffusion along hindmargin; cilia yellow. Hindwings dark-grey; cilia dark-grey with a pale basal line.

Allied to *C. anthodora*, Meyr. Brisbane; five specimens.

COESYRA CHRYSOCOLLA, *n. sp.*

Male and female, 11-12 mm. Head golden-yellow, face reddish-ochreous. Palpi ochreous-whitish, terminal joint pale fuscous. Antennæ fuscous. Thorax dark fuscous. Abdomen fuscous. Legs whitish-ochreous; anterior and middle tibiæ and tarsi suffused with fuscous. Forewings elongate, narrow, costa almost straight, apex round-pointed, hindmargin very obliquely rounded; bright golden-yellow; a narrow dark fuscous basal fascia, a slender fuscous line along costa; a broad fuscous hindmarginal band, anterior margin of this slightly convex, from costa at three-fourths to before anal angle; cilia fuscous. Hindwings and cilia dark-grey.

Brisbane; two specimens.

EPIPYRGA, *Meyr.*

*E. agaclita*, Meyr., is recorded by Meyrick from Rosewood.

OXYTHECTA, *Meyr.*

*O. hieroglyphica*, Meyr., and *O. acceptella*, Walker. Brisbane.

CREPIDOSCELES, *Meyr.*

*C. eostephana*, Meyr., and *C. exanthema*, Meyr. Brisbane.

OCYSTOLA, *Meyr.*

The following have been taken near Brisbane:—*O. thiasotis*, Meyr.; *O. oxytora*, Meyr.; *O. acroantha*, Meyr.; *O. psamathina*,

Meyr.; *O. monostropha*, Meyr.; *O. paulinella*, Newm.; *O. neurota*, Meyr.

Meyrick records *O. suppressella*, Walk., from Rosewood, and *O. protosticha*, Meyr., from Toowoomba.

#### PAROCYSTOLA, n. g.

Head smooth, side-tufts moderate, loose. Antennæ in male with moderate ciliations (one and a-half); basal joint without pecten, rarely with a few scales only. Palpi rather short; second joint barely reaching base of antennæ, with appressed scales, somewhat loose beneath towards apex; terminal joint shorter than second, moderately slender, recurved. Thorax smooth. Forewings moderate, apex acute, hindmargin straight, oblique. Hindwings elongate-ovate, cilia one. Abdomen moderate. Posterior tibiæ clothed with moderately long hairs above. Forewings with vein seven to hindmargin, two from before angle of cell. Hindwings normal.

A development of *Ocystola*, from which it is distinguished by the absence of the pecten, and the shorter antennal ciliations. The latter character serves to separate it from *Compsotroppha*, to which it is not really very closely allied.

#### PAROCYSTOLA LEUCOSPORA, n. sp.

Male and female, 13-16 mm. Head, face, and thorax pale ochreous-grey. Palpi and antennæ greyish. Abdomen ochreous-whitish. Legs ochreous-whitish. Forewings moderate, costal gently arched, apex acute, hindmargin straight, or slightly sinuate; pale greyish, tinged with ochreous; an ill-defined fuscous line along costa; extreme costal edge pinkish-ochreous; an occasional ill-defined fuscous suffusion on inner margin at one-third; a fuscous dot in disc at one-third, sometimes obsolete, a second at two-thirds, and a third on fold obliquely below first; the latter two often accompanied by two white spots very variable in their development; a line of fuscous dots from costa at two-thirds, angulated in disc to anal angle, each fuscous dot accompanied by a white dot; a dark fuscous line around apex and along hindmargin; cilia pinkish-ochreous, at apex and anal angle fuscous. Hindwings grey, towards base ochreous-tinged; cilia grey.

Brisbane; from September to November; not uncommon. I have bred one specimen from *Acacia Cunninghami*.

#### MACHÆRITIS, Meyr.

*M. calligenes*, Meyr.; *M. melanospora*, Meyr.; *M. indocta*, Meyr. Brisbane.

#### LEPTOCROCA, Meyr.

*L. sanguinolenta*, Meyr. Brisbane.

## OECOPHORA, Z.

*O. hemisphaerica*, Meyr. Brisbane.

Meyrick also records *O. lagara*, Meyr., from Rosewood, and *O. eremaea*, Meyr., from Toowoomba.

OECOPHORA SPHAEROIDES, *n. sp.*

Female, 14-15 mm. Head and face ochreous-whitish. Palpi ochreous-whitish; terminal joint and basal third of second joint fuscous. Antennæ ochreous-whitish annulated with fuscous. Thorax fuscous. Abdomen ochreous-fuscous. Legs ochreous-whitish; anterior pair fuscous. Forewings moderate, costa rather strongly arched, apex rounded, hindmargin obliquely rounded; ochreous-whitish; a fuscous spot at base of costa; a dark fuscous dot in disc at one-third, a second obliquely below first on fold, two confluent dots placed transversely in disc at two-thirds; a dark fuscous dot at anal angle; a fuscous shade in outer part of disc, sharply limited anteriorly by an outwardly oblique, outwardly curved line from costa beyond middle through posterior discal dots to before anal angle; posteriorly this shades off into ground colour; a submarginal line of confluent dark fuscous dots along posterior one-third of costa and hindmargin; cilia ochreous-whitish, at anal angle pale fuscous. Hindwings and cilia grey.

Brisbane; two specimens taken by Mr. Illidge.

OECOPHORA HEMILEUCA, *n. sp.*

Female, 17 mm. Head and face snow-white. Palpi white; basal half of second joint fuscous. Antennæ dark fuscous. Thorax dark fuscous, with a large snow-white posterior spot. Abdomen ochreous-whitish. Legs ochreous-whitish. Forewings elongate, costa almost straight, apex tolerably acute, hindmargin very obliquely rounded; snow-white; a broad fuscous streak from base along costa to one-third; thence proceeds a fuscous fascia, slightly outwardly oblique, to inner margin before middle, its anterior edge sharply defined, posterior edge suffused; a darker dot on fold in posterior edge of this fascia; a broad fuscous fascia from costa near apex, narrowing abruptly to a point at anal angle; between the two fasciæ are some obscure fuscous markings in costal portion of disc; a fuscous spot on hindmargin below middle; cilia fuscous, just above anal angle ochreous-whitish. Hindwings grey, basal half whitish-ochreous; cilia, apical third fuscous, remainder whitish-ochreous.

Very distinct. In the absence of the male the generic position of this species cannot be exactly determined. In the specimen examined, which is rather worn, I cannot distinguish any trace of a pecten; further observation will be required to determine whether this is really absent. Brisbane; one specimen taken by Mr. Illidge.

CROSSOPHORA, *Meyr.*

*C niphadia*, *Meyr.* Brisbane.

MACROBATHRA, *Meyr.*

The following have been taken in the neighbourhood of Brisbane:—*M. chrysotoxa*, *Meyr.*; *M. desmotona*, *Meyr.*; *M. mesopora*, *Meyr.*; *M. chlorosoma*, *Meyr.*; *M. niphadobola*, *Meyr.*; *M. argonota*, *Meyr.*; *M. alternatella*, *Walk.*; *M. xuthocoma*, *Meyr.*; *M. crymalea*, *Meyr.*; *M. melanergyra*, *Meyr.*; *M. myriophthalma*, *Meyr.*; *M. chrysospila*, *Meyr.*; *M. diplochrysa*, *Lower*.

*Meyrick* also records *M. broutodes*, *Meyr.*, from Rosewood, and *M. monostadia*, *Meyr.*, and *M. nephelomorpha*, *Meyr.*, from Toowoomba.

I have bred a specimen of *M. xuthocoma* from *Acacia penninervis*; and a series of *M. chrysospila* from *Acacia complanata* and *A. decurrens*.

*M. diplochrysa*, *Lower*, I have bred abundantly from *Acacia Cunninghamsi* in September, but have never observed in the free state.

MACROBATHRA PUNCTICULATA, *n. sp.*

Male, 15 mm. Head and thorax dark fuscous. Face ochreous-whitish. Palpi ochreous-whitish; second joint irrorated with fuscous; terminal joint dark fuscous except at base and apex. Antennæ dark fuscous. Abdomen fuscous. Legs fuscous, annulated with ochreous-whitish. Forewings elongate-lanceolate; dark fuscous; an oblong, ochreous-white, outwardly oblique spot from costa at one-fourth, reaching fold; an ochreous-white dot on middle of costa, a conspicuous white spot on costa at three-fourths; a minute ochreous-white dot in centre of disc at one-third, a second on fold obliquely beyond first, a third in middle of disc, and a fourth in disc at two-thirds; cilia fuscous. Hindwings and cilia grey.

Brisbane; one specimen, bred from *Acacia sp.* in October.

MACROBATHRA CHRYSOBAPHES, *n. sp.*

Male and female, 13-16 mm. Head and face ochreous-yellow. Palpi ochreous-whitish; second joint fuscous anteriorly; terminal joint fuscous, except at base and apex. Thorax pale purple-fuscous, with a yellowish anterior and posterior spot. Abdomen fuscous, towards base ochreous-yellowish. Legs dark-fuscous, banded with whitish-yellowish. Forewings elongate-lanceolate; pale purple-fuscous; markings deep ochreous-yellow; a small basal spot; a broad outwardly oblique fascia from costa at one-fifth, not reaching inner-margin narrowest at costa, broad on fold; a rather large spot on costa before middle, and another of

equal size on inner-margin opposite ; a small round spot on disc at two-thirds ; a rather large spot on costa at four-fifths, and a smaller spot on anal angle ; apical portion of disc darker fuscous ; cilia fuscous, beneath anal angle paler, on costal spot yellow. Hindwings and cilia grey.

Brisbane ; six specimens bred from *Acacia* sp. Closely allied to *M. chrysoaspila*, from which it is readily distinguished by the paler ground-color, deeper yellow markings, and especially by the broader fascia. I have bred a large number of the latter species, and find these points of distinction constant.

MACROBATHRA ROSEA, n. sp.

Male and female, 10-13 mm. Head dull rosy ; face paler rosy. Palpi, second-joint rosy-whitish, irrorated with dark fuscous ; terminal joint dark fuscous, irrorated with rosy-whitish, apex whitish. Antennæ fuscous, obscurely annulated with whitish. Thorax dull rosy irrorated with dark fuscous. Abdomen fuscous. Legs fuscous ; anterior and middle pair banded with rosy-whitish ; posterior with whitish. Forewings elongate-lanceolate ; pale rosy ; base narrowly blackish-fuscous ; with four transverse blackish-fuscous fasciæ, more or less suffused and interrupted in disc ; first from costa at one-fifth to inner margin at one-fourth ; second from costa at two-fifths to middle of inner margin ; third from costa at three-fifths to before anal angle ; fourth from costa before apex to hindmargin just above anal angle ; cilia ochreous with a fuscous basal line, on costa and just above and below anal angle fuscous. Hindwings and cilia grey.

A pretty and very distinct species, Brisbane ; six specimens.

The following are new localities for the species mentioned. Ballandean (2500ft.) is seven miles north of Wallangarra on the Queensland border.

*Eochrois laetiferana*, Ballandean.

*Zonopetala divisella*, Ballandean.

*Heliocausta severa*, Ballandean.

*Heliocausta limbata*, Armidale (3500ft.), New South Wales.

*Hoplitica pudica*, Ballandean.

*Hoplitica rufa*, Ballandean.

*Eulechria puellaris*, Ballandean.

*Eulechria epicauستا*, Ballandean.

*Eulechria leucopelta*, Ballandean.

*Eulechria habrophanes*, Ballandean.

*Eulechria xylopterella*, Armidale (3500ft.), New South Wales.

*Sphyrelata indecorella*, Ballandean.

*Nephogenes apora*, Ballandean.

*Philobota arabella*, Armidale.

*Philobota anchylotoxa*, Armidale.

- Philobota chrysopotama*, Armidale.  
*Philobota monoloncha*, Armidale.  
*Philobota pruinosa*, Armidale.  
*Philobota catachrysa*, Armidale.  
*Philobota automina*, Sydney, New South Wales.  
*Philobota occidua*, Ballandean.  
*Philonympha leptostola*, Ballandean.  
*Oxythecta alternatella*, Armidale.  
*Oxythecta zonoteles*, Armidale.  
*Oxythecta acceptella*, Armidale.
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FURTHER NOTES ON AUSTRALIAN COLEOPTERA,  
WITH DESCRIPTIONS OF NEW GENERA AND  
SPECIES.

By the Rev. T. BLACKBURN, B.A.

[Read April 14, 1896.]

XIX.

BUPRESTIDÆ.

CALODEMA.

*C. Wallacei*, Deyr. There is an example of this insect in Mr. French's collection, which that gentleman informs me was taken in N. Queensland.

STIGMODERA.

*S. magnifica*, sp. nov. Sat lata; metallico-viridis, prothoracis disco elytrisque violaceo-purpureis, his fascia mediana communi sat lata aurantiaca ornatis; capite longitudinaliter concavo, antice grosse leviter (postice magis profunde minus grosse) punctulato; prothorace fortiter transverso, acervatim sat fortiter punctulato, antice valde angustato, lateribus mox ante basin fortiter dilatato-rotundatis; elytris fortiter striatis, striis leviter punctulatis, interstitiis convexis fere ut striæ punctulatis, lateribus postice crenulatis, apice breviter bispinoso. Long., 10 l.; lat.,  $4\frac{1}{5}$  l.

This magnificent insect is quite distinct by its color and markings from all others known to me. It should be placed I think near *S. alternozona*, Thoms.

N. Queensland; in the collection of Mr. French.

ELATERIDÆ.

TETRIGUS.

This genus is new to the Australian fauna. The antennæ are of very characteristic form in their lamellæ being given off from the *base* (not the apex) of the lamellated joint. The antennæ of the following species are exactly like those of *T. parallelus*, Cand. (as figured, Mon. Elat., vol. I., pl. v., fig. 5a), except in their apical joint being differently formed. The head too is very distinctive, the forehead being abruptly truncate in front, with the part which Dr. Candèze calls the "plaque nasale" abruptly perpendicular.

*T. australicus*, sp. nov. Elongatus; subparallelus; pubescens; capite prothoraceque crebre subtilius punctulatis; hoc quam

longiori parum latiori, angulis posticis retrorsum productis acutis carinatis; elytris prothoraci latitudine æqualibus, apice breviter submucronatis, subtiliter striatis, striis sat subtiliter minus crebre punctulatis, interstitiis planis crebre subtiliter punctulatis; antennarum articulo ultimo ad apicem breviter subappendiculato. Long., 16—13 l.; lat., 4—4½ l.

N. Queensland; sent to me by Mr. French.

## TENEBRIONIDÆ.

### SPILOSCAPHA.

*S. thalloides*, Pasc. This species (described by Mr. Pascoe as a *Platydemia*) is certainly a *Spiloscapa*. Mr. Bates (E.M.M., IX., p. 203) has already expressed the opinion that the description of *P. thalloides* reads like that of *S. crassicornis*. Examples before me are certainly *P. thalloides*, equally certainly a *Spiloscapa*, and scarcely less certainly *S. crassicornis*, Bates,—which name consequently should be regarded as a synonym of Mr. Pascoe's name.

### BRENTHIDÆ.

#### HORMOCERUS.

*H. fossulatus*, sp. nov. Griseo-brunneus, prothoracis sulco intus plus minusve flavescenti; opacus; rostro quam prothorax vix breviori, postice longitudinaliter sulcato; antennis quam rostrum multo brevioribus, robustis, articulis (basali apicali-que exceptis) transversis; prothorace longitudinaliter profunde sulcato, ad latera grosse vix crebre punctulatis, antice angustato; elytris sulcatis, sulcis grosse punctulatis, interstitiis costulatis.

Maris rostro recto ad apicem dilatato; prothorace quam latiori duplo longiori; elytris ad apicem late explanatis; abdominis segmentis basalibus 2 late profunde concavis.

Feminae rostro manifeste arcuato; prothorace quam latiori sesquolongiori; elytris ad apicem vix explanatis; abdominis segmentis basalibus 2 grosse vermiculatis, haud concavis. Long. (rostr. excepto), 8—10 l.; lat.,  $1\frac{3}{5}$ — $1\frac{9}{10}$  l.

The genus *Hormocerus* has not, I believe, been previously recorded as Australian. The above species is clothed with a kind of dust-like squamosity which however is wanting on the front half of the rostrum and is very sparse on the disc of the prothorax. The antennæ are inserted (in the male scarcely, in the female distinctly) behind the middle of the rostrum.

N. Queensland; Cairns; sent to me by Mr. Froggatt and Mr. Masters.

MESETIA (gen. nov. *Brenthidarum*).

Mas. Caput fere ut *Ithysteni* sed paullo minus elongatum; rostrum leviter compressum quam prothorax paullo longius, supra longitudinaliter sulcatum ad apicem minus dilatatum; antennæ fere ut *Ithysteni* sed paullo breviores; prothorax et elytra fere ut *Ithysteni* sed his (speciei typicæ) sat fortiter striatis; femora postica vix ultra abdominis segmentum 2<sup>um</sup> extensa; tarsorum posticorum articulus 1<sup>us</sup> quam sequentes 2 conjuncti haud longior; abdominis segmenta basalia 2 longitudinaliter concava.

Femina latet.

In M. Lacordaire's arrangement of the *Brenthidae* this genus is referable without hesitation to the division consisting of the two groups *Belorhynchides* and *Ithystenides* (which are distinguished *inter se* by the tarsi either "robust, with the basal joint not longer than the next two together" or "slender, with the basal joint longer") but it seems to be intermediate between those groups, having slender tarsi the basal joint of which does not exceed the next two in length. I cannot find that it has been hitherto characterised.

*M. amæna*, sp. nov. Rufo-testacea; capite antennis prothoracis vittis 3 pedibus elytrorum parte suturali et corporis subtus partibus lateralibus nigro-piceis, elytrorum vittis discoidalibus 3 angustis flavo-testaceis; capite prothoraceque fere levibus; elytris leviter striatis, striis crebre minus fortiter punctulatis. Long. (rostro excepto), 8 l.; lat.,  $1\frac{1}{10}$  l.

N.S. Wales; Tweed River District; sent by Mr. Froggatt.

## LONGICORNES.

## OPSIDOTA.

*O. æstuosa*, sp. nov. Mas. Rufa, pilis albis sat sparsim vestita, his in prothoracis basi maculis 3 et in scutello condensatis; sat grosse (elytrorum apicem versus vix rugulose) ruguloso-punctulata; antennis quam corpus vix longioribus, articulis (basalibus 2 exceptis) fortiter compressis, 3<sup>o</sup> quam 4<sup>us</sup> subbreviori, 11<sup>o</sup> appendiculato; prothorace quam longiori fere sesquialtiori, ante medium rotundato-dilatato, in disco longitudinaliter breviter elevato-glabro; elytrorum apice suturali spiniformi. Long., 15 l.; lat.,  $4\frac{2}{3}$  l.

Feminae antennis quam corpus multo brevioribus, oculis quam maris inter se minus approximatis. Long., 18 l.; lat., 5 l.

Sculptured almost exactly as *Anatisis laminosus*, Newm., but a little more coarsely on the basal part of the elytra. Also bears considerable resemblance to *A. Frenchi*, Blackb., but at once distinguishable by its male having non-flabellate antennæ.

N. Queensland; sent to me by Mr. French.

ACROGENIUS (gen. nov. *Cerambycidarum*).

Caput antice productum; oculi emarginati, vix subtiliter granulati; antennæ (feminæ?) quam corpus sat breviores (articulis haud spinosis, 1° modico, 2° brevi, 3° quam 1<sup>us</sup> et quam 4<sup>us</sup> duplo longiori, 5° quam 4<sup>us</sup> vix breviori); prothorax subcylindricus inermis; elytra ad apicem truncata haud spinosa; coxæ intermediæ extus clausæ; femora petiolata, elongata, ad apicem subito valde clavata (posticis elytra paullo superantibus); tarsorum posticorum articulus 1<sup>us</sup> quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti vix longior.

Its finely granulate eyes (about as finely as in *Ectosticta*, in which however the granulation is less fine than in many genera of the section) refer this genus to the second of M. Lacordaire's sections of the *Cerambycides*. In that section the combination of "intermediate coxæ closed externally," "front coxæ rather widely separated from each other," "head not narrowed behind," "elytra punctulate," "elytral epipleuræ obsolete," "eyes rather distant from each other" places this genus among six "groupes" which M. Lacordaire says cannot be distinguished *inter se* by any sharply defined character. Of these groups it appears to me that the *Tillomorphides* is the one in which the present genus is most at home. Its antennæ are not long enough for the *Rhopalophorides*, and other objections occur in respect of the remaining four. The most striking character seems to lie in its femora, all of which are petiolate and clavate in the most exaggerated degree, the petiole of the front femora being a little longer than (of the intermediate nearly twice as long as, and of the hind more than twice as long as) the clavate black apex. Thus the femora are not unlike those of *Ectosticta* except in being (especially the hind pair which are half again as long as the intermediate) much longer. The head, prothorax and antennæ are very much like those of *Acrocyrta chrysoderes*, Pasc., except in the yellow of the prothorax being of the derm (not caused by pubescence) and in the antennæ not being spinose.

*A. tinctus*, sp. nov. Sat elongatus; setis subtilibus erectis sat sparsim vestitus; capite meso- et meta- sternis pedibus (femorum petiolo excepto) prothoracis macula parva et elytris (notulis nonnullis exceptis) nigris, partibus ceteris rufo-testaceis, elytrorum notulis flavis exceptis [sc. in utroque elytro sutura et margine laterali usque ultra medium, plaga subscutellari elevata eburnea, notula lineari discoidali eburnea litteram 4 (sursum deorsum versatam) simulanti, inter hanc et marginem lateralem linea eburnea oblique posita, et fascia eburnea paullo ante apicem posita], antennis ad basin fere nigris ultra medium fuscescentibus;

capite fortiter (antice sat crebre postice sat sparsim) punctulato; prothorace subvelutino subopaco haud perspicue sculpturato, longitudine latitudini æquali, subcylindrico (sed lateribus leviter arcuatis); elytris crebre grosse rugulose (prope apicem minus crebre minus grosse) punctulatis. Long.,  $4\frac{1}{5}$  l.; lat.,  $1\frac{1}{5}$  l.

The elytral markings are not much like those of any other species known to me; the elevated ivory-like lines are of a pale yellow color and are placed on patches of brighter yellow than themselves and of similar shape. If the yellow color be taken as the ground, the blackish markings are (*a*) a large basal patch not quite touching the lateral margins and interrupted at the suture (*b*) a mark resembling the letter L (reversed on the left elytron); regarding the yellow color as the markings the head of the insect must be towards the observer to produce the effect of a yellow L, which is then seen on what appears to be the left elytron, that on the right elytron being then reversed (*c*) a patch covering the whole of about the apical quarter of the elytra.

N. Queensland; in the collection of Mr. French.

#### PHYTOPHAGA.

(Tribe) EUPODA.

#### CHEILOXENA.

*C. insignis*, sp. nov. Subelongata; minus opaca; fusca, antennis pedibusque rufescentibus, elytrorum tuberculis nigris; pilis brevibus albidis sat sparsim (his hic illic in elytris maculatim condensatis) vestita; prothorace sat transverso vix crebre punctulato, lateribus dentatis; elytris sat crebre vix seriatim tuberculatis; antennarum articulis  $8^{\circ}$ — $10^{\circ}$  brevibus submoniliformibus. Long.,  $4$ — $4\frac{1}{2}$  l.; lat.,  $1\frac{4}{5}$ — $2$  l.

Readily distinguishable from *C. Westwoodi*, Baly, *inter alia* by the short submoniliform joints 8—10 of its antennæ and the whitish hair-like scales of its surface which are condensed on the elytra to form rather conspicuous spots some of them considerably larger than any of the yellowish spots on the elytra of *Westwoodi*; also by the much more numerous and confusedly arranged tubercles of its elytra. Differs also from *C. Frenchæ*, Blackb., by the presence of lateral prothoracic teeth.

Victoria and N.S. Wales; on Eucalyptus.

(Tribe) GALERUCIDES.

In M. Lacordaire's classification this "tribe" forms the last section of the family *Phytophaga*. It is very numerously represented in Australia but up to the present time comparatively few of its Australian species have been described and named, and

those which have been named have not been treated of systematically or collectively. The following is an attempt at a systematic treatment of the tribe. I have no doubt that errors will be found in my work, and I do not think it possible to issue such a work as I am attempting without running the risk of error, as many of the existing descriptions are of such a nature that the identification of the species they refer to is most difficult, and even the apportionment of the species to *genera* is in some cases almost a matter of guess-work. M. Lacordaire divides the tribe into the "sub-tribes" *Halticides* and *Galerucides* according as the hind femora are or are not dilated giving the insects saltatorial faculties.

(Sub-Tribe) HALTICIDES.

Of this sub-tribe 78 species have been described and they are distributed among 19 genera. Two of these—*Haltica splendida*, Oliv., and *H. smaragdula*, Oliv.—are not intelligibly characterised and it is not possible to refer them to any *genus* with confidence. In Mr. Masters' Catalogue the former stands as a true *Haltica* (possibly correctly), the latter as an *Arsipoda*, but the description of the latter characterises the basal joint of its hind tarsi as "*valde elongatus*" which is inconsistent with a place in *Arsipoda*; I can offer no suggestion as to what it really is. It is quite possible that some of my generic determinations may not stand—*e.g.*, I think it probable that *Arsipoda* will be sub-divided eventually and I doubt the Australian *Crepidodera* remaining in permanent association with the European species of that genus. Under these circumstances it seems necessary to preface my work with a tabulated statement of generic characters which will enable the student to determine without hesitation to what genus I refer the insects treated of in this memoir. I regret that I am unable to place the genus *Platycephala* in the tabulation; unfortunately however its author has not stated whether its antennæ are approximate at the base; if they are not approximate (but in that case surely the author, Dr. Baly, could not have overlooked the character) *Platycephala* must be extremely close to *Amphimela*; if they are approximate the genus seems to be near *Arsipoda* structurally (judged by Dr. Baly's diagnosis) but to differ *inter alia* by its hind tibiæ being strongly dentate. In the following pages I characterise three new genera and 56 new species of *Halticides*, besides recording as Australian four genera not previously attributed to Australia.

A. Front coxal cavities closed.

B. Apical joint of hind tarsi not abnormally dilated.

C. Claws bifid ... .. Podontia.

CC. Claws appendiculate.

D. Antennæ very widely separated at the base ... Amphimela.

DD. Antennæ not abnormally separated at the base.

- E. Mesosternum distinct.
- F. Hind tibiæ distinctly sulcate.
- G. Prothorax with an anterior sulcus on either side ... .. Nisotra.
- \*GG. Prothorax without anterior sulci.
- H. Intermediate tibiæ not dentate externally.
- I. Basal joint of hind tarsi longer than the two following together ... Xenidia
- II. Basal joint of hind tarsi shorter than the two following together... Arsipoda
- HH. Intermediate tibiæ dentate externally ... .. Plectroscelis.
- FF. Hind tibiæ not or scarcely furrowed ... Crepidodera.
- EE. Mesosternum concealed... .. Sphærophyma.
- BB. Apical joint of hind tarsi strongly swollen ... Opisthopygme.
- AA. Front coxal cavities open behind.
- B. Claws simple ... .. Docema.
- BB. Claws appendiculate.
- C. Hind tibiæ unarmed ... .. Licyllus.
- CC. Hind tibiæ mucronate.
- D. Apical joint of hind tarsi not abnormally dilated.
- E. Mucro of hind tibiæ normal.
- F. Antennæ 11-jointed.
- G. Mesosternum distinct.
- H. Prothorax devoid of sulci.
- I. Basal joint of hind tarsi not excessively elongated.
- J. Hind tibiæ rounded or truncate at apex.
- K. Species of large size (more than 2 l.) ... .. Sutrea.
- KK. Very small species (about 1 l.) Phyllotreta.
- JJ. Apex of hind tibiæ divided into two short lobes ... .. Aphthona.
- II. Basal joint of hind tarsi half as long as its tibia ... .. Longitarsus.
- HH. Prothorax with a transverse sulcus only.
- I. Prothoracic sulcus bent hindward on either side to reach the base.
- J. Mucro of front tibiæ normal ... Hyphaltica.
- JJ. Mucro of front tibiæ very small placed above the tarsus ... Halticodes.
- II. Prothoracic sulcus entirely transverse ... .. Haltica.
- HHH. Prothorax with both transverse and longitudinal sulci.
- I. All the tibia mucronate ... .. Xuthea.
- II. Only the hind tibiæ mucronate ... Lactica.
- GG. Mesosternum concealed ... .. Sphæroderma.
- FF. Antennæ with only 10 joints ... .. Psylliodes.
- FFF. Antennæ with only 9 joints ... .. Enneamera.
- EE. Mucro of hind tibiæ bifid ... .. Dibolia.
- DD. Apical joint of hind tarsi strongly swollen ... .. Edionychis.

\* I have attributed (with hesitation) to *Arsipoda* one species in which the basal sulci are interruptedly elongated nearly to the front margin.

## AMPHIMELA.

*A. australis*, Blackb. I have received from Mr. Masters an example taken near Sydney which I hesitate to separate from this species although it differs markedly in coloring, its prothorax being entirely of a clear yellow color and its antennæ entirely pitchy-black. It is also of somewhat different form being a wider insect with its greatest width slightly behind the middle of the elytra; this difference of form may be sexual. Even as a variety it seems distinct enough to bear a name so I propose to call it "var. ? *piceicornis*."

## XENIDIA.

The following species seem to be referable to this genus which has not previously been reported as Australian. Unfortunately it is not possible to be quite certain in identifying *Xenidia* without an authentic type as its author (Dr. Baly) does not say whether its front coxæ are closed behind. The following are the leading characters of the species described below: front coxæ closed behind; anterior four tibiæ unarmed (Dr. Baly gives no information regarding the front tibiæ); transverse sulcus of prothorax feeble or wanting; claws appendiculate; hind tibiæ very much as in *Plectroscelis* but with an even wider sulcus, and not furnished with a tooth externally; basal joint of hind tarsi longer than the following two together.

*X. picticornis*, sp. nov. Late ovalis; nitida; fortiter convexa; subtus picea; supra cupreo-purpurea, antennarum articulis 3° 4° 11° que plus minusve testaceis, pedibus plus minusve piceis vel rufo-piceis (femoribus posticis supra fere nigris purpureo-tinctis); capite lævi; oculis magnis; antennis quam corpus paullo brevioribus, sat gracilibus, apicem versus paullo incrassatis [articulo 1° modico, 2° quam 1<sup>i</sup> dimidium longiori, 3° quam 1<sup>us</sup> sublongiori, 4° quam 3<sup>us</sup> maris haud (feminae paullo) breviori, 5° 3° longitudine æquali]; prothorace fortiter transverso, transversim leviter sulcato (sulco fortiter punctulato) et utrinque impresso, minus perspicue (sulco transverso excepto) punctulato, antice leviter angustato, lateribus sat fortiter marginatis leviter arcuatis paullo pone marginem anticum angulatis; elytris leviter (marginem versus fortius) striatis, striis fortiter punctulatis, interstitiis planis (marginem versus convexis) subtiliter punctulatis; tibiis posticis dilatatis fortiter sulcatis, sulci margine externo fortiter crenulato; tarsorum posticorum articulo basali ceteris conjunctis æquali. Long., 1 $\frac{1}{2}$  l.; lat.,  $\frac{4}{5}$  l.

The coloring of this species,—especially the pallid (in some examples almost white) apical joint of its antennæ,—distinguishes it from its previously described congeners.

N. Queensland; taken by Mr. Koebele near Cairns.



*X. bizonata*, sp. nov. Sat late ovalis; sat nitida; sat fortiter convexa; obscure cyanea, antennarum parte intermedia elytrorum parte dimidia anteriori mesosterno metasternoque rufo-fulvis; capite fere ut præcedentis sed antennis paullo brevioribus, articulo 3° (?feminae solum) quam 4<sup>us</sup> manifeste longiori; prothorace fere ut præcedentis sed sparsim sat fortiter punctulato; elytris (colore excepto) fere ut præcedentis sed paullo magis elongatis; pedibus fere ut præcedentis sed tibiaram posticarum sulci margine externo minus distincte crenulato. Long.,  $1\frac{1}{2}$  l.; lat.,  $\frac{4}{5}$  l.

An easily recognisable species on account of its color and markings.

N. Queensland; taken by Mr. Koebele near Cairns.

*X. melancholica*, sp. nov. Late ovalis; nitida; fortiter convexa; nigra vix cyanescens, antennarum articulis 2—6 plus minusve testaceis, capite fere ut *X. picticornis* sed antennis manifeste brevioribus, articulo 3° (?feminae solum) quam 4<sup>us</sup> manifeste longiori; prothorace utrinque ad basin vix impresso, transversim haud sulcato, cetera ut *X. picticornis*; elytris subtiliter seriatim punctulatis, nullo modo striatis, interstitiis subtilissime punctulatis; pedibus ut *X. picticornis*. Long.,  $1\frac{1}{5}$  l.; lat.,  $\frac{7}{10}$  l. (vix).

N. Queensland; taken by Mr. Koebele near Cairns.

#### ARSIPODA.

There is great diversity of facies among the species that, according to Dr. Baly, ought to be attributed to this genus; but amid this diversity there seems to be great structural uniformity. I refer below (under *A. aeneofulva*) to the sexual characters. The males, it may also be noted, have (I think in all the species) a fovea near the apex of the fifth ventral segment from which a furrow (varying from a deep sulcus to a fine line) runs hindward towards the base of the segment. In some few species the males have the hind femora strongly toothed. The following tabulated statement of characters includes those of the previously named species with the exception of *A. bifrons*, Er., which I am unable to place. I should have felt some hesitation in identifying *A. chrysis*, Oliv., had I not possessed an example ticketed as that species from the collection of Dr. Chapuis who probably had good reason for his identification.

A. Elytra dark or metallic.

B. Seriate puncturation of elytra well defined—  
at any rate near the base.

C. Prothorax with a transverse impression.

D. Elytra dark, prothorax (at any rate partly) red.

E. Anterior femora testaceous or red.

- F. Head not impressed with deep foveæ.  
 G. Punctures in elytral series closely placed ... .. *leviceps*, Blackb.  
 GG. Punctures in elytral series much less closely placed ... .. *languida*, Blackb.  
 FF. Head impressed with deep foveæ... *Erichsoni*, Baly.  
 EE. Anterior femora black ... .. *bicolor*, Waterh.  
 DD. Elytra and prothorax uniformly dark or (if scarcely so) with metallic gloss.  
 E. Abdomen wholly dark, or at most apical segment partly reddish.  
 F. Size moderate or large.  
 G. Form more or less *elongate*-oval.  
 H. Antennæ (at most basal part excepted) piceous or black.  
 I. Hind angles of prothorax not acutely dentiform.  
 J. Elytra with a well-defined sub-basal transverse impression.  
 K. Elytral interstices somewhat strongly punctulate ... .. *chrysis*, Oliv.  
 KK. Elytral interstices scarcely visibly punctulate ... .. *jocosa*, Blackb.  
 JJ. Elytra evenly convex or nearly so ... .. *concolor*, Blackb.  
 II. Hind angles of prothorax acutely dentiform ... .. *cæruleata*, Baly.  
 HH. Antennæ entirely pallid ... .. *æneo-fulva*, Blackb.  
 GG. Form very short and broad ... .. *Lownei*, Baly.  
 FF. Size very small (long. 1 l.).  
 G. All the femora dark ... .. *consanguinea*, Blackb.  
 GG. The anterior femora fulvous ... .. *parvula*, Jac.  
 EE. Apical two or three segments of abdomen red in both sexes ... .. *Macleayi*, Baly.  
 CC. Prothorax devoid of transverse impression.  
 D. Elytra dark, prothorax red.  
 E. Abdomen black ... .. *fulvicollis*, Baly.  
 EE. Abdomen entirely rufous ... .. *spectabilis*, Blackb.  
 DD. Elytra and prothorax uniformly of dark color.  
 E. Form more or less *elongate*-oval.  
 F. Seriate punctures of elytra well defined at least in front half.  
 G. Femora at least as dark as the tibiæ.  
 H. Prothorax at most *moderately* narrowed anteriorly.  
 I. Apical portion of antennæ very strongly incrassate.  
 J. Abdomen unicolorous ... .. *picipes*, Baly.  
 JJ. Apical portion of abdomen rufo-testaceous ... .. *crassicornis*, Waterh.  
 II. Apical portion of antennæ but little incrassate ... .. *consuta*, Germ.

- HH. Prothorax twice as wide at base as at apex ... .. *striatipennis*, Blackb.
- GG. Femora rufous, tibiae blackish... *femorata*, Baly.
- FF. Seriate punctures of elytra obsolete except close to the base ... *detersa*, Blackb.
- EE. Form short and broad.
- F. Elytra distinctly striate, legs fulvous *fulvipes*, Baly.
- FF. Elytra not striate.
- G. Legs fulvous ... .. *deceptrix*, Blackb.
- GG. Femora black ... .. *pallidicornis*, Blackb.
- BB. Elytra without seriate puncturation (at least in front part of disc).
- C. Prothorax without a transverse sulcus.
- D. Prothorax and elytra concolorous or nearly so.
- E. Form *elongate*-oval (general color black)
- F. Elytra entirely black ... .. *holomelana*, Germ.
- FF. Elytra reddish in apical half ... *terminalis*, Blackb.
- EE. Form short and broad (color green)... *nitida*, Waterh.
- D. Elytra dark, prothorax red.
- E. Elytra rugulose ... .. *rugulosa*, Baly.
- EE. Elytra not rugulose ... .. *haematodera*, Baly.
- CC. Prothorax with a transverse sulcus ... *paradoxa*, Blackb.
- AA. Elytra non-metallic, more or less testaceous.
- B. Size large ( $2\frac{1}{2}$  l. or more) ... .. *podontioides*, Blackb.
- BB. Size moderate or small (less than 2 l.).
- C. Form *elongate*-oval.
- D. Elytra with strongly defined seriate puncturation.
- E. Punctures in the elytral rows closely placed ... .. *evnescens*, Blackb.
- EE. Punctures in the elytral rows very distantly placed ... .. *fossipennis*, Blackb.
- DD. Elytra with scarcely traceable seriate puncturation.
- E. Antennae (except at base) dark piceous.
- F. Prothorax closely punctulate ... *jugularis*, Blackb.
- FF. Prothorax sparsely punctulate ... *hepatica*, Blackb.
- EE. Antennae testaceous ... .. *acuminata*, Waterh.
- CC. Form broadly oval or subquadrate.
- D. Seriate puncturation of elytra well defined.
- E. Prothorax narrowed in front.
- F. Elytral sculpture continuous almost to the apex.
- G. Lateral margins of prothorax narrowed towards base.
- H. Longitudinal furrow on each side of prothorax normal ... *variegata*, Waterh.
- HH. Longitudinal furrow on each side of prothorax excessively wide ... .. *collaris*, Blackb.
- GG. Lateral margins of prothorax not narrowed towards base ... *picturata*, Blackb.
- FF. Elytral sculpture obsolete in apical one-third ... .. *variabilis*, Blackb.
- EE. Prothorax fully as wide across front as across base ... .. *laticollis*, Blackb.
- DD. Seriate puncturation of elytra obsolete *ovata*, Waterh.

*A. laeviceps*, sp. nov. Mas. Ovalis; nitida; nigra, capite prothorace antennarum basi abdominis apice pedibusque rufis; capite lævi, inter oculos sulcato; antennis quam corporis dimidium paullo longioribus, sat robustis, articulo 1° incrassato minus elongato, 2° brevi, 3° quam 1<sup>us</sup> vix breviori, 4° 3° sat æquali; prothorace quam longiori duplo latiori, subcrebre minus fortiter punctulato, transversim et utrinque longitudinaliter profunde sulcato, lateribus vix arcuatis, angulis anticis incrassatis oblique truncatis; elytris leviter striatis (striis discoidalibus antice obsoletis), striis sat grosse sat crebre punctulatis, interstitiis punctulatis (postice et latera versus leviter convexis; femoribus posticis inermibus.

Feminae pedibus posticis nigris, abdomine concolori. Long.,  $1\frac{4}{5}$ —2 l.; lat.,  $\frac{9}{10}$  l.

Near *A. Erichsoni*, Baly, but differing *inter alia* in its red head, which is devoid of foveæ above the eyes.

Victoria and N.S. Wales; in mountainous places.

*A. languida*, sp. nov. Mas. Elongato-ovalis; nitida; subtus nigra, abdomine postice capiteque rufis; supra (antennis pedibusque inclusis, illis apicem versus piceo-tinctis) rufa, capite postice infuscato, elytris æneo-viridibus, nonnihil auratis; capite minus distincte punctulato, inter oculos sulcato; antennis quam corporis dimidium vix longioribus; minus robustis, articulis fere ut *A. lævicipitis* sed 1° paullo longiori minus incrassato; prothorace quam longiori minus quam duplo latiori, crebre subtilius punctulato, transversim et utrinque longitudinaliter minus fortiter sulcato, antice angustato, lateribus vix arcuatis, angulis anticis incrassatis oblique late truncatis; elytris vix striatis, seriatim minus fortiter minus crebre punctulatis, interstitiis planis punctulatis.

Feminae antennis paullo brevioribus, pedibus posticis infuscatis, prothorace medio infuscato. Long.,  $1\frac{1}{2}$  l.; lat.,  $\frac{7}{10}$  l.

Nearest to *A. bicolor*, Waterh. (probably) which is very insufficiently described, but as the femora of that species are said to be black I presume that this insect is not identical with it.

Victoria.

*A. concolor*, sp. nov. Mas. Ovalis, subelongata; nitida; obscure viridis, antennarum basi pedibusque vix picescentibus; capite inter oculos manifeste punctulato et transversim sulcato; antennis robustis quam corporis dimidium paullo longioribus, articulo 1° modico sat incrassato, 2° sat brevi, 3° quam 1<sup>us</sup> subbreviori quam 4<sup>us</sup> vix longiori; prothorace quam longiori duplo latiori sat quadrato, minus convexo, antice parum angustato, sat crebre sat distincte punctulato, transversim

(leviter) et utrinque longitudinaliter (sat profunde) sulcato, lateribus fere rectis, angulis anticis subtuberculiformibus; elytris æqualibus, vix striatis, seriatim concinne nec fortiter punctulatis, interstitiis planis minus subtiliter punctulatis.

Femina latet. Long.,  $2\frac{1}{5}$  l.; lat., 1 l.

A very distinct species, nearest perhaps to *chrysis*, Oliv., but differing *inter alia* in color, in its less convex and more quadrate prothorax and its evenly convex elytra.

Victoria.

*A. jocosa*, sp. nov. Mas. Ovalis, fere subparallela; nitida; nigra, capite prothoraceque læte viridibus, elytris cupreo-violaceis, antennarum articulis basalibus 4 (basali supra excepto) et tibiærum basi summa rufis; capite obsolete vix subtiliter punctulato, inter oculos minus distincte sulcato, a sulco antrorsum usque ad clypei apicem (longitudinaliter) præter modum anguste carinato; antennis ut *A. concoloris*; prothorace fere ut *A. concoloris* sed paullo magis obsolete punctulato, antice magis angustato; elytris paullo pone basin late leviter sat distincte transversim impressis, vix striatis, seriatim sat subtiliter nec crebre punctulatis, puncturis in parte antica discoidali multo magis sparsim dispositis, interstitiis planis pernitidis fere lævibus vel potius subtilissime punctulatis.

Femina latet. Long.,  $2\frac{2}{5}$  l.; lat.,  $1\frac{1}{5}$  l.

An extremely nitid and brilliantly colored species, remarkable for the narrowness and strong elevation of the convexity running forward between the antennæ from the transverse sulcus on the head.

Australia; I am not quite sure of the exact habitat, but it is almost certainly in Victoria.

*A. æneofulva*, sp. nov. Elongato-ovalis; nitida; obscure fulva, æneo-micans, antennis pedibusque sordide testaceis; capite crebre subtilius punctulato, inter oculos sulcato; antennis quam corporis dimidium paullo brevioribus apicem versus paullo incrassatis, articulo 1° modico, 2° minus brevi, 3° quam 1<sup>us</sup> sat breviori quam 4<sup>us</sup> paullo longiori; prothorace quam longiori duplo latiori, sat æqualiter cum capite punctulato, antice vix angustato, lateribus parum arcuatis, angulis anticis fortiter incrassatis oblique truncatis; elytris vix striatis, seriatim concinne sat subtiliter punctulatis, interstitiis planis subtiliter punctulatis. Long.,  $1\frac{4}{5}$  l.; lat.,  $\frac{4}{5}$  l.

The color seems to be distinctive, —piceous (a little more pallid towards the apex) with a strongly marked bronzy gloss. This species somewhat resembles the preceding in sculpture but has the transverse sulcus of its prothorax much feebler. It is also a

considerably more elongate insect with shorter antennæ, different color, &c. The female does not differ from the male except in its slightly shorter antennæ, less dilated basal joint of tarsi, and differently formed apical segment of abdomen.

S. Australia; Eyre's Peninsula.

*A. consanguinea*, sp. nov. Sat elongata, postice sat angustata; nitida; supra viridis vel cyanea; subtus picea, antennis testaceis apicem versus vix vel manifeste infuscatis, femoribus rufo-piceis, tibiis tarsisque dilutioribus; antennis quam corporis dimidium sat brevioribus, articulis basalibus 2 incrassatis (hoc quam 3<sup>us</sup> haud longiori); capite cum prothorace subfortiter vix crebre punctulato, illo haud transversim carinato; prothorace sat transverso, antice angustato, ad basin utrinque longitudinaliter breviter sulcato, sulcis longitudinalibus sulco transverso conjunctis; elytris punctulato-striatis, puncturis in striis sat magnis, interstitiis apicem lateraque versus costiformibus. Long., 1 l.; lat.,  $\frac{1}{2}$  l. (vix).

This species must be very near *A. parvula*, Jac., but differs from the description of that species in many respects; the legs are differently colored; there is no trace of any transverse ridge on its forehead; the interstices of the elytral striæ are not "costate throughout" but distinctly so only near the lateral margins and the apex. I have seen numerous examples of this insect, which do not vary *inter se* except in the upper surface of some of them being cyaneous rather than green and the antennæ being more or less infuscate near the apex.

N. Queensland; taken by Mr. Koebele and Mr. Cowley.

*A. spectabilis*, sp. nov. Fem. Ovalis, minus elongata; nitida; rufa, elytris obscure violaceis, antennis apicem versus et femorum posticorum apice piceo-nigris; capite minus distincte (inter oculos subfortiter sparsim) punctulato, inter oculos sulcato, juxta oculorum (his subapproximatis) partem postico-internam utrinque profunde excavato; antennis vix robustis quam corporis dimidium brevioribus, articulo 1<sup>o</sup> incrassato minus elongato, 2<sup>o</sup> minus brevi, 3<sup>o</sup> quam 1<sup>us</sup> vix breviori quam 4<sup>us</sup> sat longiori; prothorace quam longiori plus quam duplo latiori, subtilius minus crebre punctulato, antice sat angustato utrinque longitudinaliter sulcato, lateribus vix arcuatis, angulis anticis fortiter incrassatis oblique truncatis; elytris vix striatis, striis subtilius sat crebre punctulatis, interstitiis planis sparsim subtiliter punctulatis. Long.,  $2\frac{1}{2}$  l.; lat.,  $1\frac{1}{4}$  l.

Mas. latet.

A notable species on account of the very wide and deep sulci

on the head at the postero-internal corner of the eyes (which in most *Arsipodæ* are much slighter impressions) and the comparatively narrow interval between the eyes.

Queensland; sent to me by Mr. Masters.

*A. deterosa*, sp. nov. Mas. Ovalis; minus elongata; nitida; subtus cum antennis pedibusque nigra; supra obscure cyanescens vel violacea; capite inter oculos leviter sulcato, dupliciter (subtiliter et sat fortiter) nec crebre punctulato; antennis robustis quam corporis dimidium parum longioribus, apicem versus incrassatis; articulo 1° modico, 2° sat brevi, 3° quam 1<sup>us</sup> paullo breviori quam 4<sup>us</sup> vix longiori; prothorace quam longiori paullo plus quam duplo latiori, antice multo angustato, concinne subcrebre subtilius punctulato, utrinque longitudinaliter sulcato, lateribus leviter arcuatis, angulis anticis incrassatis antrorsum manifeste acutis; elytris vix striatis, seriatim punctulatis, seriebus mox pone basin obsoletis (externis fere ad medium continuis), interstitiis planis sat crebre minus subtiliter punctulatis. Long.,  $2\frac{1}{5}$ — $2\frac{4}{5}$  l.; lat.,  $1\frac{1}{10}$ — $1\frac{2}{5}$  l.

Femina differt ut *A. æneofulva*.

Var. ? colore æneo, statura minore.

Easily distinguishable by the sculpture of its elytra; well defined rows of punctures commence on the base but do not run further back than about one-fourth or one-third the length of the elytra where their punctures diminish to about the same size as those of the interstices. The var. ? is from N.S. Wales.

Victoria; Alpine region.

*A. striatipennis*, sp. nov. Fem. Ovalis vel fere obovata; fortiter convexa; minus nitida; fusco-picea, sat manifeste æneomicans, antennis pedibusque dilutioribus; capite subfortiter sat crebre punctulato, inter oculos fortiter sulcato; antennis modice robustis quam corporis dimidium manifeste brevioribus, articulo 1° sat elongato, 2° sat brevi, 3° quam 1<sup>us</sup> sat breviori quam 4<sup>us</sup> vix longiori; prothorace quam longiori plus quam duplo latiori, antice fortiter angustato sat crebre subfortiter punctulato, utrinque longitudinaliter sulcato, lateribus leviter arcuatis angulis anticis incrassatis oblique subtruncatis; elytris manifeste striatis, striis sat fortiter minus crebre punctulatis, interstitiis leviter convexis subtiliter punctulatis. Long.,  $2\frac{1}{5}$  l.; lat.,  $1\frac{1}{5}$  l.

Mas. latet.

A rather broad species, but much narrowed behind; it is notable by the seriate punctures of its elytra being placed in distinct striæ, the intervals between which are distinctly though only gently convex; the metallic gloss on the elytra is not

very marked so that it hovers a little doubtfully between the two groups (metallic and non-metallic species) into which I have divided the *Arsipodæ* in my tabulation.

S. Australia ; Murray R. district.

*A. deceptrix*, sp. nov. Mas. Breviter ovalis ; nitida ; nigra, antennarum articulis basalibus 5 vel 6 pedibus abdomineque fulvis ; capite sublævi, inter oculos sulcato, oculis inter se minus distantibus ; antennis quam corporis dimidium paullo longioribus, articulo 1° modico minus crasso, 2° minus brevi, 3° quam 1<sup>us</sup> vix breviori quam 4<sup>us</sup> paullo longiori ; prothorace quam longiori plus quam duplo latiori, sparsim minus subtiliter punctulato, antice leviter angustato, utrinque longitudinaliter sulcato, lateribus fere rectis, angulis anticis incrassatis oblique truncatis ; elytris haud striatis, seriatim subtiliter (in parte discoidali quam prothorax nullo modo magis fortiter) punctulatis, interstitiis planis sparsim subtiliter (quam series magis subtiliter) punctulatis. Long.,  $1\frac{7}{10}$  l. ; lat., 1 l. (vix).

Femina differt ut *A. æneofulvæ*.

This species must be very close to *A. fulvipes*, Baly (from N. Queensland), but can hardly be identical with it on account of its smaller size, and especially its non-striate elytra. (Dr. Baly says that the elytra of *A. fulvipes* are "distinctly punctate-striate.") The humeral calli being prominent cause the appearance of a furrow immediately within them, and these pseudo-furrows being opposite the longitudinal sulci of the prothorax it appears from a certain point of view as though the latter were continued on the elytra. A good idea of the sculpture of the elytra may be given by comparing it to that of the European *Apteropeda graminis*, Hoffm., which is similar in kind. In the present species, however, the seriate punctures are much coarser close to the base than on the rest of the surface, the largest punctures being larger than any on *A. graminis*, and the generality of punctures being decidedly finer than the seriate punctures of that species ; the punctures of the interstices are a little finer than in *A. graminis*, so that (except close to the base) there is less difference between the seriate and interstitial punctures, from which it results that (except close to the base) the rows of punctures are considerably less conspicuous.

N.S. Wales ; taken by Mr. Froggatt near Maitland.

*A. pallidicornis*, sp. nov. Fem. Late ovalis ; nitida ; nigra, antennis totis tibiis anterioribus 4 et tarsis omnibus pallide testaceis, abdomine rufo ; capite ut *A. deceptricis* ; antennis gracilibus, quam corporis dimidium vix longioribus, articulis 1—4 ut *A. deceptricis* ; prothorace fere ut *A. deceptricis* sed



antice magis angustato angulis anticis antrorsum sat acutis, sulcis longitudinalibus obsoletis; elytris fere ut *A. deceptricis* sed serierum puncturis basin versus quam alias haud majoribus, interstitiorum puncturis (quam *A. deceptricis*) majoribus sicut series subobsoletæ apparent.

Mas latet. Long.,  $2\frac{2}{3}$  l.; lat.,  $1\frac{3}{5}$  l.

A fine large species resembling *A. Macleayi*, Baly, in form; easily recognisable by the pale (almost whitish) testaceous color of its antennæ tarsi and anterior 4 tibiæ. Structurally it is very close to the preceding except in the slenderness of its antennæ.

Tropical Queensland; taken by Mr. Koebele.

*A. terminalis*, sp. nov. Fem. Elongato-ovalis, postice acuminata; nitida; nigra, antennarum articulis  $2^{\circ}$ — $4^{\circ}$  pedibus (femorum posticorum apice nigro, tibiis paullo infuscatis) elytrorum dimidia parte apicali et abdominis apice rufo-testaceis; capite tenuiter ruguloso, inter oculos sulcato; antennis quam corporis dimidium brevioribus, sat robustis, articulis  $5^{\circ}$ — $10^{\circ}$  subserratis, articulo  $1^{\circ}$  sat brevi,  $2^{\circ}$ — $4^{\circ}$  inter se longitudine sat æqualibus quam  $1^{\text{us}}$  parum brevioribus; prothorace quam longiori vix duplo latiori, dupliciter (subtilissime crebre et magis fortiter minus crebre) punctulatis, antice sat angustato, utrinque longitudinaliter breviter impresso, lateribus leviter arcuatis, angulis anticis antrorsum acutis; elytris confuse minus distincte punctulatis, pernitidis; tibiis posticis ante apicem leviter flexuosis. Long.,  $2\frac{2}{3}$  l.; lat.,  $1\frac{1}{3}$  l.

Mas latet.

Very like *A. holomelena*, Germ., from which it differs (apart from coloring) in its narrower and more elongate build, and in the hind tibiæ of the female being distinctly flexuous before the apex.

N.W. Australia.

*A. paradoxa*, sp. nov. Mas. Breviter ovalis; sat nitida; nigra vix ænescens, antennis pedibusque (femoribus plus minusve infuscatis exceptis) rufis; capite postice sat lævi antice tenuiter ruguloso, inter oculos sulcato; antennis robustis, quam corporis dimidium longioribus, articulo  $1^{\circ}$  modico,  $2^{\circ}$  minus brevi,  $3^{\circ}$   $2^{\circ}$  longitudine sat æquali quam  $4^{\text{us}}$  sat longiori; prothorace quam longiori duplo latiori, leviter sparsius punctulato, profunde transversim et utrinque longitudinaliter sulcato, antice parum angustato, lateribus leviter arcuatis, angulis anticis incrassatis oblique truncatis; elytris confuse confertim subrugulose punctulatis; femoribus posticis subtus dente magno armatis; tibiis posticis fortiter arcuatis. Long.,  $1\frac{1}{5}$  l.; lat.,  $\frac{3}{5}$  l.

Feminae femoribus posticis muticis; tibiis posticis rectis.

This is a very abnormal species which ought perhaps to be separated from *Arsipoda*. It differs from all its allies in the fourth joint of its antennæ being shorter than the second.

S. Australia; Eyre's Peninsula.

- A. podontioides*, sp. nov. Fem. Ovalis; nitida; testacea, elytrorum interstitiis (maculatim fere ut *Podontia nigrovariæ*, Macl.) striis epipleuris que femorum posticorum apice et tarsis subtus infuscatis; capite vix distincte punctulato, inter oculos interrupte sulcato; antennis corporis dimidio longitudine sat æquali, articulo 1° sat elongata, 2° brevi, 3° quam 1<sup>us</sup> sat breviori quam 4<sup>us</sup> vix breviori; prothorace quam longiori plus quam duplo latiori, antice vix angustato, subtiliter (ad latera acervatim sat grosse) punctulato, transversim et utrinque longitudinaliter fortiter sulcato, sulcis longitudinalibus antrorsum fere ad marginem anticum indistincte interrupte continuis, lateribus sat arcuatis, angulis anticis antrorsum acutis; elytris striatis, striis confertim subfortiter punctulatis, interstitiis leviter convexis vix manifeste punctulatis. Long.,  $2\frac{1}{2}$  l.; lat.,  $1\frac{2}{3}$  l.

Mas latet.

An abnormal species in appearance owing to the infuscate markings of its elytra which are much like those of *Podontia nigrovaria*, Macl.; indeed the insect has much resemblance to a very small *Podontia* but its appendiculate claws at once separate it from that genus. Its prothoracic sculpture is different from any of the varied types I have seen in other species of *Arsipoda*, but I do not find any marked structural character absolutely requiring a new generic name.

Queensland; sent to me by Mr. Masters.

- A. ænescens*, sp. nov. Mas. Elongato-ovalis; nitida; testacea vix ænescens, capite prothoraceque rufescentibus; capite distincte sat crebre punctulato, inter oculos sulcato; antennis modicis apicem versus incrassatis, articulo 1° sat elongato, 2° brevi, 3° minus elongato quam 4<sup>us</sup> paullo breviori; prothorace quam longiori minus quam duplo latiori, concinne sat crebre punctulato, transversim et utrinque longitudinaliter sulcato, antice leviter angustato, lateribus vix arcuatis, angulis anticis extrorsum acutis; elytris haud striatis, seriatim sat crebre minus fortiter punctulatis, interstitiis planis crebre distincte punctulatis.

Fem. latet. Long.,  $1\frac{4}{5}$  l.; lat.,  $\frac{4}{5}$  l.

This species was sent to me by M. Sevrin from the Chapuis collection ticketed "*Arsipoda ænescens*, type." I cannot find that any description of it has been published; but, to provide against my being mistaken on this point, I have used the name *ænescens*,

although the aeneous tone of coloring is so slight that I cannot regard the name as very appropriate.

W. Australia ; Albany.

- A. fossipennis*, sp. nov. Fem. Elongato-ovalis ; nitida ; testacea ; capite sparsim sat distincte punctulato, inter oculos sulcato ; antennis quam corporis dimidium vix longioribus, articulo 1° minus elongato, 2° breviori, 3° quam 1<sup>us</sup> vix breviori 4° longitudine æquali ; prothorace quam longiori minus quam duplo latiori, sat crebre minus subtiliter punctulato, antice paullo angustato, utrinque longitudinaliter fortiter et transversim subobsolete sulcato, lateribus leviter arcuatis, angulis anticis incrassatis oblique truncatis extrorsum acutis ; elytris haud striatis, seriatim sparsim subgrosse punctulatis, interstitiis planis subtiliter minus crebre punctulatis. Long.,  $1\frac{2}{3}$  l. ; lat.,  $\frac{3}{5}$  l.

This little species is notable for its uniform testaceous color and the coarse distantly placed punctures of its elytral series. I have a male example too much broken for description, but it does not seem to differ from the female except by the sexual characters common to the genus.

W. Australia ; taken by Mr. Meyrick.

- A. jugularis*, sp. nov. Mas. Elongato-ovalis ; nitida ; testacea, capite postice subtus nigro, sternis et abdominis dimidio basali plus minusve infuscatis ; antennis apicem versus nigricantibus, pedibus et abdominis apice rufescentibus ; capite crebre subtiliter punctulato, inter oculos sulcato ; antennis quam corporis dimidium brevioribus, robustis, apicem versus manifeste incrassatis, articulo 1° modice elongato, 2° brevi, 3° 4° que inter se sat æqualibus quam 1<sup>us</sup> sat brevioribus ; prothorace quam longiori minus quam duplo latiori, crebre subtiliter punctulato, antice sat angustato, transversim et utrinque longitudinaliter leviter impresso, lateribus leviter arcuatis, angulis anticis vix incrassatis obtusis ; elytris haud (postice vix manifeste) striatis, seriatim subtiliter crebre punctulatis, interstitiis planis crebre quam series parum magis subtiliter punctulatis (sicut series indistinctæ apparent) ; femoribus posticis dente parvo acuto armatis ; tibiis posticis arcuatis.

Fem. latet. Long.,  $1\frac{1}{5}$  l. ; lat.,  $\frac{1}{5}$  l.

The black middle of the hind portion of the head on the underside, the elytral series of punctures rendered inconspicuous by the comparatively strong puncturation of the interstices and the dentate hind femora of the male are notable characters of this species.

W. Australia ; taken by Mr. Meyrick.

*A. hepatica*, sp. nov. Fem. Elongato-ovalis; nitida; livida, antennis apicem versus nigricantibus; capite fere lævi, inter oculos sulcato; antennis fere ut præcedentis sed articulo 2<sup>o</sup> quam 3<sup>us</sup> vix breviori; prothorace fere ut præcedentis sed antice minus angustato, sparsim minus subtiliter punctulato, lateribus minus arcuatis, angulis anticis magis incrassatis oblique subtruncatis; elytris haud striatis seriatim minus crebre minus subtiliter (suturam versus vix seriatim), interstitiis planis sparsim inæqualiter punctulatis (sicut series indistinctæ apparent).

Mas. latet. Long.,  $1\frac{2}{3}$  l.; lat.,  $\frac{7}{10}$  l. (vix).

The uniform nitid livid coloring of this species seems to be a marked character. The elytral puncturation is on the same plan as that of the preceding (*A. jugularis*), but the seriate punctures are less fine and much less closely placed, and the puncturation of the interstices is very uneven, being near the base and suture so strong as almost entirely to confuse the series and in other parts becoming finer so as to leave the series tolerably distinct.

S. Australia; Eyre's Peninsula.

*A. variegata*, Waterh. An example in my collection from Tasmania (the locality of the type) agrees so well with Mr. Waterhouse's brief description of this species that there seems hardly any room for doubt about the correctness of its identification. Its small size, short robust form and variegated non-metallic elytra give it a facies so entirely different from (say) *A. chrysis* that one would not expect to find those two associated generically. Their structural characters however are very similar, and if Dr. Baly's view of *Arsipoda* be accepted,—that it is a genus in which several characters that in many genera are stable are subject to variation,—there seems to be no reason for excluding this species from *Arsipoda*. The following four species are all extremely closely allied to the insect referred to above, and with it form a very distinct group in the genus. I have specimens from the mountainous districts of Victoria and N.S. Wales which seem to me to be *A. variegata*.

*A. collaris*, sp. nov. Mas. Brevissime ovalis; nitida; rufescens, elytris (marginibus lateralibus exceptis) dilutioribus, abdomine obscuro, antennis apicem summum versus pice-scentibus; capite coriaceo, inter oculos fovea sat magna impresso; antennis quam corporis dimidium vix longioribus, articulo 1<sup>o</sup> minus elongato, 2<sup>o</sup> brevi, 3<sup>o</sup> 4<sup>o</sup> que inter se sat æqualibus quam 1<sup>us</sup> vix brevioribus; prothorace quam longiori fere triplo latiori, antice distincte angustato, indistincte vix crebre punctulato, transversim et utrinque longitudinaliter profunde sulcato, sulcis longitudinalibus latissimis

fere transversis, lateribus subrectis, angulis anticis subincrassatis late oblique truncatis; elytris vix striatis, seriatim sat fortiter vix crebre punctulatis, interstitiis sat planis subtiliter punctulatis.

Femina differt ut *A. aeneofulva*. Long., 1 l.; lat.,  $\frac{3}{5}$  l.

A species of shorter wider form than any of its immediate allies known to me; it is notable also for the great width of the excavation on either side the base of the prothorax and representing the longitudinal sulcus, which however is not strictly speaking longitudinal being a trifle wider than long.

S. Australia; Eyre's Peninsula.

*A. picturata*, sp. nov. Mas. Breviter ovalis; sat nitida; rufescens, supra dilutior, capite prothorace elytrisque concinne fusco-vel piceo-notatis, antennis ultra medium infuscatis; capite confertim subtilissime ruguloso, inter oculos transversim vix sulcato, macula<sup>2</sup> elongata fusca ornato; antennis fere ut *A. collaris* sed articulo 1° magis elongato, 2° minus brevi; prothorace utrinque macula magna fusca discoidali ornato, quam longiori fere triplo latiori, antice leviter angustato, confertim subtilius subrugulose punctulato, transversim et utrinque longitudinaliter sulcato, sulcis longitudinalibus normalibus, lateribus minus arcuatis, æqualiter præter solitum late marginato, angulis anticis late subtruncatis; elytris maculis nonnullis piceis bene determinatis (sc. macula basali litteram C simulanti et macula post mediana transversa contorta) et maculis fuscis communibus nonnullis in sutura dispositis ornatis, fere ut *A. collaris* sculpturatis sed puncturis seriatim magis crebris interstitiis magis crebre magis distincte punctulatis. Long.,  $1\frac{2}{3}$  l.; lat.,  $\frac{4}{5}$  l.

. Readily recognisable by the sharply defined markings of its upper surface and the prothoracic lateral margins distinctly wider than is usual in the genus, and of even width throughout their length.

S. Australia; sent to me by Mr. Masters.

*A. variabilis*, sp. nov. Mas. Breviter ovalis; sat nitida; colore variabilis, subtus obscura, supra rufa plus minusve infuscata vel picescens, elytris vel rufis piceo-umbratis vel fere totis piceis vel nigris, pedibus antennisque rufis (his apicem versus et illorum femoribus plus minusve infuscatis); capite coriaceo inter oculos vix distincte sulcato; prothorace fere ut *A. collaris* sed minus subtiliter punctulato, sulcis longitudinalibus multo minus latis; elytris haud striatis, seriatim minus fortiter minus crebre punctulatis, interstitiis planis quam *A. collaris* multo minus subtiliter punctulatis, sculptura in parte postica tertia subobsoleta. Long.,  $1\frac{3}{10}$  l.; lat.,  $\frac{7}{10}$  l. Femina differt ut *A. aeneofulva*.

I have seen numerous examples of this species and scarcely two of them are quite similar to each other in color and markings of the elytra. The elytra of a light colored example are pale red with an ill defined dark common patch around the scutellum and another about the middle. In a series of examples these dark patches more or less increase in size and vary into black until in extreme specimens they coalesce and spread out to cover the whole elytra. The great enfeeblement of the sculpture on the apical third of the elytra is a conspicuous character.

Victoria; mountainous districts.

*A. laticollis*, sp. nov. Mas. Sat breviter ovalis; sat nitida; rufo-testacea, elytris (maculatim) et antennis (apicem summum versus plus minusve) infuscatis; capite coriaceo, inter oculos sulcato; antennis corporis dimidio longitudine vix æqualibus, articulis fere ut *A. collaris*; prothorace quam longiori plus quam duplo latiori, antice haud angustato, sat crebre sat fortiter punctulato, transversim et utrinque longitudinaliter profunde sulcato, sulcis longitudinalibus normalibus, lateribus vix arcuatis, angulis anticis subtruncatis paullo pone marginem anticum extrorsum distincte acutis; elytris ut *A. collaris* sculpturatis; tibiis posticis extus ante apicem late distincte angulatis. Long., 1—1½ l.; lat.,  $\frac{3}{5}$ — $\frac{4}{5}$  l.

Feminae tibiis posticis haud angulatis.

Near *A. collaris* but differing *inter alia* in color and markings, in the prothorax not narrowed in front and with longitudinal sulci less wide and in the evident external angulation of the male hind tibiae. The infuscate blotches on the elytra are ill-defined and variable; they usually consist of an elongate discoidal blotch near the base and a larger one somewhat behind the middle.

S. Australia; near Quorn.

#### PLECTROSCELIS.

The task of dealing with the Australian species of this genus presents extreme difficulty owing to the fact that a number of species (12) have been described by Dr. Baly in such fashion that it is impossible to identify them with any confidence from the descriptions; for though the descriptions are fairly detailed, scarcely any are more than bare descriptions, and the absence of comparison with other species causes the utmost difficulty in forming any clear idea of the insects they relate to. I have associated many of Dr. Baly's names with insects in my collection, but with so much doubt that I cannot venture on making confident use of my identifications for the purposes of this memoir. Hence I am obliged also to pass unnoticed some species in my

collection which are probably undescribed but may be among Dr. Baly's, and to limit myself to describing new species that seem *very decidedly* different from those already characterised. As Dr. Baly's species are scattered through 3 separate memoirs without any connected classification it will be convenient for me to include in this memoir some brief notes on their probable relation to the species I describe below. I annex a tabular statement of the characters of the new species I now describe, and have been able to work into that statement by studying Dr. Baly's descriptions the characters of four of his species with tolerable confidence; of the remaining eight I have discussed *P. Wilsoni* below (under *P. propinqua*) and *P. fuscomaculata* (under *P. tumbyensis*). There still remain six on which I make the following notes:—*P. australica* is probably near *P. propinqua calida* and *longior*, but cannot be placed in my tabulation as the information is wanting whether its elytral interstices are costiform towards the apex. It seems to differ *inter alia* from *propinqua* by its prothorax having no basal impressions, from *calida* by its prothorax being rugulose laterally, and from *longior* by there being a row of large punctures on its elytra between the suture and the abbreviated stria. *P. carinata* I cannot place among my species, but it seems to be a very distinct species by the presence of a longitudinal linear carina on its clypeus. *P. Erichsoni* must be near *varipes*, differing *inter alia* by its elytral interstices subcostate near the apex. Concerning *P. laticeps* I cannot form any clear idea. *P. megalopoides* is probably near *calida*, differing *inter alia* by the front angles of its prothorax acutely directed outward. *P. submetallescens* is no doubt near *longior*, but differs by its elytral stria being "sulcate," whereas in *longior* the stria are quite lightly impressed.

It should be noted that, as far as my observations go, there are sexual differences in some at least of the Australian species of this genus in the antennæ being longer and the head and prothorax a little less closely and strongly punctured in the males than the females, so that slight differences in these characters cannot be relied on as specific.

A. Species not exceptionally parallel in form.

B. Interval between the eyes much greater than the width of an eye.

C. Prothorax strongly punctured.

D. Metallic species.

E. The abbreviated subsutural stria of the elytra quite traceable.

F. Front femora (at least partly) concolorous with their tibiæ.

G. Elytral interstices wide and but little convex behind.

H. Prothorax considerably less than twice as wide as long.

- I. Size moderate — more than 1 l. long... .. *calida*, Blackb.
- II. Size very small, at most scarcely 1 l. long... .. *noxia*, Blackb.
- HH. Prothorax very fully twice as wide as long ... .. *propinqua*, Baly.
- GG. Elytral interstices narrow and costiform behind ... .. *longior*, Blackb.
- FF. Front femora black (or nearly so) in strong contrast with their tibiae.
- G. Punctuation of prothorax very strong ... .. *varipes*, Blackb.
- GG. Punctuation of prothorax much less strong (almost fine) ... .. *minutalis*, Blackb.
- EE. Subsutural stria or row of punctures quite lost in confused punctuation.
- F. Punctuation of prothorax very strong and close ... .. *crebra*, Blackb.
- FF. Punctuation of prothorax much less strong and close ... .. *Olliffi*, Blackb.
- DD. Fulvous, non-metallic species.
- E. Punctuation of head close, continuous with that of prothorax ... .. *tumbyensis*, Blackb.
- EE. Punctuation of head sparse, much less close than that of prothorax ... .. *hypocrita*, Blackb.
- CC. Prothorax extremely finely punctured.
- D. Prothorax without longitudinal basal grooves.
- E. Punctures in the elytral striae coarse
- F. Antennae reaching considerably beyond base of prothorax ... .. *aciculata*, Blackb.
- FF. Antennae not reaching beyond base of prothorax ... .. *Albertisi*, Jacoby.
- EE. Punctures in the elytral striae fine... .. *brevicornis*, Baly.
- DD. Prothorax with a longitudinal basal groove on either side ... .. *laticollis*, Baly.
- BB. Interval between the eyes equal or nearly so to the width of an eye.
- C. Elytral interstices costiform and narrow near apex ... .. *impressipennis*, Blackb.
- CC. Elytral interstices not (or scarcely) convex behind ... .. *eyrensis*, Blackb.
- AA. Form elongate, parallel.
- B. Head subopaque, and with large feebly impressed punctures.
- C. Punctures of elytral striae coarse (much larger than those of the prothorax) ... .. *crassipennis*, Blackb.
- CC. Punctures of elytral striae much finer (about equal to those of the prothorax) ... .. *quadraticollis*, Blackb.
- BB. Head closely and evenly punctured.
- C. Discal interstices of elytra quite flat ... .. *pallidior*, Blackb.
- CC. Discal interstices of elytra more or less convex.
- D. Interstices of elytra not granulose ... .. *Meyricki*, Blackb.
- DD. Interstices of elytra granulose ... .. *Waterhousei*, Baly.



*P. calida*, sp. nov. Ovalis; convexa; nitida; ænea, viridi-vel auro-micans, antennis rufis apicem versus infuscatis, pedibus rufis (femoribus posticis aneis); capite sat lato, subfortiter plus minusve crebre punctulato, oculis inter se distantibus, sulcis interocularibus sat distinctis; antennis quam corporis dimidium (maris sat manifeste, feminae vix) longioribus, articulo 1° quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti (hoc quam ille manifeste longiori) sat breviori; prothorace quam longiori manifeste minus quam duplo latiori, maris minus fortiter minus crebre (feminae sat fortiter sat crebre) punctulato, antice sat angustato, lateribus leviter arcuatis, angulis anticis antrorsum acutis; elytris striatis, striis sat fortiter minus crebre punctulatis, interstitiis haud punctulatis leviter convexis postice haud costiformibus. Long.,  $1\frac{1}{5}$ — $1\frac{2}{5}$  l.; lat.,  $\frac{2}{5}$ — $\frac{7}{10}$  l.

Of this species, of which I have numerous examples apparently taken in company, some specimens are a little smaller than the majority with longer antennæ and their head and prothorax less closely and strongly punctured; I take them to be the males. The subsutural abbreviated stria is punctured a little confusedly but is quite well defined.

N. Queensland; taken by Mr. Koebele.

*P. longior*, sp. nov. Elongato-ovalis; sat convexa; sat nitida ænea, antennis rufo-testaceis plus minusve piceo-tinctis, pedibus rufo-testaceis femoribus plus minusve infuscatis exceptis; capite lato, sat fortiter minus crebre punctulato, oculis inter se valde distantibus, sulcis interocularibus distinctis; antennis quam corporis dimidium sat longioribus, articulo 1° quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti (his inter se longitudine sat æqualibus) vix breviori; prothorace quam longiori duplo latiori, fortiter crebre punctulato, antice vix angustato, lateribus fere rectis, angulis anticis extrorsum manifeste acutis; elytris leviter striatis, striis sat fortiter sat crebre punctulatis, interstitiis subtiliter punctulatis convexis postice angustis subcariniformibus. Long.,  $1\frac{1}{3}$  l.; lat.,  $\frac{1}{2}$  l.

Each joint of the antennæ after about the 3rd is more or less stained with piceous; the front part of the femora is more or less widely infuscate (in some examples only very narrowly).

S. Australia; near Port Lincoln.

*P. novia*, sp. nov. Ovalis; sat elongata; sat convexa; subnitida; obscure æneo-viridis, nonnullorum exemplorum pedibus anterioribus et tibiis tarsisque posticis plus minusve dilutioribus, antennarum basi testacea; capite sat lato, coriaceo et puncturis nonnullis distinctis im-

presso, inter oculos (his inter se distantibus) transversim impresso, inter antennas longitudinaliter convexo; antennis corporis dimidio longitudine sat æqualibus, articulo 1° sat elongato, 2° paullo breviori, 3° quam 2<sup>us</sup> subbreviori; prothorace quam longiori minus quam duplo latiori, confertim subtiliter punctulato, antice angustato, lateribus leviter arcuatis, angulis anticis extrorsum nullo modo directis; elytris vix striatis, striis vix crebre minus fortiter punctulatis, interstitiis sat planis subtiliter punctulatis; tibiis posticis apice valde mucronatis. Long., 1 l. (vix); lat.,  $\frac{1}{2}$  l.

This species must resemble *P. submetallescens*, Baly, in size and color but it differs from the description of that insect by the front angles of its prothorax being not in the least directed outward and the interstices of its elytra not being costate at the sides and apex. It is said to be destructive to vegetation.

N.S. Wales; near Wentworth; taken by Miss Cudmore.

*P. propinqua*, Baly. A species occurring somewhat plentifully near Adelaide is, I have little doubt, this insect. I expect that *P. Wilsoni*, Baly, is a mere variety. Unfortunately Dr. Baly has made no comparison between the two species and has used so nearly the same words in describing them that after a careful examination of the two descriptions the only clearly specified differences I can discover consist in *Wilsoni* being a trifle smaller than *propinqua*, having somewhat darker femora, the unpunctured part of the head less rugulose and the lateral punctures one or two less in number. It also seems to be implied that the small basal impressions on the prothorax of *propinqua* are wanting in *Wilsoni* and nothing is said about its front prothoracic angles being produced externally. I have examples (which I cannot separate specifically from those that agree perfectly with the description of *propinqua*) in which some of these trifling differences are apparent. *P. propinqua* appears to me to be a variable insect widely distributed in Southern Australia distinguishable from its congeners most readily by the sculpture of its head; the middle part is finely strigose or finely rugulose and almost impunctate, but there are a few large coarse punctures on each side near the hindmargin of the eyes. In typical specimens of *propinqua* the front part of the middle space on the head is very distinctly rugulose and the basal impressions of the prothorax are quite distinctly traceable; while the legs are entirely of a dull fulvous color, except the hind femora. I have this form only from the Adelaide district. From Yorke's Peninsula I have two examples which may be *Wilsoni* although their legs are not as darkly colored as those of the type of *Wilsoni* seem to have been. I have a number of specimens from the Port Lincoln dis-

trict which present slight uniform distinctive characters perhaps entitling them to be considered a local variety and which may be thus characterised :

Var. *lindensis*. Minor (long. 1 l.). Differt capitis parte mediana strigosa nec rugulosa ; prothorace ad basin vix manifeste impresso

(This variety differs from *Wilsoni* by its smaller size and fulvous legs, except the hind femora).

I have also some specimens from the higher mountains of Victoria which seem to represent a local race though hardly deserving to be considered a species ; they may be thus characterised :

Var. *alpicola*. Major (long.,  $1\frac{1}{2}$  l.). Differt capitis parte mediana subcoriacea, vix strigosa (subtilissime nec rugulose punctulata), puncturis magnis prope oculos sat numerosis ; prothoracis impressionibus basalibus sat distinctis.

(This variety differs from *Wilsoni* by its larger size, and legs, except the hind femora, entirely fulvous).

I may add that I find the angularity of the front corner of the prothorax a character that cannot be relied upon. In all the above mentioned specimens the front angles are more or less produced externally ; I have even specimens in which one angle seems more prominent than the other ; in the specimens from Port Lincoln and Yorke's Peninsula the angle seems less marked than in those from the Adelaide district and Victoria, in some examples it is scarcely traceable.

*P. varipes*, sp. nov. Ovalis, sat elongata ; nitida ; ænea, tibiis tarsisque rufis piceo-variegatis, antennis rufis (parte dimidia apicali infuscatis) ; capite convexo leviter crebre vix subtiliter punctulato, sulcis interocularibus sat profundis (ab oculorum parte postica ad antennarum basin fere recte ut lineæ sat subtiles extensis) ; antennis quam corporis dimidium haud longioribus, articulo 1<sup>o</sup> quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti haud breviori, his inter se sat æqualibus ; prothorace quam longiori minus quam duplo latiori, sat grosse sat crebre punctulato, quam caput distincte latiori, antice distincte angustato, lateribus vix arcuatis, angulis anticis paullo incrassatis sat acutis sed vix extrorsum directis ; elytris striatis, striis sat grosse nec confertim punctulatis (striae primæ puncturis vix confusis), interstitiis manifeste punctulatis vix convexis. Long.,  $1\frac{2}{5}$  l. ; lat.,  $\frac{2}{5}$  l.

Near *P. Olliffi*, Blackb., but of a less brightly brassy tone of color, with all the femora dark, the prothorax and elytral striæ considerably more strongly punctulate, and the interstices of the elytral striæ less flat.

N.S. Wales ; Blue Mountains.

*P. minutalis*, sp. nov. Ovalis, modice elongata; nitida; ut præcedens colorata; capite fere ut præcedentis sed sparsim subtiliter punctulato; antennis quam corporis dimidium sat brevioribus, apicem versus incrassatis, articulo 1° quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti breviori, 2° brevi (quam 3<sup>us</sup> sat breviori); prothorace fere ut præcedentis sed multo minus fortiter punctulato; elytris fere ut præcedentis sed striarum puncturis manifeste minoribus. Long.,  $\frac{4}{5}$  l.; lat.,  $\frac{3}{10}$  l.

This very small species is much like the preceding (*P. varipes*) in miniature but differs from it in its antennæ being much shorter with differently proportioned joints and in its very much more finely punctulate head and prothorax. In tabulating the species of the genus I have placed this one among those with the prothorax strongly punctulate, but with some hesitation; the puncturation of its prothorax however is much less fine than in the species in which I have called the prothoracic puncturation fine. Victoria.

*P. Olliffi*, Blackb. When I described this species I omitted to mention a character which though slight seems (from the examination of a considerable series of allied species) to be of some importance, viz., the presence on the portion of the elytra between the suture and the first complete stria of very coarse interstitial puncturation among which the shortened subsutural row of punctures is entirely untraceable.

*P. crebra*, sp. nov. Sat breviter ovalis; minus convexa; sat nitida; viridi-ænea, elytris plus minusve violaceo-micantibus, pedibus (femoribus posticis plus minusve infuscatis vel nigris vel violaceis exceptis) rufis, antennis obscuris basi dilutioribus; capite sat lato, crebre minus fortiter punctulato, oculis inter se distantibus, sulcis interocularibus leviter impressis; antennis quam corporis dimidium brevioribus, articulo 1° quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti breviori, hoc quam ille vix longiori sed multo graciliori; prothorace quam longiori vix duplo latiori, subgrosse sat crebre punctulato, antice leviter angustato, lateribus leviter arcuatis, angulis anticis haud extrorsum acutis; elytris fortiter punctulato-striatis, interstitiis leviter convexis levibus (1° excepto, hoc tam fortiter punctulato ut striæ primæ puncturæ sunt penitus confusæ). Long., 1 l.; lat.,  $\frac{3}{5}$  l. (vix).

A short broad species notable for the very coarse puncturation of its prothorax and the absence of a defined abbreviated subsutural stria, the space between the suture and the first complete stria being occupied with confused coarse puncturation devoid of linear arrangement.

N. Queensland; taken by Mr. Koebele.

*P. tumbyensis* (var. ? *P. fuscomaculata*, Baly). Elongato-ovalis; sat convexa; sat nitida; testacea, capite prothorace scutello elytrorumque maculis nonnullis infuscatis et æneo-micantibus, antennarum articulis (3 vel 4 exceptis) plus minusve piceo-tinctis; capite fortiter plus minusve crebre haud (vel parum) rugulose punctulato, sat lato, oculis inter se valde distantibus, sulcis interocularibus sat profundis; antennis quam corporis dimidium vix longioribus, articulo 1° quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti (hoc quam ille sat longiori) parum breviori; prothorace quam longiori duplo latiori, crebre subgrosse punctulato, antice parum angustato, lateribus rectis, angulis anticis manifeste extrorsum acutis; elytris fortiter punctulato-striatis, interstitiis punctulatis convexis postice angustis costiformibus. Long.,  $1\frac{1}{3}$  l.; lat.,  $\frac{1}{2}$  l.

The markings on the elytra are of a reddish fuscous color with a slight brassy tone; they consist of a subbasal fascia not reaching the lateral margins, a median fascia much narrowed about the suture, and a very faint subapical fascia; in some samples they are almost obsolete. It is possible that this is a local form of *P. fusco-maculata*, Baly, but I think it more probably a distinct species as it differs from the description not only in the markings of the elytra and the absence of infuscation on the under surface, but in several more important characters—notably in the straight sides of its prothorax. I have seen about half-a-dozen specimens which differ *inter se* only in the sculpture of the head (a sexual variation I believe) and the greater or less distinctness of the markings on the elytra.

S. Australia; Eyre's Peninsula, near Tumby.

*P. hypocrita*, sp. nov. Ovalis, sat elongata; sat convexa; sat nitida; testacea, capite prothoraceque rufescentibus, antennis apicem versus et femoribus posticis infuscatis; capite lato, sparsim grosse punctulato; oculis inter se valde distantibus, sulcis interocularibus minus profundis; antennis quam corporis dimidium subbrevioribus, minus robustis, articulo 1° quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti vix breviori, 2° quam 3<sup>us</sup> multo crassiori et sublongiori; prothorace quam longiori vix duplo latiori, fortiter sat crebre punctulato, antice parum angustato, lateribus fere rectis, angulis anticis manifeste extrorsum acutis; elytris modice striatis, striis confertim minus fortiter punctulatis, interstitiis vix convexis vix manifeste punctulatis. Long., 1 l.; lat.,  $\frac{2}{3}$  l.

Notable for the pale testaceous color of its elytra and the coarse sparse puncturation of its head.

W. Australia.

*P. aciculata*, sp. nov. Ovalis; convexa; nitida; ænea, antennis

(parte dimidia apicali nigra excepta) pedibusque (femoribus posticis aeneis exceptis) rufo-fulvis; capite sat lato, subtiliter ruguloso et puncturis nonnullis sparsim impresso, oculis inter se distantibus, sulcis interocularibus fortiter impressis; antennis quam corporis dimidium subbrevioribus sat robustis, articulo 1<sup>o</sup> quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti (his inter se sat æqualibus) paullo breviori; prothorace quam longiori minus quam duplo latiori, subtilissime strigoso et sparsius subtiliter (ad latera paullo magis fortiter) punctulato, antice (superne viso) sat angustato, lateribus leviter arcuatis, angulis anticis vix incrassatis nec extrorsum directis; elytris leviter striatis, striis sat grosse minus confertim punctulatis, interstitiis sat planis (latera apicemque versus leviter convexis) minus perspicue punctulatis. Long.,  $1\frac{1}{3}$  l.; lat.,  $\frac{1}{2}$  l.

This species is notable among its Australian congeners for the very fine punctures (resembling pricks with the point of a fine needle) sparsely distributed over the disc of its prothorax.

Victoria; on the higher mountains.

*P. impressipennis*, sp. nov. Ovalis; sat elongata; modice convexa; nitida; fulva, vix cupreo-micans, antennis apicem versus paullo (vel vix) infuscatis, pedibus rufo-testaceis; capite minus lato, coriaceo vel subtiliter ruguloso, oculis magnis inter se subapproximatis, sulcis interocularibus fortiter impressis ad oculos contiguis; antennis quam corporis dimidium longioribus, articulo 1<sup>o</sup> quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti (his inter se sat æqualibus) parum breviori; prothorace quam longiori fere triplo latiori, crebre fortiter punctulato, quadrato, quam caput multo latiori, antice haud angustato, mox intra marginem lateralem (hoc fere recto) longitudinaliter manifeste impresso, angulis anticis incrassatis plus minusve distincte extrorsum prominulis, basi utrinque fovea brevi obliqua impressa; elytris paullo pone basin manifeste transversim-arcuatim late impressis; fortiter punctulato-striatis, interstitiis subtiliter punctulatis convexis (latera apicemque versus sat fortiter costiformibus). Long.,  $1\frac{2}{3}$  l.; lat.,  $\frac{7}{10}$  l.

A very distinct species on account of its comparatively large size, its large subapproximate eyes, the well defined longitudinal impressions (almost sulci) just within the lateral borders of its prothorax, and the well defined wide shallow impression from shoulder to shoulder on its elytra. Owing to the interocular sulci on its head being very close to its eyes, the spaces on the head which Mr. Baly calls the "interocular spaces" are extremely narrow. I have two examples (from S. Australia) somewhat smaller than typical specimens; a little wider and less elongate,

with the front angles of their prothorax rather more strongly directed outward which may possibly represent a distinct species.

S. Australia.

*P. eyrensis*, sp. nov. Præcedenti (*P. impressipenni*) affinis; differt elytris multo minus fortiter striatis, striis multo minus crebre punctulatis, interstitiis planis (latera apicemque versus vix convexis). Long.,  $1\frac{3}{10}$  l.; lat.,  $\frac{2}{5}$  l.

Remarkably like the preceding but with very differently sculptured elytra. In *impressipennis* these have deep striæ with crowded punctures giving them a catenulated appearance, while in the present species the striæ are slight so that the sculpture is not very much more than rows of punctures on the surface, the several punctures in the rows being well isolated from their fellows. The very slight convexity of the interstices even near the apex and lateral margins further distinguishes this insect from the preceding.

S. Australia; near Lake Eyre.

*P. quadraticollis*, sp. nov. Elongata; subparallela; minus convexa; sat nitida; æneo-picea, antennis pedibusque fulvescentibus, illis apicem versus piceo-tinctis; capite lato, subtiliter strigoso et puncturis sat magnis leviter minus crebre impresso, sulcis interocularibus obsoletis, oculis inter se valde distantibus; antennis gracilibus quam corporis dimidium sat longioribus, articulo 1<sup>o</sup> quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti (his inter se sat æqualibus) vix breviori; prothorace quam longiori plus quam duplo latiori, crebre fortiter punctulato, quadrato, quam caput vix latiori, margine antico quam posticus latiori, lateribus fere rectis, angulis anticis incrassatis sed vix extrorsum directis; elytris leviter striatis, striis crebre minus fortiter punctulatis (striæ primæ puncturis sat confusis), interstitiis vix (apicem versus nullo modo) convexis vix manifeste punctulatis. Long., 1 l.; lat.,  $\frac{2}{5}$  l.

Seems to be allied to *P. Waterhousei*, Baly and *laticeps*, Baly (both from W. Australia) and to differ from them *inter alia* by the peculiar sculpture of its head, also by its prothorax being at its widest across the front.

S. Australia; Quorn, &c.

*P. pallidior*, sp. nov. Præcedenti valde affinis; differt statura majore, colore toto (antennis apicem versus infuscatis exceptis) brunneo-testaceo, capite haud strigoso crebre sat æqualiter punctulato, prothorace paullo minus fortiter minus crebre punctulato, elytrorum interstitiis subtiliter distincte punctulatis omnibus (externis 2 vix convexis exceptis) planis. Long.,  $1\frac{1}{4}$  l.; lat.,  $\frac{1}{2}$  l.

S. Australia.

*P. crassipennis*, sp. nov. Ovalis, sat elongata; sat nitida; subtus obscure rufescens, supra brunneo-testacea, (capite prothoraceque plus minusve rufescentibus), antennis testaceis (parte dimidia apicali plus minusve picescenti), pedibus testaceis (femoribus posticis plus minusve infuscatis) nonnullorum exemplorum sutura infuscata; capite fere ut *P. quadraticollis* sed sulcis interocularibus minus obsoletis (ab oculorum parte postica ad antennarum basin ut lineæ subtiles rectæ extensis) antennis fere ut *P. quadraticollis* sed subbrevioribus paullo robustioribus; prothorace quam longiori duplo latiori, subgrosse vix crebre punctulato, quam caput paullo latiori, antice distincte angustato, lateribus leviter arcuatis, angulis anticis parum incrassatis sat acutis sed haud extrorsum directis; elytris striatis, striis sat grosse nec crebre punctulatis (striæ primæ puncturis vix confusis), interstitiis leviter convexis vix manifeste punctulatis. Long., 1 l.; lat.,  $\frac{1}{2}$  l. (vix).

Allied to the preceding two species but readily distinguishable by the coarse comparatively sparse punctures of its elytral striæ. Its prothorax is by no means sparsely punctured but evidently less closely than that of *P. quadraticollis*. In this and the preceding two species the interval between the eyes is evidently wider than twice the width of an eye. In this species there is a perplexing variability in the depth of the larger punctures of the head and in the degree of convexity of the elytral interstices, hardly two specimens being quite alike in these respects.

S. Australia; Eyre's Peninsula.

*P. Meyricki*, sp. nov. Elongata; subparallela; sat nitida; piceo-brunnea, vix cupreo-micans, antennis testaceis (articulis ultimis 4 piceo-tinctis), pedibus testaceis (femoribus plus minusve infuscatis); capite lato, confertim subrugulose æqualiter punctulato, sulcis interocularibus obsoletis, oculis inter se valde distantibus; antennis minus gracilibus, quam corporis dimidium sat longioribus, articulo 1<sup>o</sup> quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti (hoc quam ille vix longiori) vix breviori; prothorace fere ut *P. quadraticollis* sed marginibus antico et postico latitudine æqualibus; elytris leviter striatis, striis minus crebre vix fortiter punctulatis (striarum primæ, et antice secundæ, puncturis confusis), interstitiis sat convexis vix perspicue punctulatis. Long., 1 l.; lat.,  $\frac{2}{3}$  l.

Near *P. quadraticollis* but differing from it and other allied species by the puncturation of its head which scarcely differs from that of its prothorax except in being a trifle closer with a distinct tendency to rugulosity. I have a specimen from W. Australia (which I take to be an immature example of this insect) entirely of a pale testaceous color.

W. Australia; taken by Mr. Meyrick.



## CREPIDODERA.

*C. indicica*, sp. nov. Elongato-ovalis; sat nitida; subtus obscura; supra cœrulea (colore fere indici), antennarum articulo basali apicem versus et 2° 3° que totis testaceis vel piceo-testaceis; capite lævi, inter oculos minus distincte transversim sulcato; antennis quam corporis dimidium paullo longioribus, articulis 1° 3° 4° que inter se longitudine sat æqualibus, 2° sat brevi; prothorace sat transverso, lævi, ante basin fortiter transversim sulcato (sulco transverso utrinque sulco longitudinali forti terminato), lateribus arcuatis, angulis distinctis vix acutis; elytris irregulariter subseriatim et confuse subtiliter punctulatis. Long.,  $1\frac{3}{4}$  l.; lat.,  $\frac{1}{5}$  l.

This species is well characterised by its elytral puncturation, the rows of which are extremely irregular owing to punctures about the same size as those of the rows (as well as some much smaller) being confusedly scattered about the interstices; near the apex the rows are scarcely traceable at all.

N. Queensland; sent to me by Mr. Masters.

*C. crassior*, sp. nov. Præcedenti (*C. indicicæ*) affinis; differt antennarum articulis 3—6 magis gracilibus, elytris regulariter seriatim grosse punctulatis (puncturis prope apicem confusis subtilioribus). Long.  $1\frac{1}{3}$  l.; lat.,  $\frac{3}{5}$  l. (vix).

Considerably smaller than the preceding and having the intermediate joints of the antennæ more slender so that the antennæ appear somewhat thickened towards the apex; also the puncturation of the elytra is very much coarser and (except towards the apex) is disposed in regular rows.

N. Queensland; taken near Cairns by Mr. Koebele.

OPISTHOPYGME (gen. nov. *Halticitarum*).

Corpus ovale, glabrum, minus convexum; antennæ 11-articulatæ, sat approximata, filiformes, quam corporis dimidium sat longiores, minus robustæ, articulo 1° modico, 2° quam 1<sup>us</sup> sat breviori, 3° quam præcedentes graciliori quam 1<sup>us</sup> vix breviori, 4° quam 3<sup>us</sup> subbreviori, 5° quam 1<sup>us</sup> sublongiori; prothorax latissime quadratus, paullo ante basin transversim profunde sulcato (sulco margines laterales attingenti, et utrinque cum basi sulco longitudinali profundo conjuncto); scutellum modicum; elytra profunde punctulato-striata inæqualia, epipleuris latis bene determinatis fere ad apicem continuis subhorizontalibus (extrorsum paullo inclinatis); pedes modici; tibiæ anteriores 4 muticæ, posticæ mucronatæ, his extus leviter canaliculatis; femora postica valde incrassata, subtus leviter canaliculata; tarsi postici quam tibiæ haud multo breviores, articulo basali quam sequentes 2 conjuncti paullo

longiori, articulo apicali valde inflato-dilatato; unguiculi appendiculati; coxæ anticæ minus elevatæ, inter se sat longe distantes, postice clausæ; mesosternum modicum.

The species for which I propose this new generic name is of great interest because the inflated claw joint of its hind tarsi in combination with its closed front coxæ refer it to M. Lacordaire's Group "*Monoplatites*" hitherto (so far as I can ascertain) only known as American. I cannot place it in any of the numerous previously described genera of the Group. Its maxillary palpi do not accord very satisfactorily with those of either of the sections into which M. Lacordaire divides the genera by the form of the maxillary palpi; the second joint is obconic, the third shorter than the second (but not much thicker than its apex) the fourth conic and a trifle longer than the second.

*O. Jacobyi*, sp. nov. Nitida; testaceo-ferruginea, antennis apicem versus infuscatis, elytris indeterminate brunneo-maculatis horum striis interrupte infuscatis; capite lævi, inter oculos transversim arcuatim sulcato; prothorace lævi (sulcis punctulatis exceptis), angulis anticis manifeste explanatis, posticis acutis, lateribus rectis; elytrorum striis apicem versus profundioribus, interstitiis convexis (apicem versus subcostatis). Long.,  $1\frac{2}{5}$  l.; lat.,  $\frac{4}{5}$  l.

The sulcation of the prothorax is unusual, there being an extremely strong sulcus running all across in front of the base, and also an equally strong longitudinal sulcus on either side running from the transverse sulcus to the base. On the elytra an ill defined depression runs hindward just within the humeral region and then bends towards the suture which it reaches so as to join its fellow of the other elytron thus causing the inner basal part of each elytron to appear elevated.

N. Queensland; named in honor of Mr. M. Jacoby well known as an accomplished specialist in the Phytophaga.

#### SUTREA.

The following species seem to be referable to this genus which has not been previously recorded as Australian, though well represented in New Guinea. Its principal characters are; antennæ approximate (of 11 joints), front coxal cavities open behind, mesosternum normal, hind tibiæ not sulcate (mucronate at apex), anterior four tibiæ unarmed, claw joint not dilated, prothorax devoid of impressions, margins of elytra evidently dilated.

*S. Mastersi*, sp. nov. Elongato-ovalis, minus parallela; sat convexa; nitida; testacea, antennis (basi testacea excepta) obscuris, elytrorum macula communi magna basali et parte

dimidia apicali nigris; capite lævi inter oculos transversim sulcato; antennis quam corporis dimidium paullo longioribus, articulis 3° 4° que inter se sat æqualibus; prothorace quam longiori plus quam duplo latiori, transversim quadrato, vix perspicue punctulato, lateribus leviter rotundatis; elytris subtiliter minus crebre punctulatis. Long.,  $2\frac{1}{3}$  l.; lat.,  $1\frac{1}{2}$  l. (vix).

The markings on the elytra of this species seem to be very different from those of the previously described ones.

N. Queensland; sent to me by Mr. Masters.

*S. speciosa*, sp. nov. Elongato-ovalis; minus parallela; modice convexa; nitida; testacea, abdomine (basi apiceque exceptis) obscuro, elytris (basi et marginis lateralis parte antica exceptis) violaceis; capite lævi inter oculos transversim sulcato; antennis quam corporis dimidium sat longioribus, articulis 3° 4° que inter se sat æqualibus; prothorace quam longiori vix duplo latiori, postice subangustato, vix perspicue punctulato, lateribus sat rotundatis; elytris paullo pone basin transversim impressis, vix punctulatis sed sparsim leviter granulatis. Long., 3 l.; lat.,  $1\frac{1}{2}$  l.

Probably near *S. violaceipennis*, Jac, but differing from it *inter alia* by the flavous base (and front part of the sides) of its elytra and its yellow scutellum.

N. Queensland; sent to me by Mr. Masters.

#### HALTICODES (gen nov. *Halticitarum*).

Corpus oblongo-ovale, modice convexum; antennæ 11-articulatæ, sat approximatæ, filiformes, quam corporis dimidium vix vel paullo longiores, minus robustæ, articulo 1° minus elongato, 2° brevi, 3° quam 1<sup>us</sup> sublongiori, 4° quam 3<sup>us</sup> paullo breviori; prothorax transversus, mox ante basin transversim sulcatus, sulco utrinque (sat longe a margine laterali) in basin recurvato; scutellum magnum triangulare; elytra quam prothorax manifeste latiora, confuse punctulata, marginibus lateralibus sat latis, epipleuris horizontalibus fere ad apicem continuata; pedes modici; tibiæ anteriores 4 brevissime, posticæ sat breviter, mucronatæ, his fere cylindricis; femora postica sat incrassata subtus canaliculata; tarsi postici sat elongati quam tibiæ dimidium sat longiores, articulo basali 2° 3° que conjunctis æquilongo, ultimo haud inflato; unguiculi appendiculati; coxæ anticæ sat elevata, postice apertæ; mesosternum sat magnum.

I cannot find that any genus has been characterised to which it is possible to refer the species for which I propose this name. Its facies is altogether that of *Haltica* to which genus it is ex-

tremely close structurally, but I do not see how it is possible to place it in *Haltica* as limited by Dr. Chapuis on account of the very different form of its prothoracic sulcus which (instead of running all across the segment and merging laterally in the *lateral* margin) bends hindward on either side at some distance from the lateral margin and so arrives at the *basal* margin but without being limited externally by anything like a longitudinal sulcus. I should feel some doubt as to whether the present insect is distinct from the very briefly characterised *Docema*, Waterh. were it not that the claws of the latter are described as "simple." Further distinctions of the present genus from the European *Halticæ* (e.g. *pusilla*, Duf.) will be found in the widened lateral margin of the elytra, in the elytral epipleuræ (which are horizontal, with their external edge well defined instead of becoming sublateral hindward with no well-defined carina limiting them externally), and in the considerably greater dilatation of the hind femora (which however are not so strongly dilated as those of *Arsipoda*). It is to be noted that the extremely short mucro of the anterior tibiæ is placed *above* (not below) the base of the tarsus and is very easily overlooked without careful observation.

*H. disparipes*, sp. nov. Ovals; sat nitida; subtus (prosterno et abdominis apice brunneis exceptis) piceo nigra; supra testaceo-brunnea, pedibus (femoribus posticis piceis exceptis) pallide brunneis, antennis (articulis basalibus 3 vel 4 testaceis exceptis) nigris; capite lævi, inter oculos transversim arcuatim sulcato; prothorace subquadrato, quam longiori plus quam duplo latiori, antice vix angustato, subtilius sparsim punctulato, lateribus vix arcuatis, angulis omnibus distinctis subacutis; elytris crebre fortiter confuse punctulatis. Long., 2 l.; lat.,  $\frac{9}{10}$  l.

Victoria; I have met with it only in mountainous places.

HYPHALTICA (gen. nov. *Halticitarum*).

Generi præcedenti (*Halticodi*) affinis; differt elytrorum marginibus lateralibus minus latis, epipleuris pone medium magis angustis, tibiis anticis distincte minus breviter (intermediis breviter) mucronatis, femoribus posticis magis dilatatis subtus planatis sed vix canaliculatis.

This is another ally of *Haltica* according to Dr. Chapuis' arrangement; its prothoracic transverse furrow is quite as in *Halticodes* but it seems necessary to separate it from that genus on account of the characters noted above, especially the presence of a very well defined mucro (in the usual position) at the apex of the front tibiæ. In some respects this genus as well as the

preceding resembles *Lactica* but it does not appear possible to associate with that genus species in which there are no distinct longitudinal sulci on the prothorax. It should be noted that the mucro of the intermediate tibiae is in *H. lauta* little more than a conical projection from the tarsal cavity which I have only been able to identify by removing the tarsus, but it undoubtedly is a small mucro.

*H. lauta*, sp. nov. Ovalis, sat elongata; minus convexa; sat nitida; lurida, antennis (articulis basalibus 3 vel 4 exceptis) nigris, corpore supra hic illic (praesertim elytris postice) indeterminate infuscato, corpore subts piceo; capite sparsim subtiliter punctulato, inter oculos leviter sulcato; antennarum articulo 3° quam 4<sup>ns</sup> haud longiori; prothorace quam longiori paullo plus quam duplo latiori, antice haud multo angustato, fere ut caput punctulato, lateribus leviter arcuatis, angulis omnibus distinctis nec acutis; elytris subtiliter (apicem versus vix distincte) subcrebre punctulatis. Long.,  $1\frac{1}{5}$  l.; lat.,  $\frac{1}{5}$  l.

In this species the transverse sulcus of the prothorax is well defined (a trifle more strongly than in the European *H. pusilla*, Duf.), and instead of running on to the lateral margin bends round obliquely to the base some little distance from the lateral margin, but without being bounded by anything that could rightly be called a longitudinal sulcus.

S. Australia; taken near Quorn.

*H. (?) anomala*, sp. nov. Ovalis, sat elongata; sat nitida; nigra, capite antennarum articulis basalibus 3 prothorace pedibusque testaceis; capite vix manifeste punctulato, inter oculos fortiter sulcato; antennis quam praecedentis magis robustis, articulo 3° quam 4<sup>ns</sup> haud longiori; prothorace quam longiori duplo latiori, antice parum angustato, subtiliter sat sparsim punctulato, transversim obsolete sulcato, lateribus sat arcuatis, angulis subacutis; elytris subtiliter sat crebre punctulatis; tibiis intermediis distincte mucronatis. Long.,  $1\frac{1}{2}$ — $1\frac{4}{5}$  l.; lat.,  $\frac{7}{10}$ — $\frac{4}{5}$  l.

I have some little hesitation in considering this species congeneric with *H. lauta* on account of the sulcus of its prothorax being very faintly marked and the mucro of its intermediate tibiae being quite well defined. These characters seem too slight to justify the creation of a new genus for a single species, but I look upon it as very probable that when the *Halticites* of Australia are more fully known it will be found that these two must be separated notwithstanding their similarity both in facies and general characters.

Victoria; Dividing Range.

*H. (?) occidentalis*, sp. nov. Subovata; sat nitida; lurida, antennis apicem versus vix infuscatis, capite postice rufopiceo, corpore supra hic illic indeterminate infuscato, corpore subtus magis obscuro; capite lævi, inter oculos bituberculato sed vix distincte sulcato; antennarum articulo 3<sup>o</sup> quam 4<sup>us</sup> manifeste longiori; prothorace quam longiori fere duplo latiori, antice manifeste angustato, subcoriaceo et sat obsolete punctulato, sat fortiter transversim sulcato, lateribus fortiter arcuatis, angulis obtusis; elytris fortiter sat crebre punctulatis; tibiis intermediis distincte mucronatis. Long.,  $1\frac{1}{2}$  l.; lat.,  $\frac{3}{4}$  l.

The species of Southern Australia appertaining to Lacordaire's group "*Halticites*" (outside the genus *Haltica*) differ in respect of facies and characters to an extent that would perhaps justify the creation of a separate genus for each of them. I am reluctant to follow this course, and so am placing in this genus *Hyphaltica* several forms that (appertaining to the *Halticites*) agree in the transverse sulcus of their prothorax being (not continued to the lateral margin but) bent round to the base before reaching the lateral margin, in their elytra not being exceptionally widely margined, and in their front tibiæ having a well-defined mucro placed in the normal position. The present species differs somewhat in facies from the preceding two, owing to its subovate form, and the strongly rounded sides of its prothorax.

#### W. Australia.

*H. mediocris*, sp. nov. Ovalis, sat elongata; sat nitida; lurida, scutello antennis (parte apicali excepta) et femorum parte superiori (basi excepta) infuscatis; capite lato, in medio fere lævi, ad latera punctulato, inter oculos transversim sulcato; antennis sat robustis, quam corporis dimidium paullo longioribus, articulo 3<sup>o</sup> quam 4<sup>us</sup> paullo longiori; prothorace fortiter transverso, postice paullo angustato, sublævi, sat fortiter transversim sulcato, lateribus sat arcuatis (latitudine majori ante medium posita), angulis bene determinatis subacutis; elytris subtiliter obsolete (circa scutellum magis perspicue) punctulatis; tibiis intermediis breviter distincte mucronatis. Long.,  $1\frac{3}{10}$  l.; lat.,  $\frac{2}{3}$  l.

The wide head of this species (the interval between the eyes being considerably more than the greatest diameter of an eye) and its not very convex eyes, together with the shape of its prothorax (wider in front than behind) give it a characteristic facies suggestive of generic distinctness from the others that I have provisionally associated in this genus; but it is certainly very close allied to them.

S. Australia; sent to me by Mr. Masters.

*H. Adelaide*, sp. nov. Ovals; sat elongata; sat nitida; supra nigra; subtus picea, antennis pedibusque rufescentibus, femoribus (præsertim posticis) plus minusve infuscatis vel nigricantibus; capite lato, in medio fere lævi, inter oculos sulcato; antennis sat robustis, quam corporis dimidium paullo longioribus, articulo 3<sup>o</sup> quam 4<sup>us</sup> multo longiori, hoc quam 2<sup>us</sup> subbreuiori; prothorace fortiter transverso, antice vix angustato, distincte minus crebre punctulato, fortiter transversim sulcato, lateribus leviter arcuatis, angulis minus acutis (anticis incrassatis extrorsum leviter directis); elytris crebre fortiter punctulatis; tibiis intermedii breviter distincte mucronatis. Long.,  $1\frac{1}{2}$  l.; lat.,  $\frac{4}{5}$  l. (vix).

A very distinct species on account of *inter alia* its entirely black upper surface.

S. Australia; Adelaide district.

#### HALTICA.

This genus as restricted by Dr. Chapuis may be taken to be limited to species that M. Allard's monograph would place in *Graptodera*. M. Allard suppresses *Haltica* altogether, but Dr. Chapuis' plea for retaining the name seems to me quite conclusive. The species are extremely variable and very difficult to determine. As regards the Australian species the best distinctive characters appear to me the sexual peculiarities of the males.

*H. corrusca*, Er. I am not sure that I know this species (which was described from Tasmania). The only Tasmanian *Haltica* known to me differs in important respects from Erichson's description. But there is a species occurring plentifully, and widely distributed in Southern Australia (Victoria, N.S. Wales and S. Australia, and probably in Tasmania), which agrees well with the description of *H. corrusca* in every respect except that (so far as regards the specimens I have seen) the violaceous coloring of the underside referred to by Erichson is wanting. It is an insect of brassy-æneous color (long., about  $2\frac{1}{3}$  l.) with well defined fairly close and rather fine elytral puncturation, and the longitudinal post-humeral sulcus very faint. Its males (apart from the dilatation of the basal joint of the tarsi) are distinguished by the sculpture of the apical ventral segment, which is devoid of tubercles and has its apical half (or thereabouts) flattened so as to be on a lower plane than the front part from which in certain lights it seems to be separated by a sulcus; the middle part of its apical margin (which must not be confused with the free edge of the pygidium seen beyond it) is rounded but owing to inequalities on its surface immediately before the apex it appears (from a point of view whence the true apex does

not catch the eye) to be trilobed. Its intermediate tibiae are straight or nearly so.

*H. splendida*, Oliv. I have not seen any insect at all likely to be this species; the description of it seems possibly consistent with its being a true *Haltica*.

*H. ferruginis*, Blackb. I regard this insect as possibly representing a gen. nov. near *Haltica*. As far as I know the species that may be rightly regarded as typical members of *Haltica*, they are invariable in being of some dark (more or less metallic) color, and in having a prothoracic sulcus completely traversing the segment in complete separation from its base. *H. ferruginis* however not only is of a nearly uniform brownish-testaceous color, but has its prothoracic sulcus less distinctly complete than in a typical *Haltica* inasmuch as near the lateral margins it seems to lose itself in a mere basal depression (there being in that part no elevated interval between it and the true basal margin). The combination of these two differences from a normal *Haltica* points to the likelihood of other species allied to it existing in N.W. Australia (which is its habitat). Its prothoracic sulcus is not much like that of either of the new genera (*Hyphaltica* and *Halticodes*) characterised above. As far as I can see its four anterior tibiae are unarmed but the type is not in a condition to allow of my thoroughly investigating the question whether a very small mucro may be hidden among the apical setae. I cannot find any named genus other than *Haltica* in which it might be placed, although it is very difficult to arrive at certainty regarding some of Baly's genera owing to their author having merely enumerated their characters without mentioning what genera they are allied to.

*H. pagana*, sp. nov. Ovalis, minus elongata; nitida; cerulea vel purpurea, antennis tibiisque obscuris; capite sublævi, inter oculos transversim sulcato, ante sulcum bituberculato; antennis quam corpus (maris haud multo, feminae paullo magis) brevioribus, sat robustis (articulo basali modico, 2° brevi, 3° quam 1<sup>us</sup> vix breviori, 4° quam 3<sup>us</sup> vix longiori); prothorace sat transverso, antice sat angustato, in disco lævi, latera versus distincte punctulato, ante basin sat profunde sulcato, lateribus sat arcuatis; elytris sat crebre sat fortiter (quam *H. pusilla*, Duf., paullo minus crebre vix minus fortiter) punctulatis, ad latera obsolete sulcatis (sulco ante medium extus vix manifeste carinato).

Maris tibiis intermediis sat rectis; segmento ventrali apicali in medio postice rotundato, nullo adpectu trilobato, mox ante apicem bituberculato. Long.,  $2\frac{2}{5}$  l.; lat.,  $1\frac{1}{5}$  l.

Much like *H. australis*, Blackb., but a more richly colored insect, with less close elytral puncturation, and the apical ventral



segment of the male quite different. The antennæ of the male are about three-quarters the length of the body.

Victoria and Tasmania; in mountainous places.

*H. grävada*, sp. nov. Elongato-ovalis; sat nitida; ænea, corpore subtus antennis pedibusque obscuris; capite antennisque fere ut præcedentis, sed his paullo brevioribus; prothorace minus transverso (quam longiori circiter quarta parte latiori), subcoriaceo et sparsim subtiliter (latera versus magis grosse) punctulato, antice parum angustato, ante basin sat profunde sulcato; lateribus minus arcuatis; elytris sat crebre sat subtiliter subobsolete punctulatis, ad latera fortiter sulcatis (sulco et intus et extus longe ultra medium carina forti marginato).

Maris tibiis intermediis (exempli typici) extrorsum fortiter curvatis; segmento ventrali apicali ad apicem certo adspectu fortiter trilobato. Long.,  $3-3\frac{1}{2}$  l.; lat.,  $1\frac{1}{3}$  l.

Resembles in general appearance and color the species mentioned above as being probably *H. corrusca*, Er., but *inter alia* much larger, with the lateral furrows and carinæ of its elytra very much stronger. The apical ventral segment does not present much difference, but the extraordinary middle tibiæ of its male which are very strongly bent outwards at the apex (if not a deformity of the unique male that I have seen) furnish a very striking character. In any case the present species is an extremely distinct one. I have two female examples from N.S. Wales which I attribute to this species but cannot be sure of their identity without knowing their male.

S. Australia; Murray River District, &c.

The following table shows the distinctive characters of the species attributed to Australia that there seems to be more or less reason to regard as true *Halticæ* (the doubt, in my opinion, being about the first two):—

A. Underside testaceous.			
B. Elytra testaceous	...	...	... <i>ferruginis</i> , Blackb.
BB. Elytra metallic	...	...	... <i>splendida</i> , Oliv.
AA. Underside dark.			
B. Sublateral sulcus of elytra feeble and not limited by a sharply defined carina.			
C. Apical ventral segment of male not tuberculate.			
D. Upper surface metallic blue or purple	...	...	... <i>australis</i> , Blackb.
DD. Upper surface æneous or bronzy	..	..	... <i>corrusca</i> , Er.
CC. Apical ventral segment of male bituberculate	...	...	... <i>payana</i> , Blackb.
BB. Sublateral sulcus of elytra strong and limited by a sharp carina.			
C. Apical ventral segment of male with a large impression before the apex (color brassy) ...			
CC. Apical ventral segment of male even or nearly so (color coppery)	...	...	... <i>grävada</i> , Blackb.
	...	...	... <i>imæa</i> , Blackb.

## LONGITARSUS.

- L. Victoriensis*, sp. nov. Ovalis; sat nitidus; fusco-testaceus, capite rufescenti, antennis extrorsum labro et femoribus posticis infuscatis; antennis sat gracilibus quam corpus vix brevioribus, articulo 1° quam sequentes 2 conjuncti vix breviori, 3° quam 2<sup>us</sup> sat longiori quam 4<sup>us</sup> paullo breviori; capite vix punctulato, in vertice plus minusve distincte transversim strigato; prothorace transversim subquadrato, crebre fortiter punctulato, lateribus leviter arcuatis; elytris fortiter subseriatim punctulatis. Long., 1 l.; lat.,  $\frac{1}{2}$  l. (vix).

Very like *L. luridus*, Gyll.; differing from that species especially by its elytral puncturation evidently a little closer and less coarse, and much more disposed to a seriate arrangement; also by the usually well-marked transverse strigosity of the hind part of its head.

Victoria; Alpine district.

## APHTHONA.

- A. Cowleyi*, sp. nov. Ovalis, sat elongata; nitida; antennis extrorsum labro et (ex parte) femoribus posticis piceis, tibiis plus minusve infuscatis; capite lævi inter oculos sulcato; antennis quam corporis dimidium vix longioribus, articulo 1° modico, 2° minus brevi, 3° quam 2<sup>us</sup> sat longiori (1° longitudine sat æquali), 4° 3° æquali; prothorace subtilissime punctulato, subquadrato, antice leviter angustato, pone marginem anticum lateribus subangulatis; elytris quam prothorax minus nitidis vix manifeste punctulatis; coxis anticis apertis; tibiis omnibus breviter mucronatis, posticis extus sat longe sat manifeste longitudinaliter sulcatis; tarsorum posticorum articulo basali sequentibus 2 longitudine æquali. Long.,  $1\frac{3}{4}$  l.; lat.,  $\frac{1}{5}$  l.

In this species the hind tibiæ are somewhat more decidedly sulcate externally than is usual in *Aphthona*, but I can find no other character inconsistent with a place in that genus. Apparently near *A. papuensis*, Jac, but considerably larger, with more transverse prothorax, &c.

Northern Australia; taken by Mr. Cowley, near Cairns.

## XUTHEA (?)

I feel considerable hesitation in assigning the following species to this East Indian genus, which is not known to me in nature. But it agrees with the diagnosis in all essential characters and certainly ought to be placed very near *Xuthea*. Its front coxæ are open behind, its prothorax has a strong transverse sulcus sharply limited by a short longitudinal sulcus on either side; its

antennæ are 11-jointed; its mesosternum is normal; all its tibiæ are mucronate; and the claw joint of its hind tarsi is normal. These are the structural characters of *Xuthea* and I cannot find that they have been attributed to any subsequently named genus. It is likely enough that a comparison of types might render it desirable to separate the insect described below from *Xuthea* but meanwhile I think it should be provisionally referred to that genus. It evidently bears much specific resemblance to the type of *Xuthea*, though it is considerably smaller.

*X?* *formosa*, sp. nov. Elongato-ovalis; nitida; tota læte cærulea, antennis obscuris basin versus vix rufescentibus exceptis; capite lævi, inter oculos transversim arcuatim sulcato; oculis grosse granulatis; antennis quam corporis dimidium vix longioribus, apicem versus gradatim manifeste incrassatis, articulo 1° parum elongato, 2° quam 1<sup>us</sup> sat breviori, 3° 1° longitudine æquali, 4° quam 3<sup>us</sup> paullo breviori, 5° 3° longitudine æquali et paullo magis robusto; prothorace sublævi, antice angustato, ante basin profunde transversim sulcato (sulco transverso utrinque in sulco profundo longitudinali terminato); elytris subtiliter minus regulariter seriatim punctulatis, nullo modo striatis; coxis antiæis apertis, tibiis omnibus breviter mucronatis tarsorum posticorum articulo basali sequentibus 2 longitudine æquali. Long., 1 l.; lat.,  $\frac{2}{5}$  l. (vix).

Its brilliant metallic blue color (almost as bright on the under-surface and the legs as on the elytra) renders this a very beautiful little insect. The color of the legs underlying their blue iridescence is of a somewhat pitchy testaceous tone. The basal joint of the antennæ is somewhat shorter than in most *Halticidæ*. The mucro at the apex of the anterior 4 tibiæ is placed among coarse setæ and needs looking for.

N. Queensland; taken by Mr. Koebele, near Cairns.

#### SPHÆRODERMA.

*S. baldiensis*, sp. nov. Late ovalis; nitida; rufo testacea, antennarum articulis ultimis 5 obscuris; capite transversim profunde arcuatim sulcato (sulco pone oculos, ut *S. testacea*, Fab., continuo), in vertice punctulato et longitudinaliter striatim ruguloso; antennis quam corporis dimidium brevioribus, articulis ultimis 5 gradatim incrassatis, articulo 1° modico, 2° minus brevi (quam 1<sup>us</sup> fere duplo breviori), 3° quam 2<sup>us</sup> graciliori sed vix longiori, 4° 6° inter se sat æqualibus (quam 3<sup>us</sup> subbrevioribus); prothorace transverso, transversim convexo, subfortiter sat sparsim punctulato; elytris sparsim sat fortiter (quam *S. testacea*, F., magis sparsim vix magis fortiter) punctulatis; femoribus posticis modicis. Long., 1  $\frac{2}{5}$  l.; lat.,  $\frac{4}{5}$  l.

The structural characters seem to be altogether those of the European species of the genus unless the shortness of the antennæ be considered aberrant; many species with short antennæ from Java, &c., have, however, been attributed to *Sphaeroderma*.

Victoria; Alpine district.

PSYLLIODES.

*P. lubricata*, sp. nov. Elongato-ovata; pernitida; supra æneo-viridis, prothorace aurato, antennis piceis basin versus testaceis; subtus piceo-nigra, pedibus rufis (femoribus plus minusve æneo-tinctis; capite sublævi; prothorace fortiter transverso, lateribus pone apicem fortiter dentatis, disco sparsius minus fortiter (lateribus sat crebre sat grosse) punctulato; elytris leviter striatis, striis crebre sat fortiter punctulatis, interstitiis planis (apicem versus leviter convexis) subtilissime punctulatis; tibiaram posticarum processu apicali quam tibia tota plus quam triplo breviori, ad latera pectinato, ad apicem fortiter bidentato. Long., 1<sup>3</sup> l.; lat.,  $\frac{4}{5}$  l.

The reddish-testaceous color of the legs (including the femora),—only in places with a brassy metallic tone overlying the red color,—distinguishes this species from its allies; it is also notable for the flat interstices (only feebly convex near the apex) of its elytral striæ.

Victoria; Black Spur.

(Sub-tribe) GALERUCIDES.

The Australian Polynesian and Papuan *Phytophaga* of the sub-tribe *Galerucides* present considerable difficulties to thier student owing to the great uncertainty that exists in respect of some of the genera—an uncertainty notably illustrated by the frequency of the mark “?” after the generic designations of species described by even well known specialists. In a recent investigation of the *Galerucides* of my collection I have found among those insects many species previously undescribed, but in several instances have been unable to reach any confident conclusion as to what is their right generic position. As this difficulty arises mainly from the faultiness of generic diagnoses there does not appear to be any escape from it, and I must therefore follow the same course that others have adopted and in some cases indicate a doubt as to the correctness of my generic determinations.

Authors in general seem to be fairly agreed that the structure of the prosternum is the character on which the primary subdivision of the tribe should be founded. Dr. Chapuis (Gen. Col. vol. XI.) recognises two distinct forms of this structure indicated by the cavities of the front coxæ being either open or closed

behind. Subsequently Dr. Baly (Journ. Linn. Soc. XX) while accepting the prosternal structure as the basis of classification regards (not the closure of the cavities but) the relation between the prosternum and the hind margin of the antepectus as the true index of that structure, and indicates two forms of the relation in either of which the cavities may be either open or closed. He considers that both conditions of the cavities may exist within the limits of a genus.

Now I venture to think that for the purposes of classification, at our present stage of knowledge, something else than the anatomical importance of characters ought to be taken into account—viz., the facility or otherwise of observing them. It is usually necessary to injure a specimen to find out even whether its coxal cavities are open or not; it is always necessary to do so in order to examine the relation between the prosternum and the hind-margin of the antepectus. I cannot but regard this proposal of Dr. Baly's as somewhat of the nature of his classification of *Paropsis* where he finds a primary character in the internal organs of the hind body.

The divergence between these specialists however suggests a doubt whether they agree practically as to the limits of a given genus and creates a great difficulty in dealing with the species they have described. I find Dr. Baly's classification impracticable and greatly prefer to make use of Dr. Chapuis'. It appears to me however that even Dr. Chapuis is not quite clear in his definition of the terms "open" and "closed" in dealing with the coxal cavities. He says that when the coxal cavities are open the base of the true prosternum (by which he means the hind margin, behind the coxæ, of the middle part of the prosternum as a whole) does not join the inward prolongation of the prosternal epimera. But there are very few cases in which this juncture is absolutely wanting, and I find from the dissection of numerous specimens that his test practically is whether the base of the true prosternum meets the *apex* of the inward prolongation of the epimera, or whether the apex of the epimera is freely applied against the coxa. In the former case (which is exemplified in *Adimonia*, *Monolepta*, &c.) Dr. Chapuis regards the coxal cavity as closed; in the latter (exemplified by *Aulacophora*, *Luperus*, &c.) he regards it as open. I treat the terms "open" and "closed" (as applied to the coxal cavities) in this sense.

#### OIDES.

- O. insignipennis*, sp. nov. Elongato-ovata; flava, antennis (articulis basalibus flavo-variegatis exceptis) vittisque in elytris 2 latissimis (his postice conjunctis) piceo-nigris, tibiis externe tarsisque infuscatis; antennis robustis quam corpus

circiter tertia parte brevioribus, articulo 3<sup>o</sup> quam 2<sup>us</sup> duplo longiori quam 4<sup>us</sup> paullo breviori quam 5<sup>us</sup> vix breviori; capite inter oculos profunde transversim sulcato, fronte longitudinaliter vix impressa; oculis minus prominulis; prothorace quam longiori paullo plus quam duplo latiori, fere æquali, subfortiter minus crebre sat æqualiter (et latera versus confertim subtilissime) punctulato; elytris dupliciter (sc. sat crebre subtilissime et sat crebre vix subtiliter) nullo modo rugulose punctulatis. Long., 4 l.; lat., 2 $\frac{2}{3}$  l.

The elytral vittæ are considerably wider than the yellow stripes, so that the elytræ are more black than yellow. The greatest width across the elytra is nearly four times the width of the prothorax and the elytra are fully six times longer than the prothorax. The hind angles of the prothorax are by no means rounded off but well-defined obtuse angles. At once distinguished from *O. Fryi*, Clk., by *inter alia* the absence of a transverse prothoracic impression, the less close puncturation (devoid of any rugosity) of the elytra, and its less prominent eyes.

Queensland; Port Mackay; sent to me by Mr. Lower.

*O. ocellaris*, sp. nov. Elongato-ovata; flava, antennarum articulis 2<sup>o</sup>—8<sup>o</sup> in parte (9<sup>o</sup>—11<sup>o</sup> totis) vittisque in elytris 2 modice latis (his postice conjunctis) piceo nigris, tibiis externe tarsisque infuscatis; antennis minus robustis quam corporis dimidium paullo longioribus, articulo 3<sup>o</sup> quam 2<sup>us</sup> duplo longiori quam 4<sup>us</sup> sat breviori quam 5<sup>us</sup> vix breviori; capite fere ut præcedentis (*O. insignipennis*); oculis sat prominulis; prothorace fere ut præcedentis sed partis lateralis puncturatione subtili multo minus conferta minus subtili; elytris fere ut præcedentis punctulatis. Long., 4 l.; lat., 2 $\frac{2}{3}$  l.

Allied to the preceding but with the vittæ (especially the external one) of the elytra narrower, the antennæ shorter and less robust, the eyes considerably more prominent, the excessively close and fine puncturation on the sides of the prothorax wanting, &c. At once distinguishable from *O. Fryi*, Clk., by the puncturation of the elytra not showing any tendency to rugosity, the absence of the transverse prothoracic impression, &c.

N. Queensland; taken by Mr. Cowley.

*O. ignota*, sp. nov. Elongato-ovata; rufo-flava, antennis articulo 1<sup>o</sup>—3<sup>o</sup> parte inferiori dilutiori) vittisque in elytris 2 modice latis (his postice conjunctis) piceo-nigris, tibiis externe tarsisque infuscatis; antennis robustis quam corpus circiter tertia parte brevioribus, articulo 3<sup>o</sup> quam 2<sup>us</sup> haud duplo longiori quam 4<sup>us</sup> tertia parte breviori quam 5<sup>us</sup> manifeste breviori; capite fere ut *O. insignipennis*; oculis minus prominulis; prothorace quam longiori fere triplo latiori,

ante medium transversim late impresso (parte concave utrinque abbreviata), sat crebre subgrosse punctulato, margine postico retrorsum late rotundato, angulis posticis rotundatis; elytris dupliciter (sc. sat crebre subtiliter et sat crebre fortite) nec rugulose punctulatis. Long.,  $4\frac{1}{3}$  l.; lat., 3 l. (vix).

A fine large species, at once distinguishable from its allies by the strong puncturation of its upper surface; the comparatively long second joint of its antennæ is also a notable character.

N. Australia; I am not sure of the exact locality.

*O. tigrina*, sp. nov. Ovalis; flavo-testacea, antennarum articulis 1<sup>o</sup>—8<sup>o</sup> in parte (9<sup>o</sup> 11<sup>o</sup> totis) vittis in elytris 4 angustis capite postice prothoracis maculis nonnullis metasterni parte magna femoribus (basi excepta) tiliarum parte magna tarsisque piceis; antennis minus robustis quam corporis duæ partes longioribus, articulo 3<sup>o</sup> quam 2<sup>us</sup> haud duplo longiori quam 4<sup>us</sup> tertia parte breviori quam 5<sup>us</sup> paullo breviori; capite inter oculos profunde transversim sulcato, fronte longitudinaliter manifeste impressa; oculis sat prominulis; prothorace quam longiori duplo latiori, ante medium transversim interrupte leviter impresso, coriaceo et sparsim inæqualiter leviter punctulato, angulis posticis rotundatis, margine postico retrorsum late rotundato; elytris dupliciter (sc. subtilissime minus crebre et sat crebre fortius) vix subrugulose punctulatis. Long., 4 l.; lat.,  $2\frac{3}{10}$  l.

Differs from its immediate allies in its somewhat regularly oval shape, also in there being four dark vittæ on each elytron. These are of about equal width and do not reach the apex. The subsutural one becomes gradually darker and more defined from the base hindward; the second and third coalesce near their hinder end (their common stem coalescing with the other two a little before the apex of the elytron); the external one exists only in the hinder third part of the elytron. The previously described Australian species of *Oides* having testaceous or yellow elytra ornamented with dark vittæ (more than one on each elytron) are *Fryi*, Clk., *seminigra*, Clk., and *6-vittata*, Duviv. Of these I know only the first except by description. The second is described as having its prothorax black with the margins reddish yellow. (I have seen no *Oides* with prothoracic colors at all approaching this description.) The third is said to have very short antennæ not reaching the middle of the elytra, the disc of the prothorax with only a few extremely fine punctures, and the elytra with more than two vittæ—characters which distinguish it from all the species of *Oides* known to me. The following table shows the characters of the species of this group of *Oides*:—

- A. Prothorax yellow or yellowish, with no (or scarcely any) dark coloring.
- B. Antennæ elongate (not less than  $\frac{2}{3}$  the length of the body).
- C. Puncturation of prothorax more or less feeble.
- D. Two vittæ on each elytron ; form elongate-ovate.
- E. Puncturation of elytra not in the least rugulose ... .. *insignipennis*, Blackb.
- EE. Puncturation of elytra distinctly rugulose ... .. *Fryi*, *Clk.*
- DD. Four vittæ on each elytron ; form oval *tigrina*, Blackb.
- CC. Puncturation of prothorax strong and deep *ignota*, Blackb.
- BB. Antennæ shorter.
- C. Elytra with two vittæ each ... .. *ocularis*, Blackb.
- CC. Elytra with more than two vittæ each ... 6-vittata, Duviv.
- AA. Prothorax black, with only the margins yellowish .. .. *seminigra*, *Clk.*

*O. velata*, sp. nov. Late ovalis ; pallide flava, capite postice et elytrorum maculis binis (altera minori basali subrotundata, altera magna subapicali subovali longitudinaliter posita), antennarum articulis  $4^{\circ}$ — $6^{\circ}$  ad apicem (et  $7^{\circ}$ — $11^{\circ}$  totis) tibiæ apice tarsisque infuscatis ; antennis quam corporis dimidium parum longioribus, articulo  $3^{\circ}$  quam  $2^{\text{us}}$  duplo longiori  $4^{\circ}$  sat æquali quam  $5^{\text{us}}$  sat longiori ; capite inter oculos profunde transversim sulcato ; oculos sat prominulis ; prothorace quam longiori paullo plus quam duplo latiori, antice sat angustato, leviter vix crebre punctulato, disco utrinque fovea magna sat fortiter impresso, angulis posticis sat rotundatis ; elytris fere ut prothorax punctulatis. Long.,  $4\frac{4}{5}$  l. ; lat.,  $2\frac{1}{5}$  l.

The basal spot on each elytron is transversely subrotundate and is much nearer to the suture than to the external margin. The subapical spot is somewhat obliquely placed ; it is twice as long as wide, oval in form but with its front subtruncate, commencing not much behind the middle of the elytron and all but reaching the apex.

Queensland ; sent to me by Mr. Masters.

*O. plantarum*, sp. nov. Ovalis ; pallide straminea, elytris pallide brunneo-testaceis, antennarum articulis  $2^{\circ}$ — $4^{\circ}$  ad apicem (et  $5^{\circ}$ — $11^{\circ}$  totis) tibiæ apice tarsisque infuscatis ; antennis quam corporis dimidium paullo longioribus, articulo  $3^{\circ}$  quam  $2^{\text{us}}$  duplo longiori quam  $4^{\text{us}}$  vix breviori quam  $5^{\text{us}}$  paullo longiori ; capite inter oculos leviter transversim sulcato, fronte longitudinaliter impressa ; oculis parvis ; prothorace quam longiori duplo latiori, antice sat angustato, obsolete punctulato, disco utrinque fovea et postice sulco transverso brevi impresso, angulis posticis rotundatis ; elytris sparsim subtilissime punctulatis. Long., 4 l. ; lat., 2 l.



Somewhat resembles *O. antennalis*, Baly, but is more narrowly oval in form with much shorter antennæ and much less closely and distinctly punctured elytra, &c.

N. Queensland.

#### AULACOPHORA.

*A. denticornis*, sp. nov. Testacea, elytrorum parte basali et macula magna subapicali rubropurpureis, pedibus posticis plus minusve infuscatis; capite prothoraceque lævibus; hoc quam longiori vix dimidio latiori; elytris distincte punctulatis; metasterno nonnihil rubro-infuscato.

Maris capite inter oculos profunde biimpresso, utrinque inter partem impressam et oculum sat alte cristato; antennarum articulis basalibus 5 deformibus (sc. basali elongato extus emarginato et dentato, 2° minuto extus dentato, 3° magno triangulari ad apicem extrorsum fortiter producto, 4° quam 3<sup>us</sup> longiori compresso ad apicem truncato 5° quam 3<sup>us</sup> vix longiori ad apicem extus fortiter producto (partis productæ margine antico profunde emarginato et biacuto.

Feminae capite sat æquali, antennis simplicibus quam corporis dimidium paullo longioribus. Long.,  $3\frac{1}{5}$  l.; lat.,  $1\frac{3}{5}$  l.

The elytra are divided into three somewhat equal zones of color—the basal one-third part purplish red, the middle one-third testaceous, the apical one-third purplish red; the apical purplish red color however does not quite reach the suture. The male characters in the head and antennæ are more strongly marked than in any other *Aulacophora* known to me.

N. Queensland; taken by Mr. Cowley near Cairns.

*A. cucullata*, sp. nov. Fem. Testacea; elytrorum parte basali tertia nigra, tibiis tarsisque anterioribus 4 plus minus infuscatis, pedibus posticis (femorum basi excepta) fere nigris; capite prothoraceque obsolete punctulatis; hoc quam longiori fere duplo latiori; elytris sparsim subtiliter punctulatis; antennis quam corporis duæ partes longioribus, articulo 3° quam 4<sup>us</sup> vix breviori. Long.,  $3\frac{3}{5}$  l.; lat.,  $2\frac{3}{10}$  l.

I cannot find among the numerous described species of *Aulacophora* any the coloring and markings of which bear much resemblance to those of the present species.

#### AGELASTICA.

*A. (Galeruca) melanocephala*, Fab. There does not appear to be any doubt that this species is an *Agelastica*. It is clearly identical with the *Agelastica* that Dr. Baly described under the same specific name. Of course Fabricius is the earlier describer to whom the original name must be attributed. I believe this synonymy has not been previously noted. The species stands in

Mr. Masters' Catalogue as *Monolepta melanocephala*, Fab., and also as *Agelastica melanocephala*, Baly.

## CALLIPEPLA.

*C. sexsignata*, Boisd. I have received from Mr. Masters and Mr. French (as taken in tropical Queensland) specimens of an insect which seems likely to be this scarcely described N. Guinea species.

## PRASYPTERA.

*P. Mastersi*, sp. nov. Flava; elytris metallico-viridibus vel cyaneo-viridibus, labro (antice) palpis (basi excepta) mandibulis (basi excepta) antennis (articulo apicali flavo excepto) genibus tibiis tarsisque piceis; prothorace transversim irregulariter impresso, leviter punctulato; elytris sat crebre punctulatis. Long., 4 l.; lat.,  $2\frac{1}{3}$  l.

Differs in coloration and other characters from all the previously described members of the genus, which has not previously (to my knowledge) been recorded as occurring in Australia.

N. Queensland; sent to me by Mr. Masters.

## SASTRA.

*S. costatipennis*, Jac., var. *obscuricornis*. A typo differt antennis (articulo basali subtus dilutiori excepto) nigro-piceis; elytrorum sutura (apice angustissime flavescenti excepto) cum superficie concolori, costa interna haud ultra medium extensa. Long.,  $5\frac{2}{5}$  l.; lat.,  $2\frac{3}{5}$  l.

Although from its large size and differences of coloration this insect appears to a casual glance very distinct from *S. costatipennis* I think it very likely to prove a mere local form of that insect, to which it is at any rate very closely allied.

N. Queensland.

## MOMÆA.

*M. eximia*, sp. nov. Elongata; subparallela; testacea, elytris vitta lata discoidali læte viridi ornatis, antennis tarsisque picescentibus; antennis quam corpus paullo brevioribus, articulo 3<sup>o</sup> quam 4<sup>us</sup> manifeste breviori; prothorace leviter transverso, sat æquali, sparsim subtiliter punctulato, lateribus rotundatis, angulis subtuberculiformibus; elytris confertim minus subtiliter punctulatis; tarsorum posteriorum articulo basali quam sequentes 2 vix longiori. Long.,  $2\frac{4}{5}$  l.; lat., 1 l.

The bright green vitta on each elytron commences on the shoulder and runs back widening almost to the apex, so that the common testaceous interval between the two vittæ is in the form of a very elongate triangle with its base on the base of the elytra; the testaceous lateral margin is very narrow.

This species seems clearly to appertain to *Momæa* on account of its front coxæ open behind, bifid claws, unarmed and externally carinate tibiæ, long antennæ, narrow parallel form, &c. The even surface of its prothorax and the not strongly transverse form of the same perhaps render its place in the genus a little doubtful, but I hesitate to separate it on these characters alone. *Momæa* has not been previously attributed to Australia; it occurs in New Guinea.

N. Queensland.

#### DIRCEMA.

It has been pointed out by Baron de Harold that *Galercula australis*, Bohem., is a member of this genus. It appears probable that this is a correct reference.

#### RUPILIA.

*R. excelsa*, sp. nov. Minus nitida; supra rufa, elytris (parte prope suturam rufa excepta) cyaneis; subtus rufa (segmentorum ventralium parte antica laterali cyanescenti excepta); pedibus (femorum basi rufa excepta) piceis; capite inter oculos inæquali, longitudinaliter linea fortiter impresso, parte mediana sat crasse punctulata; prothorace quam longiori fere duplo latiori, crebre fortiter subæqualiter punctulato, sulco lato transverso discoidali bene determinato profunde impresso (hoc margines laterales fere attingenti, sed ad medium paullo minus lato paullo minus profundo); scutello elytrisque confertim sat fortiter (fere subrugulose) punctulatis. Long.,  $3\frac{1}{2}$  l.; lat.,  $1\frac{4}{5}$  l.

Distinct from its previously described allies by the broad rufo-testaceous stripe forming the inner border of each elytron. Its nearest ally seems to be *R. ruficollis*, Clk., from which it differs *inter alia* by the strong subrugulose puncturation of its scutellum, as well as by the coloring of its elytra.

N. Queensland; taken by Mr. Koebele.

#### NEORUPILIA.

*N. ornata*, sp. nov. Oblongo-ovalis (mas) vel oblongo-ovata (fem.); minus robusta; sat nitida; nigra, antennarum basi genibus tibiis tarsis et elytrorum maculis binis (his in humero et prope apicem positis) testaceis; capite prothoraceque fere lævibus; hoc minus transverso, postice sat angustato; elytris subtiliter sparsius (minus distincte) punctulatis, maris quam abdomen paullo (feminæ sat multo) brevioribus, ad apicem dehiscens; antennis quam corpus (maris) sublongioribus vel (feminæ) sat brevioribus, articulis basalibus 3 testaceis, articulo basali modice elongato, 2° minus brevi, 3° quam 2<sup>ns</sup> paullo longiori, 4° quam 3<sup>ns</sup> paullo

longiori (quam 1<sup>us</sup>, et quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti, breviori).  
 Long.,  $\frac{4}{5}$  l.—1 l.; lat.,  $\frac{2}{10}$ — $\frac{2}{5}$  l.

The male of this minute *Galerucid* has a certain resemblance to a small *Tachys*. It is a very pretty and distinct species. In some specimens the pale marks on the elytra are almost white.

Victoria; Alpine region.

#### ADIMONIA.

Several Australian species seem to be referable to this genus, with which they agree in the following characters; front coxal cavities closed (their structure is as in the European *A. caprea*, Linn.); front coxæ contiguous or all but contiguous; metasternum not prominent between the middle coxæ; elytral epipleuræ continued well behind the middle of the length of the elytra; tibiæ unarmed; claws of the tarsi bifid; lateral borders of prothorax well defined; head considerably narrower than prothorax; third joint of antennæ distinctly longer than fourth joint; basal joint of hind tarsi about equal in length to the next two joints together; tibiæ more or less carinate on their external margin. The species that I refer to this genus agree well with it in facies and also resemble in facies *Dircema (Galeruca) australis*, Bohem. In the last-named species the apices of the epimera of the prosternum undoubtedly do not meet the base of the true prosternum but project freely; nevertheless I cannot satisfy myself that it is anything but an extremely close ally of these species which I refer to *Adimonia*. In *Galerucella McDonaldi*, Lea the front coxæ are closed and therefore that insect ought not to stand in *Galerucella*; I think it can hardly be separated generically from *Adimonia*.

*A. lugens*, sp. nov. Elongata; minus nitida; subtiliter pubescens; supra nigro-picea, capite postice antice et ad latera anguste testaceo, prothorace testaceo-variegato, elytris nonnullorum exemplorum in disco vix dilutioribus et utrinque prope scutellum linea brevi testacea ornatis; subtus obscure livida, piceo-variegata; antennis nigris, articulo basali subtus et 2<sup>i</sup> 3<sup>i</sup> que basi summa testaceis; pedibus piceis, femoribus testaceo-maculatis; antennis minus robustis quam corporis dimidium paullo longioribus, articulo 3<sup>o</sup> quam 4<sup>us</sup> vix longiori; capite longitudinaliter sat fortiter impresso, cum prothorace crebre aspere punctulato; hoc quam longiori duplo latiori, transverisim fortiter impresso, lateribus sat rotundatis; elytris confertim sat subtiliter vix aspere punctulatis. Long.,  $4\frac{1}{5}$  l.; lat.,  $2\frac{1}{5}$  l.

The elytra are almost uniformly pitchy black, when closely examined a small testaceous mark is observed on either side of the scutellum and in some specimens a faint indefinite tendency to

reddish on the disc. On the prothorax there is a large black spot at each angle and a still larger one occupying the disc but not quite reaching the base or front margin. The sulcus of the prothorax is of curved shape and is on the front half of the surface; the surface of the prothorax (the sulcus excepted) is even and the hind angles are rounded. This species, to a casual glance bears much resemblance to a very dark specimen of *D. (Galeruca) australis*, Bohem. Besides the distinctions involved in the above remarks it differs from *D. australis* by its longer and less robust antennæ, its closely punctulate head and prothorax, its closed front coxæ, &c. From *D. McDonaldi*, Lea (which has closed front coxæ and ought I think to be placed in *Adimonia*) it differs widely by its color, much larger size, much longer and less robust antennæ, more transverse prothorax of which the hind angles are rounded, &c., &c.

N. Queensland; taken by Mr. Cowley near Cairns.

*A. Mastersi*, sp. nov. Sat elongata; minus nitida; subtiliter pubescens; supra testaceo-brunnea; subtus, cum antennis pedibusque piceo-nigra; antennis modice robustis, quam corporis dimidium subbrevioribus, articulo 3° quam 4<sup>as</sup> sat longiori; capite inter antennis bituberculato, crebre nec grosse punctulato; prothorace quam longiori vix duplo latiori, inæquali (sc. utrinque spatio concavo magno leviter impresso, et antice spatio triangulâri leviter elevato—hoc in medio concavo—instructo), crebre (in spatio elevato triangulâri sparsim) punctulato, angulis anticis dentiformibus, lateribus mox ante basin ut dens parva productis; elytris sat crebre sat fortiter punctulatis, lineis nonnullis elevatis vix manifestis instructis. Long.,  $2\frac{1}{2}$  l.; lat.,  $1\frac{1}{5}$  l.

A very distinct little species; from its general facies and the form of its prothorax it should stand I think near *A. (Galerucella) McDonaldi*, Lea. It bears considerable general resemblance to the European *A. capreæ*, Linn., but *inter alia* its prothorax is much smaller in proportion to the elytra.

N.S. Wales; sent to me by Mr. Masters from the Richmond River District.

*A. richmondensis*, sp. nov. Modice elongata; minus nitida; subtiliter pubescens; testacea, elytris vitta lata discoidali viridi ornatis, antennis genibus tibiis tarsisque infuscatis; antennis sat robustis, quam corporis dimidium paullo longioribus, articulo 3° quam 4<sup>as</sup> sat longiori; capite confuse nec grosse ruguloso, longitudinaliter leviter impresso; prothorace quam longiori duplo latiori, ante medium late transversim leviter concavo, crebre subtilius (antice magis crasse) punctulato, lateribus sat rotundatis, angulis anticis sat acutis (vix

prominulis) posticis obtusis; elytris confertim subtilius punctulatis; unguiculis bifidis sed lobo interiori brevi.

Var. ? *maculatifrons* differt capite macula magna nigra ornata, elytrorum vittis in sutura conjunctis et versus latera minus extensis. Long.,  $3\frac{1}{2}$  l.; lat.,  $1\frac{3}{5}$  l.

I do not know of any previously described species resembling this in coloring. The var. ? *maculatifrons* does not seem to differ from the type except in respect of its markings and in the sculpture of its head scarcely rugulose.

N.S. Wales; sent to me by Mr. Masters from the Richmond River District; the var. ? is from Queensland.

#### SOLENIA.

*S. Cowleyi*, sp. nov. Late ovata; nitida; supra testacea, elytris cœruleis; subtus antice (capite prosternoque) testacea, postice (abdomine) picea, mesosterno et metasterno testaceis plus minusve infuscatis; antennis piceis (articulis basalibus 3 testaceis); pedibus testaceis, posticis cum tibiis tarsisque omnibus plus minusve picescentibus; capite lato lævi; antennis quam corporis dimidium sat longioribus, articulo 3° quam 2<sup>us</sup> sesquolongiori; prothorace convexo, quam longiori vix duplo latiori, vix manifeste punctulato, lateribus rotundatis, angulis anticis subdentiformibus, ad basin utrinque fovea impresso; elytris sat crebre minus subtiliter (puncturis in parte antica subseriatim dispositis, in parte postica sat obsolete) punctulatis. Long.,  $2\frac{1}{5}$ — $2\frac{4}{5}$  l.; lat.,  $1\frac{1}{5}$ — $1\frac{3}{5}$  l.

This genus has not, I believe, been previously reported as Australian. The above species is no doubt very near *S. Albertisi*, Jac., but differs from it in several characters—*e.g.*, its yellow scutellum and the well defined and comparatively strong puncturation of its elytra.

N. Queensland; taken by Mr. Cowley near Cairns.

#### MICRANTIPHA (gen. nov. *Galerucitarum*).

Caput convexum, inter oculos transversim sulcatum; palporum maxillarium articulus apicalis brevis conicus acuminatus; oculi sat parvi sat fortiter granulati; antennæ robustæ sat elongatæ (articulo basali sat elongato, 2° 3° que inter se sat æqualibus minus brevibus, 4° quam 3<sup>us</sup> parum longiori); prothorax transversus, mox ante basin transversim sulcatus; scutellum parvum; elytra oblonga; epipleuræ fere ad apicem continuæ; prosternum inter coxas continuum; metasternum sat elongatum, antice haud productum; coxæ anticæ clausæ; pedes sat robusti, tibiis sat cylindricis posticis breviter mucronatis; tarsi breves, articulo basali (? maris solum).

dilatato—posticorum articulo basali quam 2<sup>us</sup> vix longiori ; unguiculi appendiculati.

The minute insect for which I propose this name has much the appearance of a *Halticid*, but as its hind femora are not at all more dilated than than those of the other pairs of legs it must be placed among the *Galerucides*. It does not satisfactorily fall into any of Dr. Chapuis' "Groupes" of that sub-family, but its non-contiguous closed front coxæ together with its normal metasternum seem to associate it with the *Antiphites* from which however the presence of a small mucro at the extremity of the hind tibiæ (I cannot detect any mucro on the other tibiæ) seems to separate it. On the whole it has something of the facies of *Solenia* in miniature and therefore I think will not be far out of place if treated as an aberrant member of the *Antiphites*, but it is certainly a very puzzling form.

*M. paradoxa*, sp. nov. Oblongo-ovalis ; sat nitida ; setis gracilibus albis erectis sparsim vestita ; brunneo-testacea vel brunnea, antennis apicem versus et abdomine magis obscuris ; capite vix perspicue, prothorace sparsim fortius, punctulatis ; elytris vix striatis, striis sat fortiter nec crebre punctulatis. Long.,  $\frac{3}{5}$ — $\frac{4}{5}$  l. ; lat.,  $\frac{1}{4}$ — $\frac{3}{10}$  l.

One of my examples is smaller and considerably darker in color than the others, with antennæ a little longer (about as long as three-quarters of the body). I take its differences to be sexual, but it may possibly represent a distinct species.

S. Australia ; Eyre's Peninsula.

#### CANDEZEA.

*C. sculpta*, Blackb. When I described this species (P. L. S., N.S.W. 1890, p. 363) I mentioned its very close alliance with *C. bimaculata*, Jac. and stated that I should have hesitated to consider it distinct except on the ground that *bimaculata* was said to have elytra scarcely visibly punctured. I have since obtained a specimen from New Guinea (the habitat of *C. bimaculata*) evidently conspecific with my *C. sculpta* and therefore—although I certainly cannot regard the elytra as "scarcely visibly punctured," I think there cannot be much doubt that the two names apply to the same insect and that *sculpta* must be treated as a synonym of *bimaculata*.

#### MENIPPUS.

Through the liberality of Mr. Masters I have recently acquired an authentic specimen of *M. cynicus*, Clk. (the typical species of this genus). It seems to have been an oversight that M. Lacordaire placed it in the Groupe *Galerucites* as its metasternum is strongly produced between the middle coxæ—a character that

refers it to M. Lacordaire's Groupe *Hylaspites*. Had I been able to examine a type previously, or had this character been recorded by the author of the genus or by M. Lacordaire, I should not have referred to *Menippus* the species which I have so referred, and I now regret to find that they cannot stand as congeneric with *M. cynicus*. They are three in number. The first of them (*M. maculicollis*) is I now believe a var. of *Dircema* (*Galeruca*) *australis*, Bohem, while the other two (*M. elegans* and *4-notatus*) may be referred to *Adimonia*, although *M. elegans* is by no means a typical *Adimonia* (approaching *Buphonida* in its head being scarcely narrower than its prothorax but differing from *Buphonida* even more than from *Adimonia* in its claws being scarcely bifid, almost simple).

#### MONOLEPTA.

There is no genus of the *Galerucides* more difficult to characterise definitely than this. Mr. Baly (Journ. Linn. Soc. XX.) states that it varies in respect of the closure of the front coxæ and in the length of the elytral epipleuræ, while Dr. Chapuis says that some of its species (having their front coxæ open) ought not to remain in it and Mr. Jacoby tells us that those with elongate elytral epipleuræ (in spite of Mr. Baly's statement that the type of the genus is one of these) ought to be removed. Among the numerous species (attributed to the genus) before me I find considerable variation in the elytral epipleuræ, but I have not seen any in which I can find that the front coxæ are open. These discrepancies of diagnosis occasion me considerable difficulty in respect of several new species before me, especially in view of the fact (referred to above) that Dr. Chapuis and Mr. Baly do not seem to mean quite the same by "open" or "closed" front coxæ. It seems best, under the circumstances to define the characters which in this memoir I regard as those of *Monolepta*, viz., front coxæ closed in the sense that the apex of the prosteral epimera is not (as it is in *e.g.*, *Luperus*) a free projection laid against the surface of the coxa, elytral epipleuræ failing (or at least only very obscurely traceable) behind the middle of the elytra, tibiæ mucronate; basal joint of hind tarsi at least as long as the following joints together, claws appendiculate.

It is extremely difficult, in my experience, to draw a sharp line of distinction between the Groupes *Monoleptites* and *Luperites*. In some of the species that I have attributed to *Monolepta* (*M. modesta*, *quæsita*, and *Benallæ* particularly) the closure of the front coxæ is excessively fine and it is possible that they are examples of what Dr. Baly considers species with the coxæ not quite closed but nevertheless attributable to *Monolepta*. All



their tibiæ being mucronate and their elytral epipleuræ obsolete behind the middle I do not see how they can be placed in *Luperus* and the basal joint of their hind tarsi is too short for *Luperodes*, so for the present at any rate they must remain in *Monolepta*.

*M. dilutior*, sp. nov. Elongato-ovalis; sat nitida; pallide testacea, antennis apicem versus infuscatis, elytris apicem versus plus minusve obscuris; antennis gracilibus quam corpus parum brevioribus, articulo basali sat elongato arcuato, 2° 3° que brevibus (hoc quam ille graciliori), 4° sat elongato (quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti vix longiori, quam 1<sup>us</sup> subbreviori); capite sublævi, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori duabus partibus latiori, subquadrato, sat fortiter vix crebre punctulato, transversim late minus profunde in medio impresso; elytris fere ut prothorax punctulatis; tarsorum posteriorum articulo basali quam ceteri conjuncti fere duplo longiori. Long.,  $1\frac{1}{2}$  l.; lat.,  $\frac{4}{5}$  l.

Var. elytris totis testaceis.

This little species has a more slender and fragile appearance than most *Monoleptæ* and has much the facies of a *Halticid*; the tarsi of its hind legs are nearly as long as their tibiæ. The elytral epipleuræ are broad near the base and rapidly become extremely narrow before the middle of their length, but are just traceable for an appreciable distance behind the middle. The dark blotch near the apex of the elytra looks as though it were caused by the elytra being sprinkled with a fine smoky dust, and is never very conspicuous.

N. Queensland; taken by Mr. Koebele near Cairns.

*M. implicata*, sp. nov. Elongato-ovalis; sat nitida; testacea, antennis apicem versus infuscatis, capite prothorace elytris que lineis maculisque piceis numerosis ornatis; antennis gracilibus quam corpus vix brevioribus, articulo basali sat elongato arcuato, 2° brevi, 3° quam 2<sup>us</sup> graciliori et dimidia parte longiori, 4° sat elongato quam præcedentes 2 conjuncti vix (quam 1<sup>us</sup> sat manifeste) breviori; capite sublævi, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori duabus partibus latiori, fortiter vix crebre punctulato, transversim obsolete impresso, lateribus modice arcuatis; elytris ut prothorax punctulatis; tarsorum posteriorum articulo basali quam ceteri conjuncti fere duplo longiori. Long.,  $1\frac{1}{2}$  l.; lat.,  $\frac{4}{5}$  l.

This species is closely allied to the preceding, though at once distinguishable from it by the markings on its upper surface (also by the more rounded sides of its prothorax, &c.). The piceous markings are a little variable. In an ordinary example

they consist of a longitudinal median line on the head ; a patch resembling the letter M on the prothorax and also the extreme lateral margins of the same ; and on each elytron a spot near the apex of the scutellum, a short longitudinal line between the spot and the shoulder, a bisinuate longitudinal line from the shoulder nearly to the middle of the elytron, a transverse zigzag line touching neither suture nor lateral margin slightly in front of the middle of the elytron, and two spots near the apex. In some examples these markings are larger and more numerous as well as nearly black in color. In one example (which the discovery of more specimens may possibly prove to be a distinct species as the prothorax seems more feebly punctulate and its transverse impression is scarcely traceable) the markings are black and those on the elytra present the appearance of three coarse vittæ (the inner two vittæ three or four times interrupted, the external one interrupted only near the base, all of them dilated here and there so as to coalesce in places) and the prothoracic discal markings consist of black lines touching the apex but not the base. I think this form might be called "var *extrema*" as I have not seen any specimen really intermediate between it and the type ; nevertheless I think its markings are only an extreme development of those of the type.

N. Queensland ; taken by Mr. Koebele near Cairns.

*M. fumaticornis*, sp. nov. Sat late ovalis ; sat nitida ; testacea, antennis nigris ; antennis minus gracilibus, quam corporis dimidium sat longioribus, articulo basali modice elongato, 2° 3° que brevibus inter se sat æqualibus, 4° elongato (quam præcedentes 2, et quam 1<sup>us</sup> sublongiori) ; capite sublævi, inter oculos transversim arcuatim profunde sulcato ; prothorace quam longiori dimidia parte latiori, sat crebre sat subtiliter punctulato, transversim sat fortiter impresso ; elytris crebre subfortiter punctulatis ; epipleuris paullo ultra medium sat distinctis ; tarsorum posticorum articulo basali quam ceteri conjuncti sesquilongiori. Long.,  $2\frac{1}{3}$  l. ; lat.,  $1\frac{1}{3}$  l.

Very distinct by its color, uniformly pale testaceous, except the antennæ which are entirely deep black.

Thursday Island ; taken by Captain E. Bourke, R.N.

*M. sparsipennis*, sp. nov. Sat late ovalis ; nitida ; flavo-testacea, antennis (articulis basalibus 3 exceptis) et elytrorum maculis singulis parvis basalibus, nigris ; antennis sat robustis, quam corpus sat brevioribus, articulo basali modice elongato, 2° minus brevi, 3° quam 2<sup>us</sup> paullo longiori, 4° quam 1<sup>us</sup> (et quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti) vix longiori ; capite inter oculos transversim profunde arcuatim sulcato, parte postica

cum prothorace minus crebre sat subtiliter punctulata; hoc quam longiori fere duplo latiori, transversim obsolete impresso; elytris minus crebre minus fortiter punctulatis, epipleuris pone medium obsolete; tarsorum posticorum articulo basali quam ceteri conjuncti fere duplo longiori. Long.,  $2\frac{1}{3}$  l.; lat.,  $1\frac{2}{3}$  l.

A very nitid species and easily recognisable from all known to me by its color and markings; it is of a bright testaceous color, with the antennæ black (except the basal three joints) and a small black spot on either side of the scutellum. In the unique type the suture bears a small infuscate blotch a little in front of the middle, but as this mark is on one elytron only I suspect it is accidental.

N. Queensland; taken by Mr. Cowley near Cairns.

*M. elytrura*, sp. nov. Sat late ovalis; nitida; testacea, antennarum articulo apicali piceo, elytris rufo-piceis latera versus dilutioribus; antennis modice gracilibus, quam corporis dimidium sat longioribus, articulo basali sat elongato, 2° brevi, 3° quam 2<sup>us</sup> sat longiori, 4° quam 1<sup>us</sup> vix breviori (quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti vix longiori; capite inter oculos transversim profunde arcuatim sulcato, vix manifeste punctulato; prothorace quam longiori duplo latiori, sat æquali, crebrius sat subtiliter punctulato; elytris minus confertim minus subtiliter punctulatis; epipleuris pone medium obsolete; tarsorum posticorum articulo basali quam ceteri conjuncti duplo longiori. Long.,  $2\frac{1}{3}$  l.; lat.,  $1\frac{1}{3}$  l.

Entirely testaceous except the apical joint of the antennæ which is blackish, and the elytra which are reddish piceous become more rufo-testaceous about the lateral and apical margins.

N. Queensland; taken by Mr. Cowley near Cairns.

*M. brevior*, sp. nov. Subovata; nitida; brunneo-testacea, antennis (articulis basalibus 3 vel 4 exceptis) piceis, corpore subtus rufo-piceo abdomine excepto (hoc testaceo latera versus piceo); antennis gracilibus quam corpus paullo brevioribus, articulo basali sat elongato, 2° brevi, 3° quam 2<sup>us</sup> graciliori dimidia parte longiori, 4° quam 1<sup>us</sup> vix breviori (2° 3° que conjunctis longitudine sat æquali); capite sublævi, inter oculos transverse profunde arcuatim sulcato; prothorace quam longiori dimidia parte latiori, sat æquali, fortiter (fere rugulose) punctulato; elytris sat fortiter sat crebre punctulatis; epipleuris ultra medium indistincte continuis; tarsorum posticorum articulo basali quam ceteri conjuncti paullo longiori. Long.,  $1\frac{1}{3}$  l.; lat.,  $\frac{3}{5}$  l.

The distinctly ovate form of this little species (its greatest width being behind the middle of the elytra) is characteristic. In

some respects it resembles *M. dilutior* structurally, but the comparatively much shorter basal joint of its hind tarsi forbids its being regarded as a very close ally.

N. Queensland; taken by Mr. Koebele.

*M. cognata*, sp. nov. Ovalis; modice elongata; nitida; testacea, antennis (basi excepta) leviter infuscatis; his sat robustis, quam corporis dimidium paullo longioribus, articulo basali modice elongato, 2° brevi, 3° quam 2<sup>us</sup> manifeste longiori, 4° sat elongato quam 1<sup>us</sup> (et quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti) sublongiori; capite subtiliter punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori dimidia parte latiori, transversim leviter impresso, subtilius punctulato; elytris subtiliter crebrius punctulatis; epipleuris paullo ultra medium continuis; tarsorum posticorum articulo basali quam ceteri conjuncti paullo longiori. Long., 2 l.; lat., 1 $\frac{1}{5}$  l.

This species bears much resemblance to *M. fumaticornis*, but is smaller, with the antennæ (the basal joint excepted) slightly infuscate and the elytra much more finely punctulate.

N. Queensland; taken by Mr. Koebele.

*M. biguttigera*, sp. nov. Elongato-ovalis; sat nitida; testacea, antennis (articulis basalibus 3 exceptis) infuscatis, elytris maculis nigris binis (sc. altera rotundata basali, altera elongata prope apicem oblique posita) ornatis; antennis modice robustis, quam corporis dimidium sat longioribus, articulo basali modice elongato, 2° brevi, 3° quam 2<sup>us</sup> sat longiori, 4° quam 1<sup>us</sup> (et quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti) vix longiori; capite vix manifeste punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori dimidia parte latiori, transversim minus fortiter impresso, sat crebre minus subtiliter punctulato; elytris fere ut prothorax punctulatis; epipleuris paullo ultra medium continuis; tarsorum posticorum articulo basali quam ceteri conjuncti paullo longiori. Long., 2 l.; lat., 1 l.

A very distinct species on account of the markings on its elytra, consisting of (on each elytron) a small roundish black spot on the base nearer the lateral margin than the suture and an elongate black spot placed obliquely near the apex (this also nearer the lateral margin than the suture).

N.W. Australia; sent to me by Mr. Masters.

*M. variegata*, sp. nov. Elongato-ovalis; sat nitida; testacea, antennis (articulis basalibus 3 exceptis) piceis, elytris plagis nigris (sc. macula lunata basali, macula mediana transversa, maculis 2 subapicalibus oblique positis, et margine apicali) ornatis, metasterno tarsisque infuscatis; antennis ut præced

entis; capite inter oculos distincte minus subtiliter punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori fere duplo latiori, transversim impresso, vix crebre minus subtiliter punctulato; elytris quam prothorax paullo magis crebre punctulatis; epipleuris vix ultra medium distincte continuis; tarsorum posteriorum articulo basali quam ceteri conjuncti paullo longiori. Long.,  $1\frac{4}{5}$  l.; lat.,  $\frac{9}{10}$  l.

Structurally very near the preceding from which it differs widely in respect of its color and markings—also in several other respects, especially in the much more distinct puncturation of its head.

N.W. Australia; sent to me by Mr. Masters.

*M. subsuturalis*, sp. nov. Elongata; sat nitida; supra pallide brunneo-testacea, prothorace (nonnullorum exemplorum) indeterminate nigro-adumbrato, scutello nigro, elytrorum sutura angustissime nigra, antennis (articulis basalibus 3 fuscis exceptis) nigris; subtus nigra, pedibus testaceis (tarsis subinfuscatis); antennis (maris) quam corpus haud brevioribus sat robustis, (feminae) brevioribus gracilioribus, articulo basali modice elongato, 2° brevi, 3° quam 2<sup>us</sup> parum longiori, 4° modice elongato (1° et 2° 3° que conjunctis longitudine sat aequali); capite sat distincte punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori fere duplo latiori, transversim impresso, leviter minus distincte punctulato; elytris sat crebre subfortiter punctulatis; epipleuris pone medium obsoletis; tarsorum posteriorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{1}{4}$  l.; lat.,  $\frac{1}{2}$  l.

This little species bears considerable resemblance to that which I take to be *suturalis*, Boisd., but differs from it *inter alia* by its black undersurface.

Victoria.

*M. eyrensis*, sp. nov. Præcedenti (*M. subsuturali*) valde affinis; differt antennis totis brunneo-testaceis, prothorace distincte punctulato, oculis magis grosse granulatis, elytrorum sutura leviter infuscata nec nigra. Long.,  $1\frac{2}{5}$  l.; lat.,  $\frac{2}{5}$  l.

Very close to the preceding, but certainly distinct on account of the much coarser granulation of its eyes.

S. Australia; Eyre's Peninsula.

*M. tricolor*, sp. nov. Elongato-ovalis; sat nitida; testacea, capite prothoraceque rufis, antennis (articulis basalibus 4 exceptis) et elytrorum sutura (hac sat late) nigris, tarsis plus minusve infuscatis; antennis quam corpus sat brevioribus, articulo basali modice elongato, 2° minus brevi, 3° quam

2<sup>us</sup> parum longiori, 4<sup>o</sup> minus elongato (quam 1<sup>us</sup>, et quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti, paullo breviori); capite sat fortiter punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori dimidia parte latiori, transversim vix impresso, sat crebre sat fortiter subrugulose punctulato; elytris sat crebre sat fortiter nec rugulose punctulatis; epipleuris paullo ultra medium sat distinctis; tarsorum posticorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{4}{5}$  l.; lat.,  $\frac{4}{5}$  l.

This species bears much superficial resemblance to *M. Froggatti*, Blackb., but, besides color differences, is very distinct from it *inter alia* by its strongly punctulate head and prothorax.

Victoria.

*M. sordidula*, sp. nov. Ovalis; sat nitida; sordide testacea, antennis (articulis basalibus 3 exceptis) infuscatis; his sat gracilibus, quam corpus sat brevioribus, articulo basali modice elongato, 2<sup>o</sup> brevi, 3<sup>o</sup> quam 2<sup>us</sup> sat longiori, 4<sup>o</sup> minus elongato (quam 1<sup>us</sup> et quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti subbreviori); capite subtilissime punctulato, inter oculos transversim sulcato et sub-bituberculato; prothorace quam longiori dimidia parte latiori, transversim vix manifeste impresso, distincte sat crebre punctulato; elytris crebre subfortiter punctulatis; epipleuris vix ad medium distinctis; tarsorum posticorum articulo basali ceteris conjunctis longitudine æquali. Long.,  $1\frac{2}{3}$  l.; lat.,  $\frac{4}{5}$  l (vix).

Resembles *M. inconspicua*, Blackb. from which however it differs *inter alia* by the puncturation of its prothorax.

Victoria; on the Black Spur and in other localities.

*M. interincta*, sp. nov. Elongato-ovalis; sat nitida; testacea, antennis (articulis basalibus 5 exceptis) nigricantibus, sutura (hac peranguste) corporeque subtus nigris; antennis modice robustis, quam corporis dimidium sat longioribus, articulo basali modice elongato, 2<sup>o</sup> brevi, 3<sup>o</sup> quam 2<sup>us</sup> manifeste longiori, 4<sup>o</sup> sat elongato (1<sup>o</sup>, et 2<sup>o</sup> 3<sup>o</sup> que conjunctis, longitudine sat æquali); capite distincte punctulato, inter oculos transversim profunde arcuatim sulcato (exempti typici in fronte transversim 3-foveolato); prothorace quam longiori fere duplo latiori, transversim fortiter impresso, sublævi; elytris subfortiter sat crebre punctulatis; epipleuris vix ultra medium distinctis; tarsorum posticorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{2}{3}$  l.; lat.,  $\frac{2}{3}$  l.

Much resembles *M. subsuturalis* (of which it is possibly a well-marked local form) but differs from that species in its considerably larger size, in the basal five joints of its antennæ testaceous, its less infuscate tarsi, &c.

Victoria.

*M. melancholica*, sp. nov. Ovalis, minus elongata; sat nitida; piceo-nigra, capite prothorace que obscure rubrescentibus, pedibus piceo-testaceis (tarsis obscurioribus); antennis minus robustis, quam corpus parum brevioribus, articulo basali modice elongato, 2° brevi, 3° quam 2<sup>us</sup> paullo longiori, 4° modice elongato (1° et 2° 3° que conjunctis, longitudine sat æquali); capite minus perspicue punctulato, inter oculos transversim profunde arcuatim sulcato et distincte bituberculato; prothorace quam longiori duplo latiori, transversim vix perspicue impresso, leviter punctulato; elytris subtiliter minus perspicue punctulatis; epipleuris paullo ultra medium sat distinctis; tarsorum posticorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{1}{3}$  l.; lat.,  $\frac{2}{5}$  l.

Easily recognisable by its small size, dark color, and the fine inconspicuous puncturation of its very nitid elytra.

Victoria; Alpine region.

*M. ordinaria*, sp. nov. Ovalis, modice elongata; sat nitida; nigra, capite prothorace que flavo-testaceis, antennarum tibiærumque basi plus minusve rufescentibus; antennis sat robustis, quam corporis dimidium multo (maris) vel vix multo (feminæ) longioribus, articulo basali modice elongato, 2° sat brevi, 3° quam 2<sup>us</sup> (maris manifeste, feminæ vix) longiori, 4° longitudine 1° sat æquali (quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti subbreviori); capite obsolete punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori dimidia parte latiori, transversim vix manifeste impresso, subtilissime sparsius punctulato; elytris subtiliter minus perspicue punctulatis; epipleuris pone medium obsoletis; tarsorum posticorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{4}{5}$  l.; lat.,  $\frac{9}{10}$  l.

N.S.W.; on the Blue Mountains.

*M. pictifrons*, sp. nov. Elongato-ovalis, subparallela; sat nitida; nigra, capite supra (fronte summa labroque nigris exceptis) prothorace supra antennarum basi pedibusque testaceis; antennis quam corporis dimidium multo longioribus, articulo basali modice elongato, 2° brevi, 3° quam 2<sup>us</sup> manifeste longiori, 4° modice elongato (quam 1<sup>us</sup> vix longiori, quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti subbreviori); capite vix perspicue punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori fere duplo latiori, transversim manifeste impresso, sat distincte punctulato; elytris crebre fortius (fere subrugulose) punctulatis; epipleuris pone medium obsoletis; tarsorum posticorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{2}{5}$  l.; lat.,  $\frac{1}{2}$  l.

Easily distinguishable by the coloring of its face,—the labrum

and the part behind the transverse sulcus being black while the intermediate portion is yellow. Its nearest previously described ally seems to be *M. modesta*, Blackb.

Victoria.

*M. piticollis*, sp. nov. Ovalis, modice elongata; sat nitida; testacea, macula frontali maculis in prothorace 2 magnis et elytris (macula magna communi testacea excepta) fuscis vel nigro-fuscis, antennis (basi excepta) plus minusve infuscatis; his quam corpus paullo brevioribus modice robustis, articulo basali modico, 2° brevi, 3° quam 2<sup>us</sup> sat longiori, 4° modico (1°, et 2° 3° que conjunctis, longitudine sat æquali); capite vix perspicue punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori plus quam dimidia parte latiori, transversim vix impresso, subtiliter minus perspicue punctulato: elytris leviter minus perspicue punctulatis; epipleuris pone medium obsoletis; tarsorum posticorum articulo basali quam ceteri conjuncti manifeste longiori. Long., 2 l.; lat., 1 l. (vix).

Readily recognisable by the dark blotch on the middle of the forehead together with another somewhat similar (but larger) on either side of the median line of the prothorax and close to its front margin. The common testaceous area on the elytra seems variable in size and shape,—in some examples being nearly a parallelogram and occupying the larger portion of the elytra, in other examples being considerably smaller and having its shape modified by the dark basal and apical coloring being more or less prolonged along the suture (I have not seen any example in which the suture is wholly dark so as to divide the testaceous spot).

Victoria.

*M. debilis*, sp. nov. Ovalis, minus elongata; nitida; sordide rufo-testacea, antennis (articulis basalibus 4 exceptis) tibiis tarsis pectoreque infuscatis, abdomine fere nigro; antennis minus robustis quam corporis dimidium paullo longioribus, articulo basali sat elongato, 2° brevi, 3° quam 2<sup>us</sup> sesquolongiori, 4° sat elongato (1°, et 2° 3° que conjunctis, longitudine sat æquali); capite fere lævi, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori duplo latiori, transversim vix perspicue impresso, sparsius sat subtiliter punctulato; elytris subtiliter sat sparsim (quam prothorax paullo magis subtiliter magis sparsim) punctulatis; epipleuris pone medium obsoletis; tarsorum posticorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{3}{5}$  l.; lat.,  $\frac{4}{5}$  l.

A species of inconspicuous appearance, differently colored from



its allies, and with the puncturation of its elytra unusually fine and sparse.

Victoria.

*M. albotincta*, sp. nov. Ovalis, minus elongata; nitida; nigropicea, tibiis tarsisque dilutioribus, elytrorum lateribus albidis; antennis quam corporis dimidium paullo longioribus, minus robustis, articulo basali sat elongato, 2<sup>o</sup> brevi, 3<sup>o</sup> quam 2<sup>ns</sup> sesquolongiori, 4<sup>o</sup> sat elongato (1<sup>o</sup>, et 2<sup>o</sup> 3<sup>o</sup> que conjunctis, longitudine sat æquali); capite vix perspicue punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori duplo latiori, transversim vix impresso, fortius sat crebre punctulato; elytris ut prothorax punctulatis; epipleuris pone medium obsoletis; tarsorum posticorum articulo basali quam ceteri conjuncti vix longiori. Long.,  $1\frac{2}{5}$  l.; lat.,  $\frac{4}{5}$  l. (vix).

Apart from other characters the coloring of this species is so distinctive that it is impossible to confuse it with any of its described allies.

Victoria.

*M. (?) tarsalis*, sp. nov. Oblongo-ovalis; sat nitida; supra sordide testacea hic illic indeterminate infuscata, antennis nigris, pectore abdomineque nigris, pedibus testaceis; antennis robustis, quam corpus paullo brevioribus, articulo basali minus elongato, 2<sup>o</sup> sat brevi, 3<sup>o</sup> quam 2<sup>us</sup> parum longiori, 4<sup>o</sup> sat elongato (quam 1<sup>us</sup> et quam 2<sup>us</sup> 3<sup>us</sup> que conjuncti sublongiori); capite sat magno (quam prothorax haud multo angustiori), distincte punctulato, inter oculos transversim profunde arcuatim sulcato; prothorace quam longiori dimidia parte latiori, transversim obsolete impresso; subtiliter sat crebre punctulato; elytris crebre subtilius (quam prothorax paullo minus subtiliter) punctulatis; epipleuris pone medium obsoletis; tarsorum posticorum articulo basali (? maris solum) valde dilatato, quam ceteri conjuncti subbreviori. Long.,  $2\frac{1}{3}$  l.; lat.,  $\frac{4}{5}$  l.

I feel much hesitation in attributing this species to *Monolepta* on account of the remarkable dilatation of the basal joint of its hind tarsi, and also on account of that joint being not quite so long as the three following joints together. I cannot, however, find that any other genus has been characterised to which this insect might be referred, and the tarsal character does not seem sufficient to justify the formation of a new genus.

S. Australia; near Quorn.

*M. croceicollis*, Germ. I have not seen any *Galerucid* agreeing with the description of this species, but it does not seem at all likely to be a true *Monolepta* as its author states that the third joint of its antennæ is as long as the fourth.

The described Australian species of *Monolepta* are now so numerous that it seems desirable to attempt a tabular statement of their characters. In the following table I have been obliged to rely more upon distinctions of color and markings than I altogether like doing, but this is due to the fact that a good many species probably attributable to *Monolepta* were described by the earlier authors in terms which gave no information regarding them except in respect of their colors and markings and it seems desirable to include these in a tabular arrangement although there are only two or three of them that I have been able to identify as among the species before me. I do not think that this is a very important matter, however, as I find that few species of *Monolepta* vary too much to be confidently separated by such broad distinctions of color and marking as I have made use of.

- A. Elytra with sharply defined markings.
- B. The elytral markings transverse.
- C. Base and apex of elytra not concolorous.
- D. Elytra red in front, dark behind.
- E. Abdomen fulvous ... .. *dimidiata*, Jac.
- EE. Abdomen black ... .. *divisa*, Blackb.
- DD. Elytra dark in front, red behind ... .. *hemorrhoidalis*, Fab.
- CC. Base (at least in its scutellar region) and apex of elytra concolorous.
- D. The base and apex entirely black.
- E. An entire median pale fascia ... .. *fasciatipennis*, Blackb.
- EE. The pale fascia not reaching the lateral margins ... .. *picticollis*, Blackb.
- DD. Base black around the scutellum, red laterally; apex black.
- E. The basal red of the elytra is an isolated spot ... .. *angulata*, Blackb.
- EE. The basal red of the elytra is widely connected with the median red portion ... .. *alpina*, Blackb.
- BB. The elytral markings longitudinal.
- C. The marking consists in the suture being black.
- D. Puncturation of prothorax indistinct or at least very feebly impressed.
- E. Underside black.
- F. Species of normal form.
- G. Hinder part of head black ... .. *Froggatti*, Blackb.
- GG. Head entirely testaceous ... .. *intertincta*, Blackb.
- FF. Form very narrow and subparallel
- EE. Underside testaceous ... .. *subsuturalis*, Blackb.
- EE. Underside testaceous ... .. *suturalis*, Boisd.
- DD. Prothorax very strongly and conspicuously punctured ... .. *tricolor*, Blackb.
- CC. The markings consist of a discal dark vitta on each elytron ... .. *Tepperi*, Blackb.
- CCC. The markings consist of a whitish marginal vitta on each elytron ... .. *albotincta*, Blackb.
- BBB. The elytral markings consist of isolated spots.

- C. Apex of elytra black.
- D. Elytra pallid, with a basal and apical spot black ... .. *quadrimaculata*, Jac.
- DD. Elytra black, with a pale humeral spot ... .. *humeralis*, Fab.
- DDD. Three or four large isolated dark spots on each elytron ... .. *variegata*, Blackb.
- CC. Apex of elytra pallid.
- D. Underside testaceous.
- E. Two black spots on each elytron (Form elongate)... .. *biguttigera*, Blackb.
- EE. One black spot (basal) on each elytron (Form normal) .. .. *sparsipennis*, Blackb.
- DD. Underside black ... .. *quadripunctata*, Fab.
- BBBB. Elytral markings different from the preceding.
- C. Elytra pallid, with a number of fine zigzag dark lines ... .. *implicata*, Blackb.
- CC. Elytra testaceous, with a rose-colored basal patch and subapical spot ... .. *rosea*, Blackb.
- AA. Elytra without sharply defined markings.
- B. Elytra dark (*i.e.*, green blue or blackish).
- C. Head black.
- D. Prothorax testaceous or red.
- E. Antennæ entirely black ... .. *nigricornis*, Blackb.
- EE. Base of antennæ testaceous.
- F. Size small (length less than 2 l.), surface nitid ... .. *modestus*, Blackb.
- FF. Size larger (length more than 2 l.), surface subopaque ... .. *Meyricki*, Blackb.
- DD. Prothorax black or bluish.
- E. Apical joints of antennæ fulvous ... .. *Germari*, Jac.
- EE. Apical joints of antennæ dark ... .. *quæsitæ*, Blackb.
- CC. Head partly testaceous.
- D. Legs testaceous.
- E. Size small (length about  $1\frac{1}{2}$  l.) (Form narrow) ... .. *pictifrons*, Blackb.
- EE. Size larger (length more than 2 l.) (Form normal) ... .. *occidentalis*, Blackb.
- DD. Legs black ... .. *Benallæ*, Blackb.
- CCC. Head entirely rufous or testaceous.
- D. Scutellum dark.
- E. Size very small (length less than  $1\frac{1}{2}$  l.), elytra dark piceous ... .. *melancholica*, Blackb.
- EE. Size larger (length about 2 l.), elytra deep black ... .. *ordinaria*, Blackb.
- DD. Scutellum yellow ... .. *lebiaformis*, Boisid.
- BB. Elytra testaceous, or reddish, or brownish-testaceous.
- C. Basal joint of hind tarsi less than half again as long as the rest together.
1. Basal joint of hind tarsi of normal form.
- E. Upper surface more or less mottled or clouded with a darker tone of color.
- F. Elytra considerably more closely and conspicuously punctured than disc of prothorax.

- G. Form very elongate. Elytral puncturation (for a *Monolepta*) very strong ... .. *eyrensis*, Blackb.
- GG. Form normal. Elytral puncturation considerably less strong.
- H. Antennæ (at least of one sex) long robust and (except basal three joints) black ... .. *simulatrix*, Blackb.
- HH. Neither sex with antennæ as H. ... .. *inconspicua*, Blackb.
- FF. Puncturation of prothorax and elytra uniform or nearly so.
- G. This puncturation (for a *Monolepta*) very strong ... .. *sordidula*, Blackb.
- GG. This puncturation very feeble ... .. *debilis*, Blackb.
- EE. Upper surface uniformly bright testaceous, without infuscation ... .. *cognata*, Blackb.
- DD. Basal joint of hind tarsi (at least in one sex) strongly dilated... .. *tarsalis*, Blackb.
- CC. Basal joint of hind tarsi at least half again as long as the rest together.
- D. Antennæ more or less testaceous.
- E. Transverse discal impression of prothorax obsolete.
- F. Antennæ (except piceous apical joint) wholly testaceous ... .. *elytrura*, Blackb.
- FF. Antennæ (except at base) infuscate ... .. *brevior*, Blackb.
- EE. Transverse discal impression of prothorax well defined ... .. *dilutior*, Blackb.
- DD. Antennæ entirely deep black ... .. *funaticornis*, Blackb.

## CASSIDIDES.

## CHIRIDA.

This genus was founded by Dr. Chapuis (Gen. Col. xi. 405) for certain species attributed by Boheman to *Coptocyela* and which differ from *Coptocyela* in their claws being appendiculate instead of simple. Dr. Chapuis says that owing to the slight regard Boheman paid to the structure of the claws in his descriptions of *Cassididæ* it is impossible to specify accurately which of his *Coptocyelæ* should enter this new genus; the only species he (Dr. Chapuis) can answer for as members of *Chirida* are two from S. America. The following species from tropical Queensland agree sufficiently with Dr. Chapuis' diagnosis to be at any rate provisionally placed in *Chirida*, although it is quite possible that if they could be compared with the American species on which the genus was founded it might appear necessary to found another distinct genus for these Australian forms. It may be noted that one of the species described below is so near (judging by the description) to *Coptocyela Holmgreni*, Bohem. that although Boheman does not describe the claws of that insect it is almost

sure to be congeneric with the species before me, from which it seems a probable conclusion further that all the other Australian *Cassidides* described by Boheman as congeneric with *Holmgreni* must be eliminated from *Coptocyclus*. The following characters in combination distinguish these insects from all the other known Australian *Cassidides*:—Head entirely hidden under the front of the prothorax; claws appendiculate, the basal piece not being pectinate; prothorax much narrower than the elytra. The two species described below differ *inter se* so much in size and facies as well as in some structural characters that they might well be treated as generically distinct from each other, but in view of the large number of Australian *Cassidides* still remaining undescribed it is better I think for the present to be content with describing *species* and grouping them in genera by a few well-marked characters, as generic classification should be based if possible on plentiful supplies of material. The characters I have mentioned above associate these two together and distinguish them from all other genera that have been attributed to Australia.

*C. multicolor*, sp. nov. Subrotundata; nitida; valde convexa; pallide testacea; supra (marginibus explanatis exceptis) nigro-picea, rufo-ferrugineo-variegata; antennis fere ad coxas posticas attingentibus, subfiliformibus, articulis 3<sup>o</sup>—5<sup>o</sup> inter se sat æqualibus (quam 1<sup>us</sup> gracilioribus paullo brevioribus, quam 2<sup>us</sup> gracilioribus sat longioribus); prothorace transverso, fere æqualiter elliptico, fere lævi; elytris leviter interrupte striatis, striis grosse punctulatis, antice retusis, pone scutellum vix distincte gibbis, humeris callosis; tarsorum articulo apicali ultra præcedentem vix excedenti; corpore subtus fere lævi. Long., 3 l.; lat., 2½ l.

The markings of the convex discal portion of the upper surface are as follows:—On the prothorax this portion is ferruginous with a short broad blackish vitta running forward a short distance from the base and dilating at its front; on the elytra the discal part is blackish with the following parts ferruginous—the scutellum and a spot on either side of it, on each elytron a little behind the scutellum a V-shaped mark having its apex on the suture, on each elytron behind the middle a subsutural spot, also the lateral and apical edges of the discal part (this edging being dilated inward about the middle and near the apex). The ferruginous parts are slightly raised and are probably metallic when the insect is alive. The explanate margin is wide and sloped downward; at its widest part it is considerably narrower than the interval between it and the suture. The prothorax is almost exactly of the figure that is known in mathematics as a section of an elliptic spindle and is

sunk between the prominent and somewhat acute humeral angles of the elytra to its lateral angles which are obtuse. This species is probably near *Coptocyclus Holmgreni*, Bohem., but I judge from the description of that insect that *inter alia* it differs much from the present one in color and marking.

N. Queensland; taken near Cairns by Mr. Cowley; also sent to me by Mr. Masters.

*C. maxima*, sp. nov. Scutiformis; nitida; valde convexa; pallide testacea, antennarum parte apicali nigra, elytrorum parte discoidali rufescenti nigro-variegata; antennis fere ad coxas posticas attingentibus, parte dimidia apicali quam basalis nonnihil robustiori, articulo 3<sup>o</sup> quam 2<sup>us</sup> vix longiori, 4<sup>o</sup> quam 3<sup>us</sup> fere duplo longiori, 5<sup>o</sup> quam 4<sup>us</sup> (et 6<sup>o</sup> quam 5<sup>us</sup>) sat breviori, 6<sup>o</sup>—10<sup>o</sup> inter se sat æqualibus, 11<sup>o</sup> quam 10<sup>us</sup> sat longiori; prothorace transverso sublævi, angulis lateralibus subacutis; elytris hic illic striis brevibus punctulatis impressis (in aliis partibus fere lævibus), pone scutellum alte gibbis, humeris leviter callosis; angulis humeralibus rotundatis fortiter (sc. ultra prothoracis angulos laterales) productis; tarsorum articulo apicali ultra præcedentem manifeste excedenti; corpore subtus fere lævi. Long., 6 l.; lat., 5 l.

The markings on the convex discal portion of the elytra are as follows:—On the retuse portion in front some inconspicuous blackish clouds, a linear interrupted blackish marking or series of marks running obliquely from the humeral callus to the suture at about its middle, an irregular blotch of blackish color near the apex of the suture which is obsoletely continued along the suture to its actual apex (on the explanate border). The form of the prothorax is peculiar; at either extremity of the front (evenly curved) outline (which represents I suppose the front and lateral margins) the outline is sharply rectangular; from this angle the prothorax narrows strongly hindward, its outline on either side being nearly an oblique straight line; this straight line at its hind extremity merges without a defined angle into the sinuate horizontal base which in the middle is moderately lobed hindward. The gibbosity behind the scutellum (in reality it includes the scutellum) is very pronounced (amounting to a large conical protuberance), the front slope of which bears a large deep fovea on each elytron. The explanate margin of the elytra is very wide, being at its widest part scarcely narrower than the interval between its inner margin and the suture. The fourth joint of the antennæ distinctly longer than any other joint except the first and eleventh is a very distinctive character. The appendiculation of the claws is, even more markedly than in

the preceding species, of the peculiar form that Dr. Chapuis attributes to *Chirida*. That learned author says that the structure is not quite that which the term "appendiculated" indicates; but that the base of each claw is dilated in such fashion as to produce the appearance (if the two claws be looked at from in front of them) of their basal parts being connected by a kind of erect quadrate lamella. The front margin of the prothorax does not project far beyond the head; when the antennæ are projected forward the apex of the basal joint is visible from above.

N. Queensland; near Cairns.

*C. (?) lacunata*, sp. nov. Breviter late ovalis (vel potius subquadrata); nitida; sat convexa; supra rufo-ferruginea, margine explanato (prothoracis toto, elytrorum in medio solum) testaceo translucido; capite (parte antica nigra excepta) antennis (parte apicali vix infuscata) pedibusque testaceis; corpore subtus nigro (abdominis apice testaceo); antennis elongatis ad coxas posticas attingentibus, articulo 3<sup>o</sup> quam 2<sup>us</sup> graciliori et paullo longiori, 4<sup>o</sup> quam 3<sup>us</sup> sat longiori, 7<sup>o</sup>—11<sup>o</sup> clavam laxam minus dilatatam formantibus; prothorace fortiter transverso, sat æqualiter elliptico, lævi (puncturis nonnullis sat magnis ante basin positis exceptis); elytris pone scutellum haud gibbis, vix striatis, striis sat regulariter punctulatis (puncturis in striis sat parvis), humeris sat callosis, angulis humeralibus rotundatis minus productis; corpore subtus sparsim perspicue punctulato; tarsorum articulo apicali ultra præcedentem vix excedenti; unguiculis appendiculatis (in sensu solito). Long., 2½ l.; lat., 2 l.

The claws of this species are very difficult to examine without breaking them off as they scarcely project from the penultimate tarsal joint and are recurved in form so as to be closely applied to its under surface. They are divergent (*i.e.* having their dorsal border lying in the direction,—or nearly so,—of the longitudinal line of the tarsus) and are appendiculate in the ordinary sense of the term, the front claws being more markedly so than the others (perhaps in one sex only). This species is difficult to place in Dr. Chapuis' classification of the *Cassididæ*: the only subfamily characterised as having the head covered by the prothorax and also the claws appendiculate is the *Chiridites*,—but in its single genus (*Chirida*) the appendiculation of the claws is of the peculiar structure mentioned above (under *C. maxima*), whereas in the present insect it is of ordinary structure. It would perhaps be justifiable on this ground to find a new generic name for this species, but for reasons mentioned above it seems at present desirable to avoid multiplications of genera for the Australian

species of this family ; at any rate under the condition in which I find myself of not having available for comparison a large collection of *Cassididae* from all parts of the world.

As a *species* this insect is very easily recognisable. The red color of its elytra extending over the explanate margin (which is fairly wide, but at its widest considerably narrower than the interval between it and the suture) except on a conspicuous yellow transparent patch placed at about the middle of its length characterises it quite unmistakeably.

N. Queensland ; given to me by Mr. French.

*C. simplaria*, sp. nov. Subrotundata ; sat nitida ; sat convexa ; testacea, supra parte convexa discoidali indeterminate obscuriori ; antennis fere ad coxas posticas attingentibus, subfiliformibus, articulis 3<sup>o</sup>—5<sup>o</sup> inter se sat æqualibus (quam 1<sup>us</sup> gracilioribus vix brevioribus, quam 2<sup>us</sup> gracilioribus multo longioribus) ; prothorace transverso fere æqualiter elliptico, vix manifeste punctulato, parte discoidali a margine explanato sulculo interrupto curvato et 4-foveolato leviter impressa distincta ; elytris vix striatis irregulariter fortiter seriatim punctulatis, hic illic irregulariter (et longitudinaliter et transversim) areis leviter convexis instructis, pone scutellum haud gibbosis, humeris callosis ; tarsorum articulo apicali ultra præcedentem vix excedenti ; corpore subtus fere levi. Long., 2½ l. ; lat., 2⅓ l.

An almost uniformly brownish testaceous insect, with the convex portion of the upper surface here and there more decidedly *brown* than the rest of the surface. Not quite so nitid as is the preceding (*C. multicolor*) and distinguishable also by the convex disc of the prothorax being separated from the explanate margin by an exceptionally distinct but much interrupted furrow in which there are four well marked large impressions. The shoulders of the elytra are rather strongly projected forward (reaching the middle of the prothorax), their front angles being obtuse. The more or less smooth (somewhat convex) spaces on the elytra are very ill defined and consist of two or three transverse and obliquely longitudinal patches placed in the neighborhood of the front half of the suture. The prothorax is very finely and closely but scarcely distinctly punctulate.

N. Queensland ; taken near Cairns by Mr. Cowley.

#### CASSIDA.

*C. Adelaidæ*, sp. nov. Ovalis ; sat nitida ; convexa ; rufobrunnea, corpore subtus obscuriori, antennis apicem versus picescentibus ; his brevibus (vix ultra coxas intermedias attingentibus), articulo 3<sup>o</sup> quam 2<sup>us</sup> graciliori et sat longior ;



(4° sat æquali), articulis ultimis 5 clavam laxam formantibus (10° fere transverso quam 11<sup>us</sup> fere duplo breviori); prothorace quam longiori dimidia parte latiori, antice late rotundato, postice sat fortiter bisinuato, subtilissime coriaceo et sparsim vix perspicue punctulato; elytris punctulato striatis, puncturis in striis crebre positis sat magnis, interstitiis discoidalibus latis leviter convexis, humeris vix callosis, angulis humeralibus obtusis modice productis, marginibus punctulatis minus latis; corpore subtus sublevi. Long.,  $2\frac{2}{3}$  l.; lat.,  $1\frac{2}{3}$  l.

Distinguishable from *C. mera*, Germ., and *C. denticulata*, Bohem., *inter alia* by the non-denticulate sutural apex of its elytra, from *navicella*, Bohem., by its head and undersurface not being black, &c., and from *perpusilla*, Bohem., by its much larger size.

S. Australia.

*C. prothoracica*, sp. nov. Late breviter ovalis, postice angustata; sat nitida; sat convexa; brunneo-testacea, antennarum parte apicali elytris et corpore subtus plus minusve infuscatis; antennis fere ut præcedentis (*C. Adelaide*) sed clavæ articulis paullo magis elongatis; prothorace fere ut præcedentis sed antice multo magis anguste rotundato; elytris vix striatis, seriatim punctulatis, inter series interstitiis haud convexis, humeris leviter callosis, angulis humeralibus minus obtusis modice productis, marginibus vix distincte punctulatis minus latis; corpore subtus sublævi. Long.,  $1\frac{1}{10}$  l.; lat.,  $1\frac{3}{10}$  l.

Distinguishable at once from the previously described Australian species of the genus by its non-striate elytra, the rows of punctures being separated by flat interstices. The infuscation of the elytra is variable and ill-defined consisting of a few elongate blotches of which the most constant appear to be two placed obliquely one on either side of the scutellum.

N.S. Wales; taken by Mr. Sloane near Mulwala.

#### ASPIDOMORPHA.

*A. planipennis*, sp. nov. Rotundata; minus convexa; nitida; testacea; antennarum apice, elytris (maculis 3 magnis transversim positis exceptis, sc. 1 communi a basi ad mediam partem suturæ extensa et utrinque macula ovali in margine explanato paullo pone basin posita), nigris; elytris pone scutellum haud gibbis, vix (striis subsuturali et externa exceptis) postice obsolete, callo humerali sat prominulo, angulis humeralibus obtusis, margine explanato quam discus nullo modo angustiori, disco medio paullo pone basin fovea profunda impresso.

Var. *macula communi elytrorum nigromaculata*, maculis lateralibus ad marginem extensa, et macula in margine explanato prope apicem addita. Long., 5 l.; lat.,  $4\frac{1}{3}$  l.

The notable character in this species is the great width of the explanate margins of its elytra which at their widest are fully as wide as the interval between the suture and the external stria. The insect is allied to *A. ramulopicta*, Wag., from which it differs *inter alia* by the character just cited, by the absence of a yellow spot in the front black part of the explanate margin, and by the elytra being without any gibbosity behind the scutellum and being much less evidently striate.

N. Queensland; taken by Mr. Cowley near Cairns; the var. taken by Mr. Masters.

*A. lauta*, sp. nov. Rotundata; modice convexa; nitida; testacea; prothoracis elytrorumque disco plus minusve brunnescentibus; horum sutura (plus minusve manifeste) et notula subsemicirculari (hac ab angulo humerali introrsum curvata, in discum paullo extensa et marginem lateralem paullo ante apicem attingenti) ferrugineis; elytris pone scutellum fortiter gibbis, aliter ut precedentis (*A. planipennis*). Long.,  $4\frac{2}{3}$  l.; lat.,  $3\frac{2}{3}$  l.

Owing to the colors of this species being all various shades of testaceous or reddish-testaceous they present a washed-out appearance which seems constant and characteristic. The only marking that is at all well-defined is a ferruginous curved mark on the elytra which commences at the humeral angle and curves inward (reaching about its middle just on to the discal side of the external stria) arriving at the lateral margin again a little before the apex. It is distinguished from most of its allies by the antennæ being constantly unicolorous. The explanate margin of the elytra (as in *A. planipennis*) is at its widest fully as wide as the interval between the suture and external stria.

N. Territory of S. Australia; near Port Darwin. A N. Guinea species (which I have been unable to identify) is near this one but has elytra almost impunctulate.

#### COCCINELLIDÆ.

##### RHIZOBIUS.

*R. secessus*, sp. nov. Breviter late ovalis; valde convexus; minus nitidus; pube albida suberecta et setis longioribus magis erectis vestitus; ferrugineus, metasterno piceo, antennis pedibusque rufo-ferrugineis; capite prothoraceque crebre subtiliter, elytris sat subtiliter (sed quam prothorax sat fortius) crebre, punctulatis; prosterno medio longitudinaliter

depresso, spatio depresso antice sat angustato utrinque subtiliter carinato. Long.,  $1\frac{1}{2}$  l.; lat.,  $1\frac{1}{10}$  l.

In my tabulation of the species of *Rhizobius* (Tr. Roy. Soc., S.A., 1892 pp. 257 &c.) this species should be placed along with *R. discolor*, Er., and *Evansi*, Muls., from both of which it differs *inter alia* by the much finer puncturation of its elytra.

Victoria; taken at the Hermitage, on the Dividing Range.



## NOTES ON THE GEOLOGY OF THE NINETY-MILE DESERT.

BY EDWARD VINCENT CLARK, B.Sc.

[Read April 14, 1896.]

### PLATE, I.

The geology of the area enclosed between the River Murray on the north and west, and the Victorian frontier on the east, is little known, with the exception of the more southerly portion, where the Eocene beds of the Mount Gambier District are found. The object of this paper is to bring into notice several Tertiary deposits occurring in or near the Ninety-Mile Desert.

The Mount Gambier beds are fairly well known, and have frequent outcrops from Kybybolite, where they have an altitude of about 300 feet, and Narracoorte, 270 feet, to MacDonnell Bay, where they pass below sea level, thus having a dip of about three feet per mile, as Kybybolite—according to the Rev. Tenison-Woods, the most northerly point in this district having an Eocene outcrop—is about 100 miles from the coast.

A well sunk at Bordertown by the Railway authorities revealed a polyzoal limestone some distance below the surface, and a short time ago I obtained several fossils from various wells, five or six miles south of Bordertown. The matrix of the bed is very similar to that of the Mount Gambier Eocene, being almost a pure limestone, composed mostly of broken pieces of polyzoa, with a few large fossils. This limestone forms the base of the wells, which are about 70 feet deep, but as, unluckily, I was not present at the digging of any well, I am unable to say how near to the surface these beds extend. As the Bordertown Railway Station is 268 feet above sea level, these beds have an altitude of about 200 feet, or perhaps more. According to the dip, above mentioned, of the Mount Gambier beds, they should have an altitude of about 400 feet, but although they may originally have had this altitude and have been worn down before the deposition of the present surface material, this is not likely. Still, considering the similarity in the lithological features of the bed here and further south, there is no reason to doubt the continuity of the Bordertown bed, and the Eocenes of Narracoorte and Mount Gambier.

The fossils found at Bordertown were not numerous, either as

regards species or specimens, but by searching the debris round various wells I obtained the following:—

*Pecten polymorphoides*, *Zittel*  
*Pecten Gambierensis*, *Ten.-Woods*  
*Amussium Zitteli*, *Hutton*  
*Waldheimia divaricata*, *Tate*  
*Terebratella Woodsii*, *Tate*  
*Terebratulina catinuliformis\**, *Tate*  
*Magasella Woodsiana*, *Tate*  
*Psammechinus Woodsii*, *Laube*  
*Hemiaster planedeclevis*, *Gregory*  
*Lovenia Forbesii*, *Tenison-Woods*  
*Scutellina patella*, *Tate*.

also numerous polyzoa, and the carapace of a crustacean.

With the exception of the *Pecten Gambierensis*, which is perhaps only a variety of *P. polymorphoides*, all the above-named species occur in the River Murray cliffs, while only five, namely *Pecten Gambierensis*, *Amussium Zittelli*, *Terebratulina catinuliformis*, *Magasella Woodsiana*, and *Scutellina patella* are to be found in any part of the Mount Gambier series, so we see here that while the character of the stone agrees with that of the Mount Gambier deposits, the fauna it contains has greater affinity with the beds of the Murray Cliffs.

By the kindness of Mr. J. W. Jones, the Conservator of Water (to whom my sincerest thanks are due for supplying me with material from various bores, and also for many suggestions concerning this paper), I acquired some fossils obtained at a depth of 200 feet from a well at Pinnaroo; and as the altitude of that place is only about 250 feet, these fossils were found not far above sea level. However, I saw no samples of stone from any other part of the well; and so these may easily have been found near the base of the Eocene deposits there. The fossils were mainly in the form of casts, with the exception of several pallio-branches, including *Waldheimia Garibaldiana*, *W. grandis*, and *Magasella compta*. Besides these there were recognisable, as far as casts ever can be determined, *Cucullæa Corioensis*, *Cassia exigua*, a *Conus*, and one or two *Cypræas*. This bed is clearly Murravian, both on lithological and on palæontological grounds, and so we have a connecting link between Bordertown on the south and the River Murray on the north, Pinnaroo being nearly midway between. In all probability bores put down north of Bordertown would reveal the polyzoal limestone of Mount

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\* NOTE.—This species is usually known as *T. Davidsoni*. As another species has this name the Australian shell has been re-named as above by Professor Tate.

Gambier, becoming more and more arenaceous, with a corresponding decrease of polyzoa and increase of the mollusca, till at Pinnaroo we get the almost typical Murravian bed. The chief objection to this view is that if the dip of three feet per mile, as shown between Narracoorte and Port MacDonnell, were continued northwards, the Murray Cliffs should be about 1,000 feet above sea level, excluding the Miocene covering; whereas the Eocenes of the Murray rarely reach an altitude of more than 200 feet. Still, this is not a very serious objection, as we saw that the beds at Bordertown are not nearly so high as they would be according to this dip, and so we might very reasonably consider that the beds further north ought to have very little dip at all, if any, or perhaps they may undulate to a small extent.

The country to the west of Bordertown, to the Murray, is practically a geological *terra incognita*. As the ground descends considerably from Bordertown along the line, so that at Wirrega, 13 miles away, the altitude is 210 feet; and at Keith, 15 miles further, only 101 feet, one might expect an outcrop of the polyzoal limestone to occur; but I have been unable to hear of any such outcrop,—and it is improbable that one could exist without being known,—so we may assume that there is none such. However, at Coonalpyn, Ki Ki, Tintinara, and Emu Flat bores have been put down by the Government; and the Conservator of Water, Mr. Jones, allowed me free access to the boxes of samples of stone obtained from them. Each bore meets Eocene strata at a moderate depth below sea-level, and of considerable thickness, while all four bores show great similarity in the beds through which they pass.

KI KI, the most westerly bore, is situated on the railway line about 105 miles from Adelaide, or nine miles west of Coonalpyn. The mouth of the bore is 68 feet above sea-level, and the total depth of the bore 666 feet.

For a depth of 145 feet, or to 77 feet below sea-level, unfossiliferous limestones are found. Then comes a bed of Eocene polyzoal limestone, having a thickness of 195 feet, but containing few fossils other than polyzoa. This bed is met with in each bore, and from it I have obtained *Terebratulina lenticularis*, *T. catinuliformis*, *Magasella* sp., *Salenia tertiaria* (?), and *Scutellina patella*. Below this in each bore is found a black clay intercalated with fossiliferous sands.

In the Ki Ki bore these clays and sands alternate for 108 feet, or to a depth of 380 feet below sea level, when the bed rock is met with at first a light colored clay, becoming by degrees much harder till at the base of the bore, 600 feet below sea level, it becomes almost a slate.

The black clay is very noteworthy. It varies from a brownish

color, in some places containing a few bits of fossil shells, to an intense black, with no visible trace of fossil remains at all. It is usually highly carbonaceous, and in the Coonalpyn bore at one point actually becomes a lignite, which will burn if held in a flame, though like charcoal it does not give out sufficient heat to keep alight by itself. In each bore the first deposit below the polyzoal limestone is a band of this clay, but after that the different bores vary in their arrangement of the sand and clay.

This sand contains at Ki Ki numerous polyzoa and a goodly number of gastropods, with a few lamellibranchs, nearly all very small, and all showing signs of being greatly worn, proving the deposit to be littoral. Professor Tate gives the opinion that these shells more nearly resemble those of the Adelaide Eocene beds than those of any other deposit, though many of them appear to be new species. Here we see, as at Aldinga (which is pretty well identical with the Adelaide deposits) that the polyzoal limestone overlies the bed containing gastropods.

At COONALPYN the bore is very similar, except that the altitude of the various beds differs a good deal.

The surface of the bore is 72 feet above sea level, and the unfossiliferous limestone has a thickness of 75 feet. Then come the polyzoal limestones, extending to a depth of 262 feet, *i.e.*, having a thickness of 259 feet. Next we have the intercalated sands and clays for 196 feet, the bed-rock being reached at a depth of 458 feet, while the bore descends 758 feet below sea-level. There is no great difference between the beds in this and in the Ki Ki bore, except that the sand beds here contain very few fossils except polyzoa, though careful searching reveals a few gastropods, among which is a *Turritella*, very like, if not identical with, *Turritella Aldingæ*. We see also that the sands and clays have a much greater thickness here than at Ki Ki, the difference, 88 feet, being mainly at the bottom, and due to the slope of the bed-rock.

The TINTINARA bore is peculiar in that the unfossiliferous limestone overlying the Eocene in both other bores is here entirely absent, and in its stead we find a deposit of recent shells of a thickness of 154 feet, *i.e.*, extending to 92 feet below sea-level. Then the polyzoal limestone, instead of being 250 feet, as at Coonalpyn, is reduced to six feet, the black clay, which here is not so carbonaceous, being met with at a depth of 98 feet. The sands associated with this clay appear to be fairly fossiliferous, but the bore only reaches a depth of 191 feet (or to 253 feet from its mouth), and consequently the bore ends in Eocene beds.

EMU FLAT is situated about five miles from the railway, Keith being about the nearest point. Here we find the Recent or Pleistocene beds of the Tintinara bore absent, but the unfossil-

iferous limestone of Coonalpyn and Ki Ki has reappeared. This deposit descends to 21 feet below sea-level. Then the polyzoal limestone succeeds for a thickness of 88 feet, and at 109 feet below sea-level the clays and sands begin, the latter in this bore containing very few fossils of any sort whatever. The bore only goes down 168feet below sea-level, and does not bottom the Eocenes.

The relative positions and depths of these four bores are shown on the accompanying horizontal section, together with a well-section at Bordertown, and the section of a bore situated four miles east of Wellington, the latter recorded by Prof. Tate. (Trans. Roy. Soc. vol. IV., p. 144). The mouth of the bore near Wellington is near sea-level, and for 56 feet are met the polyzoal limestone, and below for a little over 100 feet are sands and clays, which, although unfossiliferous, probably correspond to the lower of the Eocene beds shown by the four bores; the bed-rock was just about reached at the bottom, 167 feet below sea-level.

If the lines of demarcation are marked out on the map as far as possible, they will be found very irregular in shape, and the thickness of each bed varies greatly, the irregularity of the line of separation of the Eocene polyzoal limestone and the underlying clays, apparently showing that their formation depended partly at any rate, on purely local causes, as we cannot consider the intercalated sands and clays to have been denuded into their present shape to make room for the overlying polyzoal limestone.

It seems probable that this limestone is a continuation of the somewhat similar beds at Bordertown, and unites them to the Murray beds at Tailem Bend and Wellington. If this is actually the case, we have very good evidence to show that the Aldinga and Adelaide gastropod-beds are older than the Eocene beds of the Murray since, as mentioned before, the sands of the Ki Ki Bore seem to closely approximate in their fossils to the Adelaide beds.

A peculiarity about the more recent deposits overlying these Eocenes, is the fact that in the Tintinara Bore alone do we meet with recent marine shells, while we get here none of the unfossiliferous limestone which in each of the other beds overlies the Eocene limestone. These fossils bespeak an extremely recent age, Pleistocene if not Post-pleistocene, and it seems strange that they are not met elsewhere. The probable explanation is, that at Tintinara, (as in the other bores) in post-Eocene times the Eocene deposits became covered with this unfossiliferous limestone, presumably a land formation, but that subsequently it was worn away at Tintinara, and with it very likely some portions of the polyzoal limestone, which is here reduced to six feet in thickness,



and then very recently this gap was filled up by a sandy material containing these shells, which are in a very good state of preservation. The relationship of these beds is shown on the diagram, representing a section along the railway line from Bordertown to Tailem Bend.

The Eocene beds of the Mount Gambier district are entirely isolated from all other Eocene deposits, not only by their position, far removed from all other places where outcrops occur, but also by their fauna, which, with the exception of polyzoa, is extremely limited, consisting of about sixteen molluscs and six echinoderms, many of which are widespread forms. However, by the wells at Bordertown and Pinnaroo, we see the probable continuity of the Mount Gambier beds with those at Overland Corner, while the four bores in the Ninety-Mile Desert show that the same beds, at a lower depth, join on to the Murray Beds at Tailem Bend, and thus it is safe to say that the Murravian and Mount Gambier Eocenes are portions of the same deposit.

Then also the similarity of the fauna of the sands met with in the Ki Ki bore with that of the Aldinga marls, would show that these two beds were deposited at the same time, from which we might infer that the polyzoal limestone which overlies the marls at Aldinga is contemporaneous with the similarly composed beds resting on the sands and clays, as shown in the accompanying diagram, and therefore with the Mount Gambier and the Murravian deposits. Still, we see from the four bores above described that the line of separation of the sands and clays from the overlying polyzoal rock is very irregular, which tends to prove that, although on the whole the sands are the older of the two beds, nevertheless they were being deposited at the same time in localities very near together, and that therefore local causes had a good deal to do in determining their deposition; so that considering how far removed are Aldinga and the Murray Cliffs, we might be making a mistake in saying that the Aldinga marls are older than the Murravian limestone, though this is probably the case; and at any rate we may be fairly safe in concluding that no period of any length separated their formation.

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#### SUPPLEMENTARY NOTE.

Since the above was written Professor Tate has examined fossils from the Eocene sands of the Ki Ki bore (380-424 feet below the surface) and has identified the following species and genera:—

- Terebratulina*, sp. (prob. fry of *T. Scoulari*, *Tate*). (passim).  
*Crassatella communis*, *Tate*. (passim).

- Carditella, *n. sp.*  
 Limopsis multiradiata, *Tate.* (Aldinga.)  
 Plagiarca cainozoica, *Tate.* (passim.)  
 Trophon, *sp. aff. polyphyllus, T.-Woods.* (Muddy Ck., Spring  
 Ck., Mornington.)  
 Triton, *sp. indet.*  
 Tritonidea, *n. sp.*  
 Nassa? *sp.*  
 Ancillaria ligata, *Tate.* (Aldinga.)  
 Trivia, *n. sp. aff. T. pompholugota, Tate.*  
 Turritella, *sp., worn (prob. T. Aldingæ, Tate).* (Aldinga.  
 Cape Otway.)  
 Eulima, *n. (?) sp.*  
 Ataxocerithium concatenatum, *Tate.* (Aldinga. Muddy  
 Creek.)  
 Triforis, *sp.* (Aldinga.)  
 Lovenella, 5 *spp.*  
 Litiopa, *n. sp.*  
 Rissoa, *sp.* (Muddy Creek.)  
 Rissoa, 2 *n. spp.*  
 Liotia Roblini, *Tate.* (River Murray, Muddy Creek, Table  
 Cape.)  
 Delphinula, 2 *n. spp.*  
 Phasianella, *n. sp.*  
 Leptothyra parvula, *T.-Woods.* (Muddy Creek. Corio Bay.)  
 Leptothyra, *sp.*  
 Calliostoma, *sp.*  
 Euchelus, *sp.*  
 Meretrix, *sp., indet.*  
 Amphihelia striata, *T.-Woods.* (Aldinga.)

*n. sp.* signifies not identical with any belonging to other Eocene sections in Australia.

The names in brackets after various species are the localities whence those species have already been obtained, "passim" denoting a species found at all, or nearly all, Australian Eocene outcrops. Professor Tate remarks, with regard to the fossils *tous ensemble*, "Specimens usually much broken, or juvenile; hence specific determination not admissible, or only by troublesome comparisons, which time has not permitted to be given." This accounts for the large number on the list unnamed. Of those that have been worked out, we have in all 23 species, of which ten are hitherto unrecorded, and three widely distributed; while of the others six have been found at Aldinga and Adelaide, four being till now unrecorded elsewhere, and five at Muddy Creek, to which place, however, only one is peculiar. Thus we

are justified in saying that the fauna more resembles that of Aldinga than of any other locality.

From the Tintinara bore, at a depth of 244 to 253 feet, were obtained the following lamellibranchs among other molluscs not yet worked out:—

*Leda planiuscula*, *Tate*. (Aldinga.)

*Leda* sp. aff. *leptorhyncha*, *Tate*.

*Limopsis insolita*, *Sowerby*. (Aldinga, Spring Creek, Cape Otway).

*Arca* n. sp. aff. *A. equidens*, *Tate*.

*Cardita* (?) n. sp.



# CORRELATION OF THE MARINE TERTIARIES OF AUSTRALIA.

## PART III., SOUTH AUSTRALIA AND TASMANIA.

WITH GENERAL REMARKS AND APPENDICES.

By Professor RALPH TATE and J. DENNANT, F.G.S., F.C.S., &c.

[Read May 5, 1896.]

### PLATE II.

#### CHAPTER I. SOUTH AUSTRALIA.

##### I. GEOGRAPHIC DISTRIBUTION OF EOCENE STRATA.

The chief areas occupied by deposits of this epoch are:—

1. The plateau terminating in the sea-wall extending from Wilson Bluff on the West Australian Boundary to the Head of the Great Australian Bight.\* The coast section has been described.

2. *Spencer Gulf*.—Point Turton in the southern part of Yorke Peninsula is an outlier of polyzoal limestone †, also about the shore of Wallaroo Bay, and extending inland to Boor's Plain.

3. *St. Vincent Gulf*.—The west shore extending from Edithburg to near Black Point is occupied by cliffs of polyzoal limestones; a representative section is that of Surveyor's Point ‡; outliers occur to the north of Black Point in the neighbourhood of Ardrossan. §

On the east shore-line of St. Vincent Gulf, older Tertiary strata developed beneath Adelaide and its immediate vicinity have been described. ||

The older Tertiary sections, displayed in the sea-cliffs of Aldinga Bay, to which reference has been made in some of the above-quoted papers, have not been described in detail, an omission that it is now sought to supply. A brief summary was,

\* Tate, Trans. Roy. Soc., S. Aus., II., pp. 102-111, 1879.

† Tate, id., XIII., pp. 112-114, 1890.

‡ Pritchard, id., XV., pp. 179-180, 1892.

§ Tepper, Roy. Soc. S. Aust., II., pp. 72-76, 1879.

|| Tate, id. V., p. 40, 1882; XIII., p. 180, 1890.

however, published in 1878 (Tate, Roy. Soc., S. Aust., I., p. 121) as under:—

- a. Lacustrine clays, no fossils... .. 48 ft.
- b. Upper Aldinga Series, calciferous sandstones and impure limestones with oyster banks ... .. 22 ft.
- c. Lower Aldinga Series, consisting of beds of a most diversified character—clays, limestones, and sands, rapidly replacing one another in horizontal and vertical extension ... .. 80 ft.

A correlation with other sections was attempted by the same author, *op. cit.* II., p. liii., and at p. lviii. the term Eocene was applied to the Lower Aldinga Series, and that of Miocene to the Upper Series.

4. *Kangaroo Island*.—The small outlier of Eocene limestone near Kingscote, first indicated by Peron, has been described by Tate, *op. cit.* VI., p 122, 1882.

5. *River Murray Plain*.—The literature relating to the geology of this extensive area, as well as detailed descriptions of the sections, age, and correlation, has been dealt with by Tate, *op. cit.* VII., pp. 24-41, 1885.

6. *Mount Gambier District*.—Tenison Woods' "Geological Observations," London, 1867, embodies the chief literature relating to the geology of this area.

Mr. Edward V. Clark, in a paper read this year before this Society submits proof of the subter-connection of the limestones of the Mount Gambier area with the more arenaceous beds of the Murravian area, and indicates the occurrence of deeper-seated sands, the fossils of which seem to be part of the fauna characterising the inferior beds of the Aldinga section.

## II. MIOCENE AND ITS RELATION TO EOCENE.

1. *River Murray Cliffs*.—The oyster-beds or Upper Murravian Series were detached from the underlying Eocene calciferous sandstones on palaeontological data, but re-examinations of the section in the cliffs at Nor-West Bend leave no doubt of a genuine erosive surface between the two sets of beds.

2. *Adelaide*.—Burr\* was the first to describe the lithological features of the beds on which the city of Adelaide stands, and considered them to belong to the Tertiary period, without assigning any definite age. Sturt recognised, however, that these beds

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\* "Remarks on the Geology of South Australia," Adelaide, 1846.

were of "the same kind of fossil formation as that on the banks of the Murray." This correlation applies to the Miocene only.

3. *Aldinga Bay* and *Hallet's Cove*, east side of St. Vincent Gulf.

Only the basal part of the Miocene Series is here fossiliferous, and because of the prevailing sandy matrix, the majority of the fossils are in the state of casts, though occasionally, when the matrix is more consolidated and somewhat calciferous, the tests of the fossils occur as pseudomorphs after calcite, though those originally calcitic are unaltered.

The fossiliferous Miocene beds directly overlies those of the Eocene, and the stratigraphical discordance between them is marked by erosive surfaces, more or less of the nature of pot-holes, but more particularly by the transgression of the Miocene over the edges of the Eocene strata, which have a higher dip; this feature is most discernible in the face of the cliffs extending from the jetty southward towards Schnapper Point for a length of a hundred chains. The topmost of the hard arenaceous bands of the Miocene in Blanche Point, which is at an elevation of 80 feet above sea-level, declines to high water-mark at Schnapper Point in a distance of two miles, corresponding with a dip of 1 in 132. In Maslin's Beach to the north of Blanche Point, the echinodermal bed of the Eocene shows a dip of  $2^{\circ} 7'$  in approximately the same direction, that is south-west, as that of the observed inclination of the Miocene to the south of the jetty; but moreover, in the north face of Blanche Point, which has approximately an east and west bearing, the Eocene strata have a dip of  $5^{\circ}$ , whilst the Miocene beds are apparently horizontal.

At the mid-part of the Aldinga Bay section the Miocene consists, in the basal portion of sharp sands and calciferous sandstone, and in the upper portion of unfossiliferous blue clays, which change to the northward into red mottled sands and sandy clays, also unfossiliferous.

Beyond the limits of the occurrence of Eocene beds to the northward, as about Pedlar's Creek (sections 353, 356, 359, see map), the base of the Miocene is a conglomerate, resting on Archæan rocks, succeeded by a calciferous sandstone more or less commingled with pebbly grit in which fossils occur; the uppermost and larger part of the sections consists of variously colored sands and sandy clays. The finest sections of this type occur from a little north of Witton Bluff, by the mouth of the River Onkaparinga to beyond Black Point, forming the north headland of Hallett's Cove; beyond this the Miocene thins off and is represented by the conglomerate-base, which on the cliffs at Marino, south side of Holdfast Bay, is covered by the mammaliferous drift of the Adelaide Plain.

The section at Hallett's Cove is as follows :—

	Feet.
Red and grey argillaceous sands	80
Sand-rock	1
Sands (yellow)	50
White chalky limestone, with much sharp quartz-sand interspersed ; fossiliferous	4
	135

The common fossils are *Potamides* sp., *Pecten antiaustralis*, *P. consobrinus*, *Spondylus Aldingensis*,\* *Placunanomia Ione*, *Ostrea arenicola*, *Anapa variabilis*, *Laganum platymodes*, and *Orbitolites complanata*.

### III. THE EOCENE OF ALDINGA BAY.

Though a reference to this most important and instructive section was published as early as 1878, yet as previously stated, no detailed description has been given. The characteristic features of it are :—The varied nature of its sediments, the largely unique fauna, and diverse life-groups co-ordinate with the change in sedimentation.

The Eocene beds occupy a continuous section of nearly three miles in length, commencing about 40 chains due north of Blanche Point, and terminating southwards on the approach to Schnapper Point, where they descend below sea-level, but they reappear on the extreme south of Aldinga Bay. (See map.)

The Eocene and the overlying Miocene occupy a small basin of low-level country bounded all round, except the sea-frontage, by more elevated country occupied by Archæan rocks. The most inland occurrence of Eocene strata is at Tintaro (Section 681, Hundred of Willunga) about five miles due East from the coast.

The maximum inclination of the Eocene strata is  $5^{\circ}$  in a direction W.  $10^{\circ}$  S., from which is deduced an increasing altitude in an easterly direction; this is partly corroborated by a few well-sinkings and quarries situated at various distances, up to a mile or so from the coast. The occurrence of bedded deposits with *Turritella Aldingæ* at elevations up to 250 feet in Maclaren Vale (sections 126, 127, 137), and of blocks of a siliceous rock charged with Eocene fossils at an elevation of 600 feet at Tintaro (section 681), cannot be accounted for on the basis of the observed dip of the coastal sections; but they point to a basal deposit having a slope corresponding with that of the surface on which they rest.

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\* *Pecten spondyloides*, mihi, proves to be a *Spondylus*, and as the original species-name is incompatible with the revised generic location, it is altered as above.—R. T.

The diversified material composing the Eocene strata as seen on the coast, the arrangement of the material, and an increasing altitudinal range passing inland, point to a large fan-like accumulation adjacent to a sinking land-surface with a sea-scarped front, over which the sediments have been poured down. If such has been the case, it is not possible to determine the thickness of the mass on the basis of an observed inclination and horizontal extension of the deposit; moreover, it appears as we recede from the main locus of accumulation that the nature of the material changes, and finally gives place uniformly to a polyzoal limestone, such as characterises the line of sea-cliffs on the west side of St. Vincent Gulf. And it is noteworthy that this last deposit, uniform in itself, contains the more widely diffused organic remains; the more local sediments have for the most part restricted species.

A similar, but smaller, basin is that which has its chief locus of accumulation in Witton Bluff, being separated from the former by the Archæan outcrop, which extends inland from near the mouth of Pedlar's Creek.

It is impossible by words to adequately convey to the mind the changing nature of the Eocene sediments composing this section, but as making some approach in that direction, a few vertical sections at varying intervals throughout the whole cliff frontage are now presented:—

NORTH OF BLANCHE POINT, MASLIN'S BAY (1) IN ALIGNMENT OF E. & W. ROAD BETWEEN SECTIONS 374 AND 375.

		ft. in.	
52 ft.	{	Greenish marly sand rock and mottled (red and white) sand rock ... ..	30 8
		Whitish-yellow nodular impure limestone	21 4
		White and brown sands in courses ... ..	
EOCENE. 68 ft.	{	Glauconitic limestone ... ..	4 0
		passing into sand ... ..	3 0
		Iron-shot sand, drift-bedded — ... ..	61 0
		High-water-mark ... ..	

NORTH OF BLANCHE POINT, MASLIN'S BAY (2).

		Recent travertine and soil ... ..	5 6
MIOCENE. 64 ft. 6 in.	{	Green marly sand-rock ... .. about	12 0
		Red and white (mottled) sand-rock ... .. about	25 0
		Raggy white calcareous sand-rock ... ..	6 6
		Fine yellow sand... ..	1 2
		White calcareous sandy clay with calcareous bands ... ..	19 10
EOCENE. 39 ft. 8 in.	{	Glauconitic white limestone, very fossiliferous, rich in echinoids and palliobranchs	4 0
		Greenish colored sands somewhat calcareous	11 0
		Brown iron-shot sands (teeth of <i>Lamna</i> sp.)...	24 8
		High water-mark	



## SOUTH PROJECTION OF BLANCHE POINT (3).

		ft. ins.
RECENT.	Soil and travertine ... ..	—
MIOCENE. 60 ft. 5 ins.	{ Whitish sand clays ... .. } { Red and greenish clays ... .. }	38 0
		9 6
	Rubbly limestone ... ..	1 0
	White arenaceous limestone (fossiliferous) ... ..	6 8
	Cavernous limestone ... ..	3 9
	Red sand with oysters ... ..	2 6
EOCENE. 58 ft. 4 ins.	{ Brown sandy marls ... .. } { Blackish calcareous clays, in bands, with in- dured surfaces ... .. }	29 0
		10 4
	Ditto, with courses of turritellæ and nodular limestone ... ..	20 0
	Low-water mark	—
		120 9

## CLIFF SECTION, NORTH OF JETTY, AND SOUTH OF BLANCHE POINT (4).

MIOCENE.	14 ft.	Grey limestone ... ..	about 14 0
EOCENE. 40 ft. 10 ins.	{ Yellow calciferous sand... .. } { Polyzoal bed—a coarse sand and small gravel with polyzoa (at certain points this bed is exclusively composed of polyzoa com- pacted into a fissile, current-bedded rock) ... .. } { Fine grey sand with small gravel ... .. } { Green and yellow clayey sand ... .. } { Brick-red clayey sand ... .. } { Brown, and yellow and brown, clayey sand... } { Black clay, very fossiliferous*.. ... .. }	24 0	
		5 6	
		0 10	
		2 2	
		0 7	
		2 3	
		5 6	
High water-mark, below which argillaceous limestones appear.			

## PORT WILLUNGA JETTY (5).

MIOCENE. 60 ft. 4 in.	{ Soil and travertine ... .. } { Blue clay ... .. } { Rubbly grey limestone mixed with sand in lower part; casts of fossils ... .. } { Arenaceous calcareous bands with interca- lated sands.† Oyster bed, at a depth of 4 ft. 3 in. from top. ... .. } { Unconformity. }	6 0
		41 0
		7 7
		11 9
		—
EOCENE. 19 ft. 6 in.	{ Calcareous sand-rock with hard concreted portions at top and siliceous bands at bottom.‡ ... .. } High water-mark.	19 6

\*Common fossils—*Chione cainozoica*, *Limopsis insolita*, *Triton tortirostris*.†Common fossils.—*Ostrea arenicola*, *Pecten lucens*, *P. subbifrons*, *P. antiaustralis*, *Spondylus Aldingensis* (*Pecten spondyloides*), *Laganum platymodes*.‡*Scalaria Marice*, *Waldheimia furcata*, *W. sufflata*, *Magasella Woodsiana*, *Pecten Eyrei*, *Fibularia gregata*, *Graphularia senescens*.

## SOUTH SIDE, ALDINGA BAY.

Front of "red loam" cliffs faced by a mural line of calcareous rock, largely made up of echinodermal and polyzoal debris; the upper part rather harder and weathering ruggedly and fantastically; the lower part hollowed out into caves and tunnelled through to the "red-loam" at the back. Height of wall about 20 ft. Dip apparently west; the whole seems as if it had been thrust forward by the weight of the "red loam."

The glauconite limestone is rich in palliobranchs and echinoderms, some of the former and most of the latter being confined to it.

The lower portions of the *Turritella*-banks of Blanche Point contain very few species, though densely packed with *Turritella Aldingæ*, and with *Entalis subfissura* common. Towards their upper part, species occur in considerable numbers, and individuals abound; among the commoner ones may be mentioned:—*Peristernia Aldingensis*, *Murex sublevis*, *Triton oligostirus*, *Voluta pagodoides*, *Ancillaria ligata*, various species of *Pleurotoma*, *Erato pyrulata*, *Trivia arellanoides*, *Natica Aldingensis*, *Amussium Zitteli*, *Leda Huttoni*, *L. planiuscula*, *L. apiculata*, *L. leptorhyncha*, *Arca equidens*, *Cardita latissima*, *Meretrix tenuis*, *Corbula pyxidata*, *Myodora lamellata*, *Terebratulina triangularis*, *Trochocyathus heterocostatus*, *Notocyathus Tateanus*, *Bistylia adherens*, and other corals.

The marls which succeed are sparsely fossiliferous, and the fossils are not always obtainable in good condition, but the best time for collecting is in fine weather, just after a copious rain. For the most part, the species have ascended from below; but a species of *Potamides* may only be obtained here. Continuing south to the cliff section No. 4, the marls pass to the condition of a black clay, containing many of the species belonging to the Blanche Point marls, of which *Limopsis insolita* is profusely abundant, and of large size; hence the bed has been called the "Limopsis-clay."

The calciferous sand-rock so extensively developed on the south side of Port Willunga Jetty does not contain a great variety of fossils, though individuals are fairly abundant; the chief species, except among the Polyzoa, are:—*Pecten Eyrei*, *Waldheimia furcata*, *W. Garibaldiana*, *W. sufflata*, *Scalaria Mariae*, *Eupatagus decipiens*, *Marettia anomala*, *Antedon* sp., *Graphularia senescens*.

In the following summary and table of species belonging to the Adelaide and Aldinga sections, account is taken of the Eocene strata only.

## I. PALÆONTOLOGICAL SUMMARY.

## ALDINGA AND ADELAIDE (EOCENE).

	No. of Species.	No. of Restricted Species.
Pisces ... ..	2	0
Cephalopoda ... ..	2	0
Gastropoda ... ..	182	126
Scaphopoda ... ..	3	1
Pteropoda ... ..	1	1
Lamellibranchiata ... ..	77	35
Palliobranchiata ... ..	25	7
Polyzoa ... ..	47	16
Echinodermata ... ..	22	7
Zoantharia ... ..	14	9
Total ... ..	375	202

With this total of 375 species, 184 genera are represented, being an average of little more than two species to each genus, which is a high proportion of diversity.

Though only two genera are peculiar, viz, one bivalve (*Limarca*), and one coral (*Bistylia*), yet the stratigraphical distribution of several genera is of a high antiquity:—*Plagiarca*, *Plesiopitron*, *Clavilithes*, *Conorbis*, *Mesalia*, and *Ampullina* among Mollusca; *Paradoxechinus*, *Holaster*, *Cardiaster*, and *Hemiaster* among Echinodermata; *Notocyathus*, *Trematotrochus*, *Conosmilia*, *Cyathosmilia*, and *Graphularia* among Zoantharia.

Of all the Australian sections they are the richest in in Palliobranchs and Echinoids.

The living species of Mollusca (except Polyzoa) are *Saxicava australis* and *Rhynchonella squamosa*, or two in a total of 290, which equals '69 per cent.

The percentage of restricted species is 54, whilst a considerable number of the extra-limital species are in common, either separately or collectively, with Cape Otway and Spring Creek.

## II. LIST OF EOCENE FOSSILS.

## ALDINGA AND ADELAIDE.

[Index numbers to localities:—1, Cape Otway; 2, Table Cape; 3, Spring Creek; 4, Geelong; 5, Birregurra; 6, Camperdown; 7, Gellibrand; 8, Muddy Creek; 9, Murray River; 10, Mornington; 11, Bairnsdale; 12, Mount Gambier.]

## GASTROPODA.

Typhis tripterus, <i>Tate</i> ... ..	-	-	-	-	-	-	-	-
“ tetraphyllus, <i>Tate</i> , n. sp. ... ..	-	-	-	-	-	-	-	-
Murex calvus, <i>Tate</i> ... ..	1	-	-	-	-	-	-	-
“ manubriatus, <i>Tate</i> ... ..	-	-	-	-	-	-	-	-
“ bifrons, <i>Tate</i> ... ..	1	-	-	-	-	-	-	-
“ Adelaidensis, <i>Tate</i> ... ..	-	-	-	-	-	-	-	-
“ tenuicornis, <i>Tate</i> ... ..	-	-	-	-	-	-	-	-
“ sublaevis, <i>Tate</i> ... ..	-	-	3	-	-	-	-	-
“ asperulus, ? <i>Tate</i> ... ..	-	-	?3	-	-	7	8	10
“ prionotus, <i>Tate</i> ... ..	1	-	-	-	-	-	-	-







<i>Crenella globularis</i> , Tate	...	2	3	-	-	-	8	9	10	-	-
<i>Nucula semistriata</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Leda apiculata</i> , Tate	...	1	2	3	4	-	7	8	-	10	-
“ <i>Huttoni</i> , T. Wds.	...	-	2	3	-	-	6	7	8	-	10
“ <i>leptorhyncha</i> , Tate	...	1	-	-	-	-	-	-	-	-	-
“ <i>planiuscula</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Limopsis insolita</i> , Sov	...	1	-	3	N.Z.	-	-	-	-	-	-
“ <i>multiradiata</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
“ sp.	...	-	-	-	-	-	-	-	-	-	-
<i>Limarca angustifrons</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Pectunculus cainozoicus</i> , T. Wds.	...	2	3	-	-	6	-	8	-	-	-
“ <i>lenticularis</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Arca</i> ( <i>Fossularca</i> ) <i>equidens</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
“ “ <i>dissimilis</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
“ <i>pseudonavicularis</i> , Tate	...	-	2	-	-	-	-	-	-	-	-
<i>Plagiarca cainozoica</i> , Tate	...	passim	-	-	-	-	-	-	-	-	-
<i>Barbatia limatella</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Cucullaea Adelaidensis</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Crassatella aphrodina</i> , non	...	-	-	-	-	-	-	-	-	-	-
“ <i>communis</i> , Tate*	...	-	2	3	4	-	6	7	8	9	10
“ <i>corrugata</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Mytilicardia alata</i> , Tate	...	-	-	3	-	-	-	-	-	-	-
“ <i>curta</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Cardita latissima</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Carditella lamellata</i> , Tate	...	-	-	-	5	-	-	-	-	-	-
“ <i>radiata</i> , Tate	...	1	-	3	-	6	-	-	-	-	-
“ <i>rugosa</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Chama lamellifera</i> , T. Wds.	...	-	2	3	4	-	7	8	9	10	-
<i>Cardium monilitectum</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
“ <i>hemimeris</i> , Tate	...	-	-	-	4	-	-	8	9	-	-
<i>Chione cainozoica</i> , T. Wds.	...	1	2	3	4	-	-	8	9	10	-
“ <i>multitaeniata</i> , Tate †	...	1	-	3	-	-	-	-	-	-	-
<i>Meretrix tenuis</i> , Tate	...	1	-	3	-	-	-	-	-	-	-
<i>Dosinia imparistriata</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Tellina porrecta</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Myodora lamellata</i> , Tate	...	1	-	-	-	-	-	-	-	-	-
“ <i>tenuilirata</i> , Tate	...	-	-	3	4	-	6	7	8	9	10
<i>Thracia perscabrosa</i> , Tate	...	8	-	-	-	-	-	-	-	-	-
“ sp.	...	-	-	-	-	-	-	-	-	-	-
<i>Corbula pyxidata</i> , Tate	...	1	-	3	-	-	7	-	-	10	-
<i>Cuspidaria Adelaidensis</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
“ <i>latesulcata</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Saxicava australis</i> , Lam.	...	1	8	Recent	-	-	-	-	-	-	-
<i>Jouannetia cuneata</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
<i>Teredo Heaphyi</i> , Zittel	...	-	-	-	-	-	-	-	9	N.Z.	-
<i>Aspergillum teredina</i> , Tate	...	-	2	3	-	-	-	-	-	-	-
<i>Clavagella lirata</i> , Tate	...	-	-	-	-	-	-	8	-	-	-

## PALLIOBRANCHIATA.

<i>Terebratula Aldingæ</i> , Tate	...	N.Z.	-	-	-	-	-	-	-	-	-
“ <i>bulbosa</i> , Tate	...	-	-	-	-	-	-	-	-	-	-
“ <i>subcarnea</i> , Tate	...	-	-	-	-	-	-	-	-	-	-

\* *C. astartiformis* non *Nyst.*† *C. multilamellata* non *Br.*

<i>Terebratula vitreoides</i> , <i>T. Wds.</i>	-	2	3	4	-	-	7	8	9	10	11	-	
<i>Waldheimia fimbriata</i> , <i>Tate</i> ...	1	-	-	-	-	-	-	-	8?	-	-	-	
“ <i>furcata</i> , <i>Tate</i> ...	1	-	-	-	-	-	-	-	-	-	-	-	
“ <i>insolita</i> , <i>Tate</i> ...	1	-	3	4	-	-	6	7	8	-	10	11	12
“ <i>Johnstoniana</i> , <i>Tate</i>	-	-	-	-	-	-	-	-	-	-	-	-	[N.Z.]
“ <i>pectoralis</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>sufflata</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>Tateana</i> , <i>T. Wds.</i> ...	-	2	-	-	-	-	7	-	9	-	-	-	-
“ <i>Vincentiana</i> , <i>Tate</i> .	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Terebratella furculifera</i> , <i>Tate</i> .	N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>pentagonalis</i> , <i>Tate</i>	-	2?	-	-	-	-	-	-	-	-	-	-	-
“ <i>Tepperi</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Terebratulina catinuliformis</i> , <i>Tate</i> * ...	-	2?	3	4	-	-	-	-	9	-	-	12	-
<i>Terebratulina lenticularis</i> , <i>Tate</i>	-	2?	-	4	-	-	-	8	9	-	-	-	-
“ <i>Scouleri</i> , <i>Tate</i> ...	-	2	-	4	-	-	6	-	8	9	10	N.Z.	-
“ <i>triangularis</i> , <i>Tate</i>	1	-	-	-	-	-	-	-	-	-	-	-	-
“ sp. ...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Magasella compta</i> , <i>Sow.</i>	-	-	3	-	-	-	6	7	8	9	-	11	-
“ <i>deformis</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>Woodsiana</i> , <i>Tate</i> ...	1	2	-	-	-	-	-	-	8	9	-	-	12
“ sp. ...	-	-	-	-	-	-	-	-	-	-	-	-	[N.Z.]
<i>Rhynchonella squamosa</i> , <i>Hutton</i>	-	2	-	4	-	-	-	-	8	9	N.Z.	Rent.	-

## ECHINODERMATA.

<i>Cidaris Australiæ</i> , <i>Duncan</i> ...	1	-	-	-	-	-	-	-	9	-	-	-	-
“ 2 spp. ...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Salenia tertiaria</i> , <i>Tate</i> ...	...	...	...	...	...	...	...	...	...	...	...	...	...
“ <i>globosa</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Paradoxechinus novus</i> , <i>Laube</i> ...	-	-	3	-	-	-	-	-	8	9	-	-	-
<i>Psammechinus Woodsii</i> , <i>Laube</i>	-	-	3	-	-	-	-	-	8	9	-	-	-
<i>Fibularia gregata</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	8	9	-	-	-
<i>Cassidulus longianus</i> , <i>Gregory</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>Australiæ</i> , <i>D.</i> ( <i>Echinobrissus</i> )...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Echinolampas posterocrassus</i> , <i>Greg.</i> ...	-	-	3	-	-	-	-	-	-	-	-	-	-
<i>Echinobrissus Vincentinus</i> , <i>Tate</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Holaster Australiæ</i> , <i>Duncan</i> ...	1	-	3	-	-	-	-	-	-	9	-	-	12
<i>Cardiaster tertiaris</i> , <i>Gregory</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>latecordatus</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hemiaster planedeclevis</i> , <i>Greg.</i>	-	-	-	-	-	-	-	-	-	9	-	-	-
<i>Eupatagus cor-anguinum</i> , <i>Tate</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Meoma decipiens</i> , <i>Tate</i> ...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Maretia anomala</i> , <i>Duncan</i>	-	-	-	-	-	-	-	7	-	-	-	-	-
<i>Astrogonium</i> sp. ...	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pentacrinus</i> sp. ...	...	...	...	...	...	...	...	...	...	...	...	...	N.Z.
<i>Antedon</i> sp. ...	-	-	-	-	-	-	-	-	-	-	-	-	-

## ZOANTHARIA.

<i>Flabellum distinctum</i> , <i>Edw. &amp; H.</i>	1	-	3	-	-	-	7	-	-	-	-	-	-
<i>Notocyathus australis</i> , <i>Duncan</i>	-	-	3	-	-	-	6	7	8	9	10	-	-
“ <i>Aldingensis</i> , <i>T.</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>Wds.</i> ...	1	-	-	-	-	-	-	-	-	-	-	-	-
“ <i>Tateanus</i> , <i>T. Wds.</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Bistylia adherens</i> , <i>T. Wds.</i>	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Nomen mutand., *T. Davidsoni*, *Etheridge fils*, non *King*, 1871.



Trematotrochus fenestratus, <i>T.</i>							
<i>Wds.</i> ...	-	-	3	-	-	6	-
heterocostatus,							
<i>T. Wds.</i> ...	-	-	-	-	-	-	-
Amphihelia zic-zac, <i>T. Wds.</i> ...	-	-	-	-	-	-	-
striata, <i>T. Wds.</i> ...	-	-	-	-	-	-	-
Conosmilia contorta, <i>T. Wds.</i> ...	-	-	-	-	-	-	-
Cyathosmilia laticostata, <i>T.</i>							
<i>Wds.</i> ...	-	-	-	-	-	-	-
tenuicostata, <i>T.</i>							
<i>Wds.</i> ...	-	-	-	-	-	-	-
Cladocora contortilis, <i>T. Wds.</i> ...	-	-	-	-	-	-	-
Graphularia senescens, <i>Tate</i> ...	-	-	3	-	-	-	-

## CHAPTER II.

## TABLE CAPE, TASMANIA.

This section has been so fully described by Johnston, "Geol. Tasm." that after a visit of inspection little can be added. But it is noteworthy that the bed richest in fossils is the basal one, or Crassatella-bed; the overlying Turritella-bed, so called from its profusion of two small species of that genus, shows a remarkable poverty in species, while all, except the few echinoderms, are common to the Crassatella-bed. A gradual diminution in species and individuals arrests the attention as we rise in the section, so that at last the top of the Turritella-bed shows barrenness, and merges into unfossiliferous beds. No stratigraphical interruption from base to summit can be observed.

The Turritella-bed has acquired exceptional interest from the fact that it has furnished the remains of a marsupial, and therefore the most ancient as regards Australia. The study of the block stone containing this unique fossil does not permit of an explanation of its occurrence other than that of its embedment in original soft sediment.

The Table Cape section thus presents most pronounced littoral deposits, gradually merging into a lacustrine formation.

We append a list of fossils revised from that given by Mr. Johnston, and have indicated those for whose denomination we hold ourselves responsible; and until actual comparison with the Aldinga types be made it will not be safe to accept those alleged to be in common with restricted species of the Aldingian basin.

Mr. Pritchard's paper on "Table Cape Fossils" only reached us a few days before this paper was read, so that its critical consideration is deferred; but it may be stated that Mr. Atkinson's collection, which forms the basis of Mr. Pritchard's report, was studied and named by one of us in 1893, when on a visit to Table Cape, though it is evident that gentleman has since increased his

collection by the addition of the smaller species of Mollusca, as then urged upon him.

We catalogue 303 species from the Table Cape beds, summarised as follows:—

Zoantharia	...	...	...	...	...	21
Echinodermata	...	...	...	...	...	8
Crustacea	...	...	...	...	...	1
Mollusca	{	Paliobranchiata	...	...	...	18
		Lamellibranchiata	...	...	...	75
		Scaphopoda	...	...	...	3
		Gastropoda	...	...	...	170
		Cephalopoda	...	...	...	1
Pisces	...	...	...	...	...	4
Mammalia	...	...	...	...	...	2

The Polyzoa and Foraminifera are not included in our list.

Eight species of Mollusca out of the above total of 267 are recorded as still living, viz., *Rhynconella squamosa*, *Myodora brevis*, *Chamostrea albida*, *Limopsis aurita*, *L. Belcheri*, *Pectunculus laticostatus*, *Ostrea hyotis*, *Dentalium lacteum*, and the proportion of recent species is therefore 3 per cent.

By excluding *Pectunculus laticostatus* and *Limopsis aurita* from the list, for reasons subsequently given, this percentage will be reduced to 2.2.

#### LIST OF TABLE CAPE FOSSILS.

Being Addenda and Corrigenda to List in Johnston's Geology of Tasmania, 1888, pp. 229 et seq. ! Species studied. \* Type Specimens from Table Cape.

##### ZOANTHARIA.

- ! Trematotrochus fenestratus, *T. Wds.*
- Notocyathus viola, *D.*
- “ excisus, *D.*

##### DELTOCYATHUS ITALICUS, *Edw. and H.*

- Ceratotrochus McCoyi, *D.* (fide *T. Wds.*, R. S. T., 1876, p. 17)
- Antillia lens, *D.*
- ! Flabellum Victoriae, *D.*
- ! “ pedicellare, *Tate*
- \* “ Duncani, *T. Wds.*
- ! “ CANDEANUM, *Edw. & H.* (coll. E. D. Atkinson! F. distinctum apud Pritchard)
- ! Placotrochus elongatus, *D.*
- ! “ deltoideus, *D.*
- ! Conosmilia anomala, *D.*
- ! “ striata, *D.*
- \* Heliastrea Tasmaniensis, *D.*
- \* Thamnastrea sera, *D.*
- \* “ Tasmaniensis, *D.*

##### Paleoseris Woodsii, *D.*

- \* ! Astrangia tabulosa, *Tate*
- \* ! Dendrophyllia epithecata, *D.* (syn. *D. Duncani*, *T. Wds.*)
- ! Balanophyllia Australiensis, *D.*

##### ECHINODERMATA.

- Cidaris, sp.
- ! Echinolampas posterocrassus, *Greg.?* (Hobart Mus. ! specimens crushed or ill-conditioned)
- ! Eupatagus Murrayanus, *Larube?* (Hobart Mus ! specimens crushed or ill-conditioned)
- Lovenia Forbesi, *T. Wds.* (coll. E. D. Atkinson! var. minor; var. Etheridgei.)
- \* ! Conoclypeus rostratus, *Tate* (Micraster brevistella, Hobart Mus. !)
- ! Fibularia gregata, *Tate*
- \* ! Monostychia Etheridgei, *Johnst.*
- Schizaster abductus, *Tate* (coll. E. D. Atkinson.)

## CRUSTACEA.

! *Balanus amphitrite*, *Darwin*  
(coll. R. M. Johnston !)

## PALIOBRANCHIATA.

\* ! *Terebratula vitreoides*, *T. Wds.*  
! " sp.  
\* ! *Waldheimia Tateana*, *T. Wds.*  
! " *Garibaldiana*,  
*Davidson*  
" *furcata*, *Tate*  
" *Johnstoniana*, *Tate*  
! " *grandis*, *T. Wds.*  
" *Taylori*, *Eth.*  
" *Corioensis*, *McCoy*  
" *pectoralis*, *Tate?*  
! *Terebratulina Scouleri*, *Tate*  
(coll. E. D. Atkinson !)  
" *catinuliformis*,  
*Tate*  
" *lenticularis*, *Tate?*  
" *triangularis*, *Tate*  
*Terebratella Tepperi*, *Tate*  
\* " *Woodsii*, *Tate*  
! *Magasella Woodsiana*, *Tate*  
(coll. E. D. Atkinson !)  
! *RHYNCHONELLA SQUAMOSA*, *Hut-*  
*ton*

## LAMELLIBRANCHIATA.

! *Aspergillum teredina*, *Tate* (A.  
sp., coll. R. M. J. !)  
! " *liratum?*  
! *Teredo* sp.  
\* ! *Solecortus Legrandi*, *Tate*  
! *Panopaea Agnewi*, *T. Wds.*  
! " *orbita*, *Hutton* (Coll.  
E. D. A. !)  
! *Corbula ephamilla*, *Tate*  
! " *pyxidata*, *Tate*  
! *Zenatiopsis angustata*, *Tate* (coll.  
E. D. A. ! *Hebart Mus.* ! syn.  
*Z. fragilis*, *Pritchard*)  
! *MYODORA BREVIS*, *Stutchbury*  
(*M. æquilateralis*,  
*Johnston* !)  
! \* " *australis*, *Johnst.*  
! *Mactra Howchiniana*, *Tate*  
(juvenile example)  
! *Phragmorisma anatinaeformis*,  
*Tate*  
! *Psammobia aequalis*, *Tate*  
" *Hamiltonensis*, *Tate*  
! \* *Tellina cainozoica*, *T. Wds.*  
! " *Masoni*, *Tate*, var.  
! \* *Chione Allporti*, *T. Wds.*  
! \* " *hormophora*, *Tate*

! *Chione dimorphophylla*, *Tate*  
(coll. E. D. A. !)  
! \* " *cainozoica*, *T. Wds.*  
! \* " *propinqua*, *T. Wds.*  
! " *multitæniata*, *Tate* (coll.  
E. D. A. !)  
! *Meretrix eburnea*, *Tate* (syn. *M.*  
*tenuis*, *Pritchard*, non  
*Tate*)  
! " *submultistriata*, *Tate*  
! \* *Dosinia Johnstoni*, *Tate* (syn. *D.*  
*densilineata*, *Pritch.*)  
! \* *Cardium septuagenarium*, *Tate*  
! " *hemimeris*, *Tate*  
! \* *Chama lamellifera*, *T. Wds.*  
! *CHAMOSTREA ALBIDA*, *Lk.* (syn.  
*C. crassa*, *Tate*)  
! \* *Lucina planatella*, *Tate*  
! \* *Diplodonta subquadrata*, *Tate*  
! " *suborbicularis*, *Tate*  
! \* *Crassatella oblonga*, *T. Wds.*  
! \* " var. *aphrodina*, *T.*  
*Wds.*  
! " *communis*, *Tate* (syn.  
*C. astartiformis*,  
*Tate*, non *Nyst*)  
! \* *Mytilocardia platycostata*, *John-*  
*ston*  
*Carditella lamellata*, *Tate*  
*Cardita trigonalis*, *Tate*  
! \* " *gracilicostata*, *T. Wds.*  
! \* " *Tasmanica*, *Tate*  
" *scabrosa*, *Tate* (fide  
*Pritchard*)  
! *Trigonia semiundulata*, *McCoy*  
! \* *Nucula Tenisoni*, *Pritchard* (syn.  
*N. tumida*, *T. Wds.*,  
non *Hinds*)  
! \* " *Atkinsoni*, *Johnst.*  
! \* " *fenestralis*, *Tate*  
! *Nuculana Huttoni*, *T. Wds.*  
! " *prælonga*, *Tate*  
! \* " *crebrecostata*, *T. Wds.*  
! " *Woodsii*, *Tate*  
! " *apiculata*, *Tate*  
*Arca pseudonavicularis*, *Tate*  
! *Barbatia celleporacea*, *Tate*  
! " *limatella*, *Tate*  
! *Cucullæa Corioensis*, *McCoy*  
! \* *PECTUNCULUS cainozoicus*, *T.*  
*Wds.*  
! " *LATICOSTATUS*, (*P.*  
and *G.?* (syn. *P.*  
*McCoyii*, *John-*  
*ston*)  
! *LIMOPSIS AURITA*, *Brocchi?*  
! " *BELCHERI*, *Ads. & Rv.*

- ! *Modiola* n. sp.  
! *Crenella globularis*, *Tate*  
! *Spondylus pseudoradula*, *McCoy*  
(Hobart Mus. !)  
! " *gæderopoides*, *McCoy*  
(coll. E. D. A. !)  
!\* *Lima Bassii*, *T. Wds.* (syn. *L. squamosa*, *T. Wds.*)  
! *Limatula Jeffreysiana*, *Tate*  
! " *crebresquamata*, *Tate*,  
*m.s.*  
!\* *Limea transenna*, *Tate*  
! *Pecten Foulcheri*, *T. Wds.*  
! " *Hochstetteri*, *Zittel*  
! " *polymorphoides*, *Zittel*  
! " *Yahlensis*, *T. Wds.* (coll.  
E. D. A.!, Hob. Mus. !;  
*P. lucens*, *Johnston*,  
non *Tate*)  
! *Amussium Zitteli*, *Hutton*  
! *Placunanomia sella*, *Tate*  
! *Dimya dissimilis*, *Tate*  
! *OSTREA HYOTIS*, *Sow.?* (Hobart  
Mus. !)

## SCAPHOPODA.

- ! *DENTALIUM LACTEUM*, *Desh.*  
! *Entalis Mantelli*, *Zittel*  
! " *subfissura*, *Tate* (Hobart  
Mus. !)

## GASTROPODA.

- !\* *Murex Eyrei*, *T. Wds.*  
\* " *Legrandi*, *Johnst.*  
! " *velificus*, *Tate* (coll. E. D.  
Atkinson !)  
! " *irregularis*, *Tate*  
! " *camplytropis*, *Tate*  
! *Pseudomurex* sp.  
! *Rapana aculeata*, *Tate* (coll. E. D.  
Atkinson !)  
!\* *Typhis McCoyi*, *T. Wds.*  
!\* *Ricinula purpuroides*, *Johnst.*  
!\* *Lampusia Abboti*, *T. Wds.*  
! " *tortirostris*, *Tate*  
! " *crassicostata*, *Tate*  
!\* *Epidromus tasmanicus*, *Johnst.*  
\* *Trophon Selwyni*, *Pritchard*  
!\* *Fusus Meredithæ*, *T. Wds.*  
!\* " *Johnstoni*, *T. Wds.*  
! " *dictyotis*, *Tate*  
! " *craspedotus*, *Tate* (F. pa-  
godoides, *McCoy m.s.*,  
Hob. Mus. !)  
! " *foliaceus*, *Tate* (Hob.  
Mus. !)  
!\* *Clavilithes Tateanus*, *T. Wds.*  
! *Fasciolaria decipiens*, *Tate*

- ! *Latirofusus* sp.  
!\* *Siphonalia Roblini*, *T. Wds.*  
! *Sipho* n. sp.  
!\* *Peristernia transenna*, *T. Wds.*  
" *Aldingensis*, *Tate*  
(fide *Pritchard*)  
" *Murrayana*, *Tate*, var.  
(fide *Pritchard*)  
!\* " *affinis*, *Tate*  
" *semiundulata*, *Pritchard*  
(*P. rudis*, *Tate*  
*m.s.*)  
\* *Tritonidea minuta*, *Johnston*  
(*Murex*)  
!\* *Cominella fragilis*, *T. Wds.*  
(*Buccinum*)  
!\* *Phos liræcostatus*, *T. Wds.*  
(*Cominella*)  
\* *Pyrula altispira*, *Pritchard* (coll.  
E. D. Atkinson !)  
\* *Lyria semiactucostata*, *Pritchard*  
(coll. E. D. Atkinson)  
\* *Voluta Agnewi*, *Johnst.*  
\* " *Allporti*, *Johnst.*  
!\* " *McCoyi*, *T. Wds.*  
\* " *lirata*, *Johnst.*  
\* " *Stephensi*, *Johnst.*  
\* " *pellita*, *Johnst.*  
\* " *Tateana*, *Johnst.*  
" *anticingulata*, *McCoy* (*V.*  
*antiscalaris*, " *Geol.*  
*Tasm.*, " t. 30, f. 5)  
" *antiscalaris*, *McCoy* (coll.  
E. D. Atkinson !)  
\* " *strophodon*, *McCoy*  
" *ancilloides*, *Tate*  
" *Mortoni*, *Tate*  
\* " *Weldii*, *T. Wds.*  
" *Halli*, *Pritchard*  
" *Spenceri*, *Pritchard*  
" *Atkinsoni*, *Pritchard*  
\* *Mitra anticoronata*, *Johnst.*  
!\* " *dictua*, *T. Wds.*  
" n. sp. (aff. *M. othone*,  
*T. Wds.*)  
\* *Marginella Wentworthi*, *T. Wds.*  
\* " *strombiformis*, *T. Wds.*  
\* " *octoplicata*, *T. Wds.*  
\* *Erato duplicata*, *Johnst.*  
" *minor*, *Tate?*  
! *Ancillaria hebera*, *Hutton* (*A.*  
*mucronata*, *T. Wds.*,  
*Johnston*, non *Sow.*)  
! " *pseudaustralis*, *Tate*  
(coll. E. D. Atkinson !)  
!\* *Columbella Oxleyi*, *T. Wds.*  
!\* " *cainozoica*, *T. Wds.*  
!\* *Cancellaria Etheridgei*, *Johnst.*

- \* *Terebra simplex*, *T. Wds.*  
 ! \* " *additoides*, *T. Wds.*  
 \* *prægracilicostata*, *Pritch.*  
 ! \* *Surcula Johnstoni*, *T. Wds.*  
 ! \* " *paracantha*, *T. Wds.*  
 ! \* " *pullulascens*, *T. Wds.*  
 \* " *Wynyardensis*, *Pritch.*  
 ! \* *Drillia sandleroides*, *T. Wds.*  
 \* " *crenularoides*, *Pritch.*  
 ! " *n. sp.*  
 \* *Daphnella cancellata*, *T. Wds.*  
 ! \* " *columbelloides*, *T. Wds.*  
 ! \* " *gracillima*, *T. Wds.*  
 ! \* " *tenuisculpta*, *T. Wds.*  
 ! *Mangilia*, *n. sp.*  
 ! " *n. sp.*  
 ! " *n. sp.*  
 \* *Mangilia* (?) *gracilirata*, *T. Wds.*  
 (Hobart Mus.)  
 ! \* *Thala* (?) *marginata*, *T. Wds.*  
*Conus complicatus*, *Tate* (coll.  
 E. D. Atkinson !)  
 ! \* *Cypræa Archeri*, *T. Wds.*  
 ! " *subsida*, *Tate*  
 ! \* " *eximia*, *G.B.S.* (coll. E.  
 D. Atkinson !)  
 " *platypyga*, *McCoy* (coll.  
 E. D. Atkinson !)  
 " *consobrina*, *McCoy* (coll.  
 E. D. Atkinson !)  
 " *platyrhyncha*, *McCoy*  
 (Hob. Mus. !)  
 " *ovulatella*, *Tate* (fide  
 Pritchard)  
 " *sphaerodoma*, *Tate* ? (fide  
 Pritchard)  
 " *leptorhyncha*, *McCoy*  
 ! *Trivia avellanoides*, *McCoy*  
 ! \* *Semicassis sufflata*, *T. Wds.* (syn  
*S. transenna*, *Tate*)  
 ! *Cassidaria gradata*, *Tate* (*C. retic-*  
*ulospira*, *McCoy*, *m.s.* in Hob.  
 Mus !)  
 ! *Natica subNoë*, *Tate*  
 ! \* " *polita*, *T. Wds.*  
 ! \* " *vix-umbilicata*, *T. Wds.*  
 ! \* " *Wintlei*, *T. Wds.*  
 ! *Calyptrea subtabulata*, *Tate.*  
 (*Trochita calyptreiformis*, syn.  
*Pileopsis navicelloides*)  
 ! \* *Calyptropsis umbilicata*, *Johnst.*  
 ! \* *Crepidula Hainsworthi*, *Johnst.*  
 ! \* *Scalaria inornata*, *Tate*  
 ! " *foliosa*, *Tate*  
 ! *Crossea princeps*, *Tate*  
 ! " *sublabiata*, *Tate*  
 ! \* *Turritella Sturtii*, *T. Wds.*  
 ! \* " *Warburtoni*, *T. Wds.*  
 ! \* *Turritella tristira*, *Tate*  
 ! \* " *Murrayana*, *Tate*  
 ! " *conspicabilis*, *Tate*  
 (fide Pritchard)  
 ! \* *Tenagodes oculusus*, *T. Wds.*  
 ! \* *Thylacodes conohelix*, *T. Wds.*  
 ! " *rudis*, *Tate*  
 \* *Odostomia Roberti*, *T. Wds.*  
 \* " *polita*, *Johnst.*  
 \* " *microlirata*, *Johnst.*  
 ! \* " *puteolata*, *Pritchard*  
 (Actæon)  
 \* *Pyramidella sulcata*, *Johnst.*  
 ! " *n. sp.*  
 \* *Turbonilla pagoda*, *T. Wds.*  
 \* " *liraecostata*, *T. Wds.*  
 ! \* *Eulima* (*Leiostraca*) *Johnstoni-*  
*ana*, *Tate*  
 ! *Newtonia* *n. sp.*  
 ! \* *Bittium Johnstoni*, *T. Wds.*  
 (*Rissoina* and *Cerithiopsis*)  
 ! \* *Potamides semicostatum*, *Tate*  
 ! \* " *Wynyardense*, *Tate*,  
 (nom. mut. syn. *P.*  
*pyramidale*, *Tate*  
 non —)  
 \* *Rissoina concatenata*, *T. Wds.*  
 ! " *Mulderi*, *Tate*  
 ! " *n. sp.*  
 \* *Rissoa Stevensiana*, *T. Wds.* (*R.*  
*dubia*, *Johnst.* is the tip  
 of turreted shell of un-  
 certain genus)  
 ! \* " *Tateana*, *T. Wds.* (*Risso-*  
*ina*)  
 ! \* " *varicifera*, *T. Wds.* (*Risso-*  
*ina*)  
 ! " *3 n. spp.*  
 ! *Torinia Simsoni*, *Tate, m.s.*  
 \* *Adeorbis lævis*, *Johnst.*  
 \* *Liotia lamellosa*, *T. Wds.*  
 ! \* " *Roblini*, *T. Wds.*  
 ! \* *Delphinula gibbuloides*, *T. Wds.*  
 (*Torinia*; Hobart  
 Mus. !)  
 \* " *tetragonostoma*, *T.*  
*Wds.*  
 \* " *imparigranosa*,  
*Pritchard*  
 ! \* *Turbo Etheridgei*, *T. Wds.*  
 ! \* " *Atkinsoni*, *Pritchard*  
 ! \* *Astraliium Flindersi*, *T. Wds.*  
 ! \* " *ornatissimum*, *T. Wds.*  
 ! \* " *crassigranosum*, *T.*  
*Wds.* (*Gibbula*)  
 \* " *Hudsoniana*, *Johnst.*  
 (syn. *A. Johnstoni*,  
*Pritchard*)

- \* *Trochus Josephi*, *T. Wds.*  
 !\* *Gibbula æquisulcata*, *T. Wds.*  
 \* " *Clarkei*, *T. Wds.*  
 !\* " *crassigranosa*, *T. Wds.*  
     (part, junior)  
 \* *Calliostoma atoma*, *Johnst.*  
 \* " *Tasmanica*, *Johnst.*  
 \* " *Blaxlandi*, *Johnst.*  
 \* " *latecarina*, *Pritch.*  
 !\* *Cantharidus alternatus*, *T. Wds.*  
     (*Thalotia*)  
 !\* *Euchelus Woodsii*, *Johnst.*  
 !\* *Margarita Keckwicki*, *T. Wds.*  
     *Fissurellidæa malleata*, *Tate*  
 !\* *Emarginula transenna*, *T. Wds.*  
 \* *Tugalia crassireticulata*, *Pritch.*  
     *Haliotis ovinoides*, *McCoy* (fide  
     Pritchard)  
 ! *Actæon scrobiculatus*, *T. Wds.*

- !\* *Ringicula lactea*, *Johnst.*  
 !\* *Cylichna Woodsii*, *Tate*  
 ! " sp.  
 ! *Volvulella* sp.  
 ! *Atys* sp.

## CEPHALOPODA.

*Aturia australis*, *McCoy*

## PISCES.

*Carcharodon angustidens*, *Ag.*

*Oxyrhina trigonodon*, *Ag.*

*Lamna elegans*, *Ag.*

- ! *Mylobates plicatilis*, *Davis*

## MAMMALIA.

- !\* *Zeuglodon brevispidatus*, *Tate*  
 Diprotodontoid marsupial (*Hobart Mus.*!)

## CHAPTER III.

## GENERAL REMARKS—HORIZONS OF THE EOCENE.

Regarding the main divisions of the Tertiary deposits of Southern Australia into Eocene, Miocene, and Pliocene there is little difficulty, the palæontological being confirmed by the stratigraphical evidence. The two latter groups are of comparatively limited development in the province, but the first named, besides being spread over a wide area, shows such variation in the faunal contents of the beds as to render their correlation no easy task. In our previous papers we have treated the Eocenes as a whole, without attempting further subdivision, the simple reason being that no satisfactory basis of classification presented itself.

That the beds in question are of Eocene age was discussed fully in Part I., and it may be added here that on this point there is unanimity among all observers who have given adequate attention to the subject. The chief argument relied on is the proportion of recent molluscan species, which nowhere exceeds  $3\frac{1}{2}$  per cent. As a fact the percentage is usually under 2, the only exception being in the Table Cape section with a record of from 2.2 to 3 per cent. of living species, so that a margin is left for what further researches may possibly disclose. In some beds the percentage is less than 1, and in others between 1 and 2, but it would be extremely unwise, as well as contrary to the practice of geologists, to form conclusions as to relative age on such minor variations as these, since they may depend upon the number of species collected, or upon other causes which need not be cited. As a convenient, though admittedly rough, means of classifying Tertiary strata, the percentage system may serve for distinguishing their broad divisions, but must necessarily fail when applied to the discrimination of minor zones of deposition, where the recorded variation does not exceed 1 or 2 per cent.

The actual number of species common to the respective beds can as yet be estimated approximately only. It is true that much material is on hand, the ranks of collectors having been strongly reinforced of late years, but as the critical examination of the Pleurotomidae, Trochidae, and some other families is but little advanced, the published lists are necessarily defective. Additional identifications are frequently made, but pending an opportunity for publishing they may remain in manuscript for a long time. The observations made in this and former papers are based upon the published lists as revised to date by our manuscript additions and corrections. We should be glad if these latter could be printed herewith, but there is a limit, not only to the time at our disposal, but also to the space allowed us in the Society's Transactions, and it must suffice to say at present that we shall take the earliest opportunity of furnishing revised tables of fossils.

By far the most prolific Eocene deposit in Australia is that at Muddy Creek with 649 species of mollusca, and, as might be expected, representatives of many of them are found in all the beds. At Spring Creek, out of a total of 320 molluscan species on our lists, 127, or 40 per cent., occur also at Muddy Creek. In their latest paper\*, Messrs. Hall and Pritchard credit us with admitting that there are two zones on the Spring Creek cliffs, but, as a fact, we purposely abstained from expressing a decided opinion on the matter until fuller investigations had been made. Our remarks are too long for quotation, but their meaning is clear enough from the concluding words, which are as follows:—"We offer the *suggestion* that at this level, and above the echinoderm rock, a minor zone of the Eocene *may possibly* be demonstrated—at any rate the matter is worthy of further research." Our doubts as to the existence of two zones at Spring Creek are increased rather than diminished by the list of fossils quoted by these authors from the upper clays.

Amongst the 105 species enumerated from the clays, 40, or 38 per cent., are represented at Muddy Creek, and for the sake of comparison we will make a similar calculation for the species of the so-called lower beds. Seven species are recorded by us as confined to the strata overlying the echinoderm rock†, and deducting these from our total of 320 species for the general section, 313 are left as proper to the inferior strata, of which 124 are Muddy Creek species, giving a proportion of 40 per cent., which indicates a higher proportion of Muddy Creek shells in the lower than in the upper zone. And yet we are asked to believe that of these two zones it is the upper one which is more nearly allied to the Muddy Creek bed! We

\* Remarks on the proposed subdivision of the Eocene Rocks of Victoria. Proc. Roy. Soc., Vic., 1896.

† Correlation, &c., Pt. II., p. 119.

may add that we do not accept all the species noted by Messrs. Hall and Pritchard as restricted (for Spring Creek) to the upper clays, two or three of them having been found by us in the basal beds also. If there are really two zones at Spring Creek they must be very minor ones, the variations in their faunas being slight, and further collecting from both is advised before announcing definite conclusions as to their import.

For the fossils of the Lower Maud beds the same authors claim a similarity to those from Spring Creek, but we are unable to trace any special affinity between the two faunas. Their revised table of Maud fossils, just received,\* contains only 37 species of mollusca, but a collection made at the section by Mr. Mulder and one of us gives a total of 66. Of these, 33 species are represented at Muddy Creek, and 23 at Spring Creek, but 18 of the latter are also included amongst the Muddy Creek representatives. Of the five Spring Creek shells remaining, none are special to that section, and occur also in one or other of the extra-limital deposits. At least six of the species obtained by us are new and apparently restricted to this small exposure. The names and distribution of the Maud fossils on our list will be found in Appendix I.

At a higher level, and therefore probably overlying the fossiliferous strata, an outcrop of basalt is visible, which by the Survey is mapped as Older Volcanic. Messrs. Hall and Pritchard, in speaking of it, say, "there is, we now think, not sufficient evidence to suggest a subdivision of the volcanic rock,"† which means that they regard the Maud basalt as the equivalent of that which underlies the marine Eocenes of Flinders and Eagle Rock. We do not pretend to say without a fuller study of the Maud section whether this is the case or not, though the reported relations of the igneous rock to the accompanying sedimentary strata would lead to a different conclusion. Below the shell-beds, or littoral deposit, a polyzoal limestone appears, which, though of considerable thickness and easily separable from the overlying sandy beds, is not mentioned by Messrs. Hall and Pritchard in either of their papers. We have picked out pectens and other fossils from it, and observe that they are the ordinary ones yielded by such strata. Polyzoal limestone is also said to rest upon the Maud basalt, but the significance of this has yet to be worked out. The list of fossils from the Upper Maud beds given by Messrs. Hall and Pritchard cannot be appealed to, since most of the gastropods, it is stated, come from a deposit overlying polyzoal limestone, some miles distant. In their first paper great prominence was given to the argument that the Upper Maud and Waurin Ponds beds lie on the same horizon, and a comparative table of fossils was supplied to demonstrate their close affinity. In the lately

\* *Op. cit.*

† Older Tertiaries of Maud, &c. Proc. Roy. Soc., Vic., 1895.



issued article this view is entirely withdrawn, and with it, we presume, the interpretation placed upon the fossil evidence, since we are now told that the former deposit is younger than the latter; in fact, we are led to infer that, like the Spring Creek beds with which they are finally correlated,\* the Wauru Ponds limestones are overlain by the Older Basalt. Now, these limestones do lie immediately beneath basalt, but Messrs. Hall and Pritchard will certainly not contend that it is the older flow, as it covers also adjacent Eocene beds, which they still consider the youngest in the series. There is undoubted Older Basalt beneath the Eocene of Curlewis, a few miles from Wauru Ponds, and if it were present at the latter locality, which is apparently not the case, might we not also expect it to underlie the fossiliferous strata?

An exceedingly instructive outcrop of the Eocene has lately been worked at Birregurra by Mr. Mulder,† to whom we are indebted for examples of most of the fossils collected. Taken as a whole, the fauna belongs to the Muddy Creek type, but, curiously enough, includes also several species recorded hitherto only from Spring Creek, Table Cape, Cape Otway, or Aldinga Bay, amongst which may be quoted *Ancillaria ligata*, *Cancellaria Etheridgei*, *Voluta anticingulata*, *V. Halli*, *Isapis eothinos*, *Carditella lamellata*, *C. radiata*, *Cardium pseudomagnum*, *Chione Pritchardi*, *C. multistriata*, *Dosinia Johnstonei*. This intermingling in one section of shells usually considered to be characteristic of diverse faunas has an important bearing upon the correlation of the Eocenes, as will be seen in the sequel.

The beds at Shelford have so far yielded 201 species of mollusca, of which 143 occur also at Muddy Creek. The Schnapper Point and Bairnsdale deposits are probably of the same type, but the catalogues of species from them are too imperfect to allow of definite comparisons. The majority of the fossils in the Geelong beds (including Western Beach, Lower Moorabool, Curlewis-Belmont, and one or two others) are recorded also from Muddy Creek, while, though Spring Creek is in closer proximity to them than to the Birregurra section, they contain fewer representatives of its fauna. A possible explanation may be that, notwithstanding the greater distance, the configuration of the coast in Eocene times was such as to offer less obstruction to the migration of species between Spring Creek and Birregurra than between the former locality and Geelong.

Community with the fauna of Muddy Creek also obtains in the gastropod-bed of the Murray River, near Morgan, though the distance is so great.

Two of the most interesting deposits remain to be mentioned viz., those at Cape Otway and at the Gellibrand River, both on

\* *Op. cit.* Summary, page 166.

† Catalogue of Fossils from Birregurra, Geelong Naturalist, April, 1896.

the south coast of Victoria, and only about 25 miles apart, but nevertheless showing a most marked difference in their respective faunas. Out of 265 species of mollusca from the Gellibrand, 216, or 80 per cent., occur also at Muddy Creek, while of the 123 species recorded for Cape Otway, 44, or only 36 per cent., are Muddy Creek shells. On the other hand, 40 of the Cape Otway species, or one-third of the whole, are represented in the distant Aldinga section, while 18 of them are restricted to these two sets of beds. Though so close together, the outcrops of the Gellibrand and Cape Otway contain only 30 species in common! It may be added that lithologically they are alike, the strata in each locality consisting of mound-like masses of black mud, while both are similarly overlain by a Pleistocene rock. The Otway Eocenes are certainly underlain by mesozoic strata, but at the Gellibrand these suddenly disappear close to Pebbly Point, and are not met with again to the west on either the Victorian or South Australian coast. The proportion of recent species in the two deposits is practically identical, but owing to the comparatively small number of mollusca collected at Cape Otway, no special significance is attached to this circumstance. In Part II, when referring to the discordant facts of distribution disclosed in these sections, we said that the most reasonable explanation was that the beds were on different horizons. Corroborative stratigraphical evidence certainly cannot be adduced, but then the coastline between the two localities has not been closely examined. As will be seen, however, in the succeeding observations there are good grounds for deeming our previous conclusion correct.

From the great similarity between the Gellibrand and Muddy Creek fossils, we may infer a coastal connexion between the localities during the era of deposition. As was shewn in Part I, the beds are in reality continuous between the two areas. Farther west, between Portland and Muddy Creek a similar continuity of the Eocenes beneath a covering of basalt was pointed out some years ago.\* Outcrops of the same strata are visible also on the banks of the Glenelg River for fully 100 miles from its mouth, while in the County of Follett, from the sea coast as far as Apsley, and in the adjoining South Australian territory, from Mt. Gambier to Narracoorte and Border Town, the existence of Eocene deposits containing a similar type of fauna is abundantly revealed by numerous fossiliferous caves, as well as by the fossils obtained wherever wells have been sunk. That this whole region was thus one of practically contemporaneous deposition during the Eocene period will hardly be questioned. The resemblance of the fauna of the Murray River in South Australia, and of Shelford, Geelong, &c., in Victoria, to that of the same area has been already alluded to.

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\* Notes on the Muddy Creek beds, &c. Trans. Roy. Soc., S.A., 1888.

If we now examine the Eocene strata of Aldinga (and Adelaide) in the St. Vincent Gulf area of South Australia we observe, as shewn in the Table of Fossils published herewith, that amongst many of the old familiar Muddy Creek forms, a large number of new ones make their appearance—to such an extent, indeed, is this the case that the two faunas are really in marked contrast. Compared with the wide spread fauna of the Muddy Creek Eocene, that of Aldinga, as a whole, is much more restricted geographically, as, except at Cape Otway, few of its characteristic fossils are present in other deposits. From this fact alone it might perhaps be inferred that the Aldingian is the older of the two contrasted faunas, remnants of it only having survived to a later period. The recent discoveries made by Mr. Edwd. Clark, B.Sc., in the Ninety-Mile Desert of South Australia, already alluded to, and which are published in the present issue of the Society's Transactions tend to confirm this view. Having been allowed by the courtesy of the author to peruse the manuscript of his article we have little doubt concerning the correctness of his conclusions, viz., that in all probability the inferior beds of Aldinga (and Adelaide) underlie the Mount Gambier and Murray River limestones, and consequently therefore the deposits we have correlated with them at Muddy Creek.

Amongst the various Eocene beds hitherto examined those at Muddy Creek and Aldinga exhibit the greatest diversity in their faunas, as, though they contain many species in common the restricted ones are specially numerous. Both have been well examined and may be regarded as typical representatives of the older and younger faunas respectively, with which, therefore, other Eocene sections can be well compared. With the notable exception of Cape Otway, the Muddy Creek type of fauna is conspicuous in most of the Victorian Eocene sections, that of Aldinga being feebly represented. The same remark applies to the Murray beds in South Australia, and also to those at Table Cape in Tasmania. In the case of some of the best known sections, the relative representation of the Aldingian fauna can be approximately estimated, and it is curious to note that the percentage of characteristic Aldinga shells present in them seems to decline from Cape Otway to Table Cape, Spring Creek, and Geelong, and thence westward to Birregurra, Camperdown, and Gellibrand R., along a former strait or channel, which, as will be shown later on, existed in the old Eocene sea.

Our estimate is arrived at by taking account of those Aldingian shells which have not so far been recorded from Muddy Creek, though they are represented in one or other of the intermediate outcrops. Only well authenticated species can be quoted, which, according to our records, number 46. The distribution of these is shown in the following table :—

## DISTRIBUTION.

FOSSILS in Aldinga Bay or Adelaide sections, not collected at Muddy Creek but occurring in other localities.

	Cape Otway.	Spring Creek	Table Cape.	Western Beach, Geelong.	Lower Maud.	Birregurra.	Camperdown	Gellibrand.
<i>Murex calvus</i> ...	*	.	.	.	.	.	.	.
“ <i>bifrons</i> ...	*	.	.	.	.	.	.	.
“ <i>prionotus</i> ...	*	.	.	.	.	.	.	.
“ <i>hypsellus</i> ...	*	.	.	.	.	.	.	.
“ <i>sublævis</i> ...	*	.	.	.	.	.	.	.
<i>Triton cribrus</i> ...	*	.	.	.	.	.	.	.
<i>Clavalithes incompositus</i> ...	*	.	.	.	.	.	.	.
<i>Voluta cribrosa</i> ...	*	.	.	.	.	.	.	.
<i>Ancillaria ligata</i> ...	.	.	.	.	.	*	*	.
<i>Cancellaria ptychotropis</i> ...	.	.	.	.	.	.	.	.
<i>Cypræa ovulatella</i> ...	.	.	.	.	.	.	.	.
<i>Erato pyrulata</i> ...	.	.	.	.	.	.	.	.
“ <i>australis</i> ...	.	.	.	.	.	.	.	*
<i>Scalaria pleiophylla</i> ...	.	.	.	.	.	.	.	.
<i>Torinia Simsoni</i> ...	.	.	.	.	.	.	.	.
<i>Turritella Aldingæ</i> ...	*	*	.	*	.	.	.	.
<i>Mesalia stylacris</i> ...	*	*	.	*	.	.	.	.
<i>Mathilda bicarinata</i> ...	.	.	.	*	.	.	.	.
<i>Lovenella triserrata</i> ...	.	.	.	.	.	.	.	.
<i>Triploca ligata</i> ...	.	.	.	.	.	.	.	.
<i>Bulimella callosa</i> ...	.	.	.	.	.	.	.	.
<i>Pecten Peroni</i> ...	.	.	.	.	.	.	.	.
“ <i>consobrinus</i> , var.	.	.	.	*	*	.	.	.
“ <i>Hochstetteri</i> ( <i>a</i> )	.	.	.	*	*	.	.	.
<i>Limopsis insolita</i> ...	.	.	.	*	*	.	.	.
<i>Dimya sigillata</i> ...	.	.	.	*	*	.	.	.
<i>Limatula polynema</i> ...	.	.	.	*	*	.	.	.
<i>Spondylus gæderopoides</i> ( <i>b</i> )	.	.	.	*	*	.	.	.
<i>Modiola</i> sp. (aff. <i>albicostata</i> )	.	.	.	*	*	.	.	.
<i>Leda leptorhyncha</i> ...	.	.	.	.	.	.	.	.
<i>Arca pseudo-navicularis</i> ...	.	.	.	*	†	.	.	.
<i>Barbatia limatella</i> ...	.	.	.	*	*	.	.	.
<i>Mytilicardia alata</i> ...	.	.	.	*	*	.	.	.
<i>Carditella radiata</i> ...	.	.	.	*	*	.	.	.
“ <i>lamellata</i> ...	.	.	.	*	†	.	.	.
<i>Chione multiteniata</i> ...	.	*	.	*	*	.	.	.
<i>Cytherea tenuis</i> ...	.	.	.	*	*	.	.	.
<i>Myodora lamellata</i> ...	.	*	.	*	*	.	.	.
<i>Corbula pyxidata</i> ( <i>c</i> ) ...	.	*	.	*	*	.	.	*
<i>Aspergillum teredina</i> ...	.	.	.	*	*	.	.	.
<i>Waldheimia furcata</i> ( <i>d</i> ) ...	.	.	.	*	†	.	.	.
“ <i>pectoralis</i> ...	.	.	.	*	†	.	.	.
“ <i>Johnstoniana</i> ...	.	.	.	*	*	.	.	.
<i>Terebratulina triangularis</i> ...	*	.	.	*	†	.	.	.
“ <i>lenticularis</i> ( <i>e</i> )	.	.	.	*	†	.	.	.
<i>Terebratella Tepperi</i> ...	.	.	.	*	†	.	.	.
Total species of Mollusca collected in each bed ...	123	320	267	109	66	165	91	265
Per centage distribution of typical Aldinga species...	19·5	6·9	5·6	4·6	4·5	4·2	2·2	1·5

OTHER OCCURRENCES:—(*a*) R. Murray; (*b*) Bairnsdale; (*c*) Cheltenham, Schnapper Point, Shelford, Moorabool Valley, Curlewis; (*d*) ? Curlewis, Upper Maud; (*e*) Geelong, R. Murray.

† Quoted on the authority of Mr. R. Johnston.

The species here enumerated are thus survivors of the more ancient fauna found intermingled with those characteristic of the later one, and where in any section the proportion of them is considerable, as at Cape Otway, its relatively low position in the Eocene series is probably indicated. For Spring Creek, Table Cape, &c., where the percentage of such forms is comparatively small, we hesitate to express a decided opinion, and prefer to wait for further evidence. In the absence of stratigraphical evidence, the subdivision of the Eocenes on palæontological grounds must be attempted with caution, the horizons apparently merging very gradually. It is quite possible that, like numerous other species known to be common to the whole series, some at least of those here tabulated may have existed continuously through the earlier and later periods. That they are either absent or sparingly represented in a particular deposit may depend upon other conditions, and notably of course upon geographical distance along the ancient coast line.

We may safely affirm that a widely different arrangement of the land and water areas formerly obtained in the Southern Ocean. To the north of Cape Otway there is an elevated region showing Mesozoic rocks only, which must have been either an island or a peninsula during the Eocene period, there being at Birregurra, Inverleigh, Shelford, Geelong, &c., on its northern margin a valley in which, as previously mentioned, deposits of the marine Eocenes occur. This valley extends to Port Phillip Bay and Western Port, where the high lands of the Gippsland Mesozoics intervene between the Tertiaries just mentioned and those in the east of the colony. That the Cape Otway ranges were separated from the mainland during the Tertiary period is an opinion advanced both by Mr. F. M. Krause\* and Mr. R. Murray. The latter gentleman further concludes that a strait formerly connected Port Phillip Bay with Warrnambool and Portland.†

On the coast line to the west of the Gellibrand River section no strictly littoral deposit of the Eocene is known either in Victoria or the Mount Gambier area of South Australia, the outcrops showing mostly deeper sea forms. These are invariably of the younger type, the older beds being apparently entirely absent. The great thickness of the newer Eocene in this region is well illustrated by bores lately put down in the strata at Portland, which failed to pierce them at a depth of 2,265 feet! The idea was to reach the Mesozoic strata, which were supposed to underlie the limestone, in the hope of finding a coal seam. Most probably neither the Mesozoic nor the older Eocene ever existed in the locality.

\* Geol. Surv. of Victoria. Prog. Rep. No. 1, page 101.

† Geology and Phys. Geography of Victoria, pp. 120-1-2.

Allusion has already been made to the presence of restricted species in many of the sections. A distinction should be made in this respect between the molluscan beds and those containing mostly deeper sea forms, as it is from the former that such species have been principally recorded. The latter consist chiefly of limestones and polyzoal rocks, and the suddenness with which these occasionally replace the more littoral deposits has been frequently remarked upon. The relation of the two sets of strata is often puzzling, and they have, in fact, been arranged by separate authors in exactly reversed sequence. At Muddy Creek, as well as on the Glenelg and Murray Rivers, the shell beds merge rapidly into polyzoal rock, and their contemporaneous deposition is thus scarcely open to doubt. Close to Geelong the evidence is conflicting, since, though both classes of strata alternate, the limestone underlies at Belmont and in the Lower Moorabool, while higher up the same river, in the Maud section previously referred to, a thin littoral deposit rests upon one polyzoal rock, and is said to be overlain by another, with basalt intervening. At Spring Creek, however, which is 13 miles south of Geelong, our observations certainly indicate a contemporaneous origin for the two sets of strata. In this section the restricted forms are numerous, which fact alone seems to point to its comparative isolation during the era of deposition, or, in other words, to its separation from the neighbouring land by tolerably deep water, the result being a colony or minor region of molluscan life, in which specialised forms might be expected to occur.

It must not be forgotten that the great bulk of the Australian Eocenes consists of these polyzoal rocks and limestones, with their deeper sea fauna, and when in the midst of them, species peculiar to the laminarian or littoral zone suddenly appear, it is difficult to resist the conclusion that the latter were deposited on the shores of an island. When older rocks are elevated above the adjoining Tertiaries, as is the case at Geelong, on the south coast of Victoria, in the valley of the Glenelg, and elsewhere, we may safely decide that they represent either islands or peninsulas in the ancient seas, and the occasional presence of restricted species among the ordinary ones perhaps demands no further explanation.

In the foregoing observations we have confined ourselves to broad outlines only. Many matters of detail, which naturally suggest themselves, cannot be discussed until our knowledge of the Tertiary areas is greatly increased. The questions raised, though deeply interesting, are confessedly difficult, and will perhaps not be finally settled for many years to come.

## APPENDICES.

## I.

## TABLE OF LOWER MAUD FOSSILS.

(Collected by Messrs. Dennant and Mulder.)

Name of Species.	Muddy Creek.	Spring Creek.	Other Occurrences (Verified by the Authors.)
GASTROPODA.			
<i>Pseudovaricia mirabilis</i> , <i>Tate</i> ...	*		
<i>Natica varians</i> ? <i>Tate</i> ...	-	-	Mioc. Muddy Creek, Gippsland.
“ <i>polita</i> , <i>Ten. Wds.</i> ...	*	*	
<i>Scalaria</i> n. sp. (aff. <i>S. echinophora</i> )			
<i>Turritella gemmulata</i> , <i>Tate</i> ...	*	*	
“ <i>acricula</i> , <i>Tate</i> , var. ...	*	-	Western Beach, &c.; Mioc. Gippsland.
<i>Thylacodes conohelix</i> , <i>Ten. Wds.</i>	-	*	Gellibrand; Lower Moor- abool; Table Cape.
“ <i>crateriusculus</i> , <i>Tate</i>	*	-	Fyansford.
<i>Tenagodes oculus</i> , <i>Ten. Wds.</i> ...	*	*	
<i>Rissoa</i> sp. ...	*	*	
<i>Liotia Roblini</i> , <i>Ten. Wds.</i> ...	*	*	
<i>Phasianella</i> sp. ...	*	-	Also Mioc. Muddy Ck.
<i>Turbo</i> sp. ...	*		
<i>Astralium</i> ? sp.			
<i>Collonia tæniata</i> , <i>Tate</i> , <i>m.s.</i> , (new sp.)			
<i>Gibbula</i> 2 spp.			
<i>Thalotia exigua</i> , <i>T. Wds.</i> ...	*		
“ sp.			
<i>Cantharidus</i> , sp. ...	?		
<i>Euchelus</i> sp.			
<i>Clanculus</i> sp. ...	*		
<i>Eumargarita</i> new sp. (aff. <i>E.</i> <i>strigata</i> )			
“ sp.			
<i>Solariella</i> sp.			
<i>Pleurotomaria</i> ? sp.			
<i>Emarginula</i> sp. (aff. <i>E. trans-</i> <i>enna</i> ) ...	*		
“ sp. ...	*		
<i>Chiton</i> sp.			
<i>Ringicula</i> sp.			
<i>Bulimella paucilineata</i> , <i>Tate m.s.</i>	*	*	
<i>Utriculus</i> sp. ...	*		
SCAPHOPODA.			
<i>Entalis subfissura</i> , <i>Tate</i> ...	*	*	

Name of Species.	Muddy Creek.	Spring Creek.	Other Occurrences (Verified by the Authors.)
LAMELLIBRANCHIATA.			
Teredo sp.			
Corbula pyxidata, <i>Tate</i> ... ..	-	*	Gellibrand; Moorabool Valley, &c.
Myodora tenuilirata, <i>Tate</i> ... ..	*	*	
Tellina n. sp. (aff. <i>T. porrecta</i> ) ...	*	*	
“ n. sp.	*	*	
Donax Dixoni, <i>Tate</i> ... ..	*	*	
Chione cainozoica, <i>Ten. Wds.</i> ... ..	*	*	
“ sp. (juv.)	*	*	
Dosinia Johnstonei, <i>Tate</i> ... ..	*	*	Birregurra; Table Cape; Mioc., Muddy Creek.
Chama lamellifera, <i>Ten. Wds.</i> ... ..	*	*	
Lucina leucomomorpha, <i>Tate</i> ... ..	*	*	
“ projecta? <i>Tate</i> (juv.) ... ..	*	*	
Mysia crepidulæformis? <i>Tate m.s.</i>	*	*	
“ sp.	*	*	
Mylitta sp.			
Cardita Maudensis, <i>Pritchard</i>	*	-	Western Beach; R. Murray.
“ scabrosa, <i>Tate</i> ... ..	*	-	Murray desert, Mioc. ?
Trigonia intersitans, <i>Tate</i> (1) ... ..	-	-	Mioc., R. Murray.
Barbatia crustata? <i>Tate</i> ... ..	*	-	
“ sp.	*	-	
Fossularca n. sp.	*	*	
Pectunculus cainozoicus, <i>Ten. Wds.</i>	*	*	
Limopsis insolita, <i>Sow.</i> ... ..	-	*	Birregurra; Aldinga.
“ Belcheri (Ad. & R.),	*	*	
“ <i>McCoy</i> ... ..	*	*	
Cucullæa Corioensis, <i>McCoy</i> ... ..	*	*	
Dimya dissimilis, <i>Tate</i> ... ..	*	*	
Lima Bassii, <i>Ten. Wds.</i> ... ..	*	*	Gellibrand; Mornington.
Pecten consobrinus, <i>Tate</i> , var. ...	-	*	Mioc., Aldinga.
“ Foulcheri, <i>Ten. Wds.</i> ... ..	*	*	
Anomia? sp.			
Ostrea sp.			
BRACHIOPODA.			
Waldheimia grandis, <i>T. Wds.</i> ... ..	-	-	Glenelg R.; R. Murray; Table Cape.
Magasella compta, <i>Sow</i> ... ..	*	*	
Crania quadrangularis, <i>Tate</i> ... ..	*	*	Waurm Ponds.
CRUSTACEA.			
Scalpellum sp.			
ECHINODERMATA.			
Monostychia australis, <i>Laube.</i> ... ..	-	*	R. Glenelg; R. Murray.
Echinus sp.			
Scutellina patella, <i>Tate</i> ... ..	*	*	
Fibularia gregata, <i>Tate</i> ... ..	*	-	R. Murray; Aldinga.
“ “ var.	*	-	

(1) Nomen mut., T. Tatei, Pritchard, non Holub &amp; Neumayr, 1882.



Name of Species.	Muddy Creek.	Spring Creek.	Other Occurrences (Verified by the Authors.)
ZOANTHARIA.			
Placotrochus elongatus, <i>Dunc.</i> ...	*	*	
Notocyathus australis, <i>Dunc.</i> ...	*	*	
“ excisus, <i>Dunc.</i> ...	*	*	
“ sp.			
Deltocyathus italicus, <i>Edw. &amp; H.</i>	-	*	R. Murray; Gellibrand; C. Otway; Rec., Sth. Aust. Gellibrand; Fyansford.
Ceratotrochus typus, <i>Seq.</i> ...	-	-	
Conocyathus sp.			
Sphenotrochus n. sp.			
Trochocyathus? sp.			
Cycloseris sp.			
Balanophyllia sp.			
Dendrophyllia? 2 spp.			
Graphularia senescens, <i>Tate</i> :	-	*	Cheltenham; Crawford R.

## II.

Messrs. Hall and Pritchard, in their latest paper, give a list of Eocene species at Muddy Creek recorded as living, which requires correction.

According to our records, the Eocene species at Muddy Creek passing to Recent are:—

1. RHYNCONELLA SQUAMOSA, *Hutton*. Comparison of actual specimens has yet to be made.

2. OSTREA HYOTIS, *Linn.* The identification awaits corroboration.

3. LIMOPSIS BELCHERI, *Ad. and R.*

4. CREPIDULA UNGUIFORMIS, *Lam.*

5. CAPULUS DANIELI, *Crosse*

6. HIPPONYX ANTIQUATUS, *Linn.* (*H. foliaceus*, *Q. and G.*).

7. DENTALIUM LACTEUM, *Deshayes*. The fossil has not yet been compared with the recent shell.

*Pectunculus laticostatus*, *Q. and G.*, so called, of the Eocenes of Tasmania and Southern Australia, is, in our judgment, a distinct species, and should be quoted as *P. McCoyi*, *Johnston*, though the differential characters relied upon by its author are based on misconception.

*Limopsis aurita*, *McCoy*, is not the European species, *vide* *Cossmann*.

*Saxicava arctica*, *Linn.* The prominent and spinulose posterior angle may indicate a distinct species from the living one, but a decision thereon must await further material, that already possessed being inadequate.

*Nucula tumida*, Ten. Wds., is not acknowledged as a recent species.

*Placunanomia Ione*, Gray. Messrs. Hall and Pritchard claim this as an Eocene species on our authority, and quote it as being so noted on page 20 of Dennant's "Notes on the Muddy Creek Beds." They are mistaken. It is there marked Y, which indicates the upper beds.

### III.

We desire to acknowledge the scientific candor with which Messrs. Hall and Pritchard have withdrawn some of their conclusions concerning the classification of the Eocenes in deference to the arguments advanced by us.

These authors, however, take exception to our figures regarding the number of species at Muddy Creek and Spring Creek respectively which pass up into the Miocene, and give others which, as they say, differ widely from those quoted. In reference to this matter we remark (1) that rare forms, or those concerning which there was likely to be a difference of opinion, were intentionally omitted; and (2) that the figures furnished by Messrs. Hall and Pritchard for Muddy Creek are apparently mainly derived from the 1888 list, which now needs considerable revision. In this connection we may also observe that a few minor errors appear in the distribution assigned to certain Muddy Creek species described in the Society's Transactions, which are hereby corrected as follows:—*Zenatiopsis angustata*, *Strigilla australis*, *Carditella polita*, *Mitra sordida*, *M. conoidalis* have been collected from the upper beds only; and *Chama lamellifera*, *Hinnites Corioensis*, *Hipponyx antiquatus* from the lower only. It may also be noted that *Nassa Tatei* is a derived shell in the Miocene, while, as the text shows, *N. crassigranosa* belongs to the upper deposit, the junction beds in which it was found, sparingly mixed with Eocene species, being partly remade ground.

By including the omitted species referred to, our quoted number of Eocene shells which pass up into the Miocene is thereby increased to 36 for Spring Creek and 46 for Muddy Creek; and taking Messrs. Hall and Pritchard's estimated total of 326 species for the former, and our own of 649 for the latter, the calculations show that the case was in reality understated by us, the revised figures giving 10·1 per cent. of Miocene shells present in the Spring Creek Eocenes, as against 7 per cent. in those of Muddy Creek. A list of these species will be given subsequently. It is withheld just now, pending an opportunity for consultation concerning the distribution of a few Muddy Creek fossils.

In our estimate we have taken account of those Eocene forms only which pass up to the Miocene, but we freely admit the propriety of extending the inquiry to the Pliocene, viz., to the Dry Creek and Limestone Creek beds.

NOTE ON A GENUS OF GRYLLIDÆ, NEW FOR SOUTH AUSTRALIA; AND DESCRIPTION OF A NEW SPECIES OF MYRMECOPHILA.

By J. G. O. TEPPER, F.L.S., &c.

[Read June 2, 1896.]

The Myrmecophilides form a tribe of the family of the Gryllidæ, or Crickets, and are divided by M. Saussure into four legions, with 11 genera and 40 species (Mel. Orth., vol. II., p. 455, &c.), to which Mons. Brunner adds the genus *Lissostrachelus* and six species, of which three are distributed among as many older genera, thus bringing up the totals to 12 and 46 respectively. These are distributed over all continents, only two species of one genus (*Calochilus*) being recorded from Australia, and one each of three other genera from New Caledonia, Tahiti, and Fiji respectively, but none endemic apparently.

The typical genus *Myrmecophila* comprises four species, viz., *M. acervorium*, L., S. Europe and N. Africa; *M. ochraceus*, Fisch. Sicily and Asia Minor; *M. dubius*, Saussure, Bitang (Malaysia?); and *M. Americanus*, Saussure, S. America; but none for Australia or its adjoining island regions. The genus is not only remarkable for the small size of its members, but also for the peculiar habit of living exclusively with and under the protection of particular species of ants.

Through the zeal and assiduity of A. Zietz, Esq., F.L.S., and Assistant-Director of the S.A. Museum, a pair of these minute crickets were secured on May 17th last among ants under large stones on a hillside near Adelaide, and placed under my care, when, on examination, they turned out to be a new species of the above interesting genus.

Both specimens were caught alive, although exceedingly nimble and active; but the male died soon after capture from injuries received. The female reached me alive next morning, and I kept her so for three days by moistening the inside of the cork stopper of the small glass tube with a little saliva daily and occasionally renewing the air by opening the same. The little creature seemed to like its strange fare and scarcely quitted the cork even while being turned about during inspection. The following description was drawn up from the fresh and living specimens:—

MYRMECOPHILA AUSTRALIS, sp. n.

Male. Pale brownish-ochreous, ovate, flattened above, very thinly and minutely sericeous, head (except vertex), underside, and legs mostly whitish. Antennæ slightly longer than the body,

base subglobose, pale, scape brownish, hirsute. Eyes distinct, minute, oval, obliquely behind and external of antennæ, covered by the margin of the pronotum, black.

Pronotum subglobose, incrassated foremargin produced behind as a small acute tooth merging into the median line, ferruginous, disk pale, hindmargin fuscous, with narrow pale border. Mesonotum and metanotum, also abdominal dorsal segments, bordered darkly behind.

Anterior and intermediary legs short and slender, hind legs about twice as long as the body, femora, tibiæ and tarsi nearly subequal, in length, pale. Hind femora ovate, about twice as long than wide, externally very convex, with a small protuberance before the middle near the upper margin; inferior margin ciliate, ridges terminating by distinct teeth; apex truncated, with a small, circular depressed area (resembling a tympanum), immediately beneath the insertion of the tibiæ, bearing a minute spinelet on its hindmargin (also present in the female but less perfectly); internal side of femora deeply concave.

Hind tibiæ slightly shorter than femora, subcompressed, upper margin concave, lower convex; lower external spur minute, straight, upper much larger, distinctly recurved; internal spurs very long, slightly decurved; upper margin with one external and two internal spines, ciliated.

Hind tarsi longer than tibiæ, very slender; first joint with three minute oblique spines and a longer terminal spur, second joint very short, third joint extremely slender and claws most minute.

Cerci about two-thirds of the length of the body, hirsute base thick, gradually tapering, apex acute, brownish ferruginous. Supra anal lamina transverse, very short, rotundate, smooth.

Female.—Resembling male, but larger and darker. Antennæ more and base less incrassated. Eyes more prominent, less obtected. Abdomen wider posteriorly, darker above and beneath. Hind femora shorter and rather less robust. Supra-anal lamina subtrigonal, transverse; a fine groove on either side of the middle when alive. Ovipositor rather stout, nearly half the length of the body; subcylindrical, pale, slightly contracted in the middle; apex forming two parallel acute spines, dark brown.

		Male.	Female.
Length of body ...	...	3 mm.	4 mm.
Width " ...	...	2 "	2.4 "
Length of hind legs ...	...	5.5 "	
Length of hind femora ...	...	2.2 "	2 "
Width of hind femora ...	...	1.5 "	1.3 "
Length of ovipositor ...	...	—	2 "

*Habitat.*—Hillsides near Adelaide, South Australia, under stones with ants.

When alive the insects are extremely active and nimble ; when at rest the antennæ are carried subhorizontally diverging outwards in an easy curve ; the femora are placed at an angle of 40—50° to the body, the tibiæ being adpressed to the inner upper margin and nearly parallel with it (not along the lower as is usually the case) the tarsus extending backwards in the same direction as the body. In this position the concavity of the inner side strongly resembles that of an outer ear, and suggests the idea of serving as an auditory organ together with the membranous plate at the apex. After death the body shrinks considerably and also becomes darker in color.

The species resembles the European one considerably, but differs in various details, such as size, the presence of eyes, the curved hind tibiæ, and having the spurs and spines of different form, &c.



## NEW AUSTRALIAN LEPIDOPTERA.

By OSWALD LOWER, F.E.S., &amp;c.

[Read June 2, 1896.]

## GEOMETRINA.

## HYDRIOMENIDÆ.

## ASTHENA PORPHYRETICA, n. sp.

Female, 22 mm. Head, thorax, antennæ, and abdomen ochreous grey. Abdomen with pairs of black spots on base of anterior segments; three posterior segments with one large spot on each. Forewings triangular, hindmargin bowed, oblique; ochreous grey, with dull purplish markings; numerous transverse narrow wavy lines, the confluence of which form a moderately broad band from beyond middle of costa to beyond middle of inner-margin; a black discal dot before this above middle; lines towards hindmargin more dense, and forming a suffused band; a hindmarginal row of black dots at extremities of veins; cilia ochreous grey. Hindwings with color and markings as in forewings, cilia as in forewings.

Two specimens in August at Rockhampton, Queensland. Nearest *xylocyma*, Meyr.

## BOMBYCINA.

## LIMACODIDÆ.

## DORATIPHORA EUCHRYSA, n. sp.

Female, 34 mm. Head, thorax, palpi, legs, and antennæ golden rufous; thorax more reddish, patagia reddish fuscous, abdomen reddish fuscous. Forewings moderately dilated, costa nearly straight, apex rounded, hindmargin obliquely rounded; bright brassy yellow; costal edge narrowly fuscous; a fuscous band starting from base and continued along inner-margin right round hindmargin to apex; a narrow, hardly waved line from costa just before apex to middle of inner-margin; cilia dark fuscous. Hindwings pale ochreous-reddish, with a darker line at base; cilia pale reddish-ochreous.

A very striking species, not like any other species known to me. Two specimens, in November, received from Mr. Rowland Turner, of Mackay, Queensland.

## LETHOCEPHALA (?) CALLIDESMA, n. sp.

Male, 32 mm. Head, abdomen, and legs reddish fuscous, tinged with darker fuscous; abdomen tinged with dark purplish-reddish on posterior half. Thorax deep purplish-fuscous, tinged with scarlet posteriorly; collar scarlet. Antennæ reddish, pectinations at greatest length four, gradually attenuated to apex, but not ending in a bristle. Forewings moderate, somewhat dilated posteriorly, costa almost straight, apex rounded, hindmargin obliquely bowed; deep reddish-fuscous, anterior half deep purplish-fuscous, separation well defined by an ochreous-white oblique, hardly sinuate line, from inner-margin at one-third to more than half across wing, then obscurely continued to just beneath costa at five-sixths; a dark fuscous, somewhat undulated line from apex of this streak to below middle of hindmargin; cilia reddish-fuscous. Hindwings with hindmargin rounded; reddish-fuscous, purplish tinged, becoming lighter towards costa; cilia as in forewings.

One specimen, Mackay, Queensland, in December. Not unlike *Lethocephala bombycoides*, Feld., but is shorter winged.

## DORATIPHORA EUMELA, n. sp.

Female, 28 mm. Head, palpi, legs, antennæ, and abdomen fleshy white; legs minutely irrorated with black. Thorax pale reddish-fuscous, with a short black longitudinal streak behind collar. Forewings moderately dilated, costa hardly arched, apex rounded, hindmargin bowed, oblique; pale fleshy-brown, more or less suffused with whitish, with scattered minute blackish scales; a somewhat quadrate shining-fuscous patch extending from base to near middle, reaching more than half across wing, edged posteriorly with a line of white, and containing a round sharply-defined black spot near base; a large whitish ill-defined somewhat suffused round patch near apex, partly edged anteriorly by a fine fuscous line, and containing near its posterior edge a suffused fuscous mark, on which are placed three dark fuscous-cuneiform spots on veins, the apices directed inwards. The mark is edged posteriorly by a line of whitish, indicating extreme edge of round spot; cilia fleshy-white, with a whitish basal line. Hindwings with hindmargin rounded; dull fuscous, tinged with reddish; cilia as in forewings.

One specimen from Mackay, Queensland; sent by Mr. Rowland Turner.

## ARCTIADÆ.

## SORCOSTIA NIPHOSTENA, n. sp.

Female, 20 mm. Head and thorax white. Legs fuscous whitish; palpi three, fuscous, internally white. Antennæ and abdo-

men fuscous whitish. Forewings elongate triangular; costa moderately arched; hindmargin obliquely rounded; fuscous, mixed with darker fuscous; tufts fuscous, basal third of wing whitish, becoming fuscous tinged above and below middle; a fine blackish irregularly dentate line, somewhat curved inwards indicating posterior boundary of basal patch, followed by a very broad fuscous fascia, anterior edge from before middle of costa to one-third of inner margin and bounded by the fine black line; posterior edge ill-defined and lost in general ground-color, excepting on lower two-thirds which is rounded by a fine black edged snow-white line, commencing at two-thirds of inner margin with two indentations below middle, and continued obliquely to more than two thirds across wing, thence suddenly angulated and ending in hindmargin above middle; in the angulation is a very dark fuscous patch with three teeth, the apices directed towards hindmargin; a snow-white streak from above second angulation to anal angle; a large black discal dot; cilia fuscous-whitish. Hindwings and cilia grey-whitish.

One specimen at Port Victor, South Australia, in November. Nearest *albalis*, Walk.

#### PYRALIDINA.

#### EPIPASCHIADÆ.

#### EPIPASCHIA LITHOCHLORA, n. sp.

Male, 30 mm. Head, thorax, palpi and legs pale-greyish ochreous, palpi more whitish beneath; legs dusted with white. Antennæ greyish-fuscous. Abdomen greyish. Forewings moderate, dilated posteriorly; costa hardly straight arched towards apex; apex round pointed; hindmargin bowed; oblique; pale-fawn, with three indistinct transverse fasciæ of pale ochreous, causing the color to appear ochreous-grey; a very pale ochreous basal patch (being indications of first fascia), outer edge irregular, from one-third of costa to one-third inner margin and containing a raised tuft which is tinged with reddish fuscous spot on costa at about one-half; a tuft of reddish fuscous obliquely confluent with it, from which proceeds a waved pale ochreous line to middle of inner margin, indicating second fascia; a fuscous-reddish spot on costa at about two-thirds; a pale ochreous fascia from costa at five-sixths to inner margin at anal angle, preceded on lower half by a well-defined curved patch of reddish-fuscous, becoming strongly dentate posteriorly on veins, and edged by a line of ground-color; veins somewhat blackish on this patch; cilia ochreous-grey, with a median line of small blackish dots; tips tinged with fuscous. Hindwings fuscous, becoming dark-fuscous round hindmargin, especially round apex; cilia white, chequered with black on basal half.



Three specimens bred by Mr. R. Illidge, near Brisbane, Queensland, in November.

*STERICTA* (?) *CALLIZONA*, n. sp.

Female, 38 mm. Head, palpi, antennæ, thorax, and abdomen purplish-fuscous; palpi very long. Legs purplish-fuscous; anterior and middle coxæ fleshy white. Forewings moderately dilated; costa nearly straight; arched towards apex; apex rounded; hindmargin obliquely rounded; fuscous, slightly purplish tinged; a broad white band starting from costa at base and continued obliquely to below middle of disc, thence suddenly curved to middle of inner margin; extremities suffused, edged throughout beneath with fine blackish line, and broadly above with olive-green, which color is inclined to be suffused with band; a small dark fuscous spot on band near base; a raised tuft of dark fuscous scales on inner margin at about a quarter, and another larger beneath costa about middle; a fleshy-white cuneiform mark on costa at four-fifths from anterior edge proceeds a fuscous line, dentate throughout, more strongly indented beneath costa and with a strong angulation outward above middle, anteriorly edged on upper half by a large fleshy-white patch containing a small spot of ground-color, and posteriorly by a suffused whitish line, more pronounced on upper half; an apical blackish patch containing two or three suffused fleshy-white spots; a row of obscurely whitish spots near parallel to hindmargin; cilia fleshy white, extremities blackish on basal half chequered with black and white. Hindwings dark fuscous; cilia as in forewings, but extremities more reddish.

One specimen from Mackay, Queensland, in December. The palpi of this are very long and quite a peculiar character. I am not sure if it is referred to its correct genus.

*STERICTA* *CHIONOPA*, n. sp.

Male, 30 mm. Head white, palpi fuscous. Thorax white with a broad fuscous longitudinal band, darkest posteriorly. Collar dark fuscous. Antennæ and legs dark fuscous, base of antennæ white beneath; all tibiæ and tarsi ringed with white. Abdomen ochreous, sides and anal tuft fuscous, whitish beneath. Forewings moderate, dilated posteriorly; costa nearly straight, arched towards apex, apex rounded, hindmargin obliquely rounded; snow-white, with dark fuscous markings; a large broad cuneiform spot on costa from near base to about a third; a very suffused irregular line from anterior edge of this spot to inner margin near base; an almost imperceptible line from posterior edge of cuneiform spot and continuous with it to inner margin near middle, interspace with a slight bluish tinge and sparsely irrorated with minute fuscous scales; an elongate mark on costa at about two-

thirds, below which is a well-marked discal spot ; a broad irregularly edged transverse band from costa at four-fifths to inner margin at three-quarters, containing a suffused spot of ground-color on inner margin ; a large roundish hindmarginal patch, darkest and well-marked on upper half, and nearly confluent with preceding band, and enclosing a prominent spot of ground-color on costa at five-sixths ; lower half of hindmarginal band strongly suffused with ground-color posteriorly ; the separation of transverse and hindmarginal bands is accomplished by a fine waved line of ground-color, which is split up into two spots on apical portion ; a hindmarginal row of black dots on hindmargin, strongly perceptible on lower half ; cilia fleshy-white, basal half chequered with black. Hindwings fuscous ; cilia grey-whitish with a darker fuscous line near base.

Two specimens taken at Railway Station electric light, Brisbane, Queensland, in December and January. A very unique looking insect.

STERICTA (?) STREPTOMELA, n. sp.

Female, 30 mm. Head, thorax, palpi, abdomen and legs dull fleshy-pink, densely irrorated with fine white scales. Abdomen with blackish segmental rings, that on the second segment being black. Forewings elongate-triangular, posteriorly dilated ; costa hardly straight, somewhat sinuate on anterior half ; hindmargin obliquely rounded ; dull fleshy-pink, densely irrorated with dull white scales so as to appear fuscous-whitish ; markings somewhat obscure ; a very ill-defined pale-fuscous line curved outwards from a quarter of costa to about a third of inner margin, a strongly defined black line from three-quarters of costa to just before anal angle, strongly dentate outwards and emitting four teeth in middle, thence with a very strong indentation inwards and continued as a thicker streak to before anal angle ; a suffused outwardly oblique mark on costa before middle, extremity forming an irregular discal dot, and nearly touching apex of indentation of last mentioned line ; a hindmarginal row of black dots ; cilia whitish, chequered with fuscous on basal half. Hindwings whitish-fuscous, becoming whitish towards base, and broadly fuscous round hindmargin ; cilia white with a fuscous basal line. Hindwings beneath shining with iridescent white, with a fuscous hindmarginal line, becoming attenuated on inner margin.

One specimen from Duaranga, Queensland, in December.

STERICTA LEUCODESMA, n. sp.

Male, 28 mm. ; female, 31 mm. Head and legs fuscous mixed with white ; middle and posterior tarsi ringed with white. Thorax fleshy-white, lighter posteriorly. Forewings elongate triangular ; costa straight ; hindmargin obliquely rounded ; dark fuscous, be-

coming more or less ochreous on median third; a somewhat curved moderately thick white line from just beyond one third of costa to about one third of inner margin, posteriorly edged by its own width of ground-color; a white spot (being indication of a second similar line) on costa at about two-thirds from which proceeds a fuscous dentate line to inner margin before anal angle, with three outward angulated teeth in middle; a blackish hind-marginal line, interrupted on veins by dull whitish points; cilia reddish fuscous, chequered with blackish and with a whitish basal line. Hindwings pale fuscous-grey, more fuscous tinged round hindmargin; cilia greyish, with a fuscous median line.

Four specimens near Bulimba, Queensland, also one at electric light at Railway Station, Brisbane, Queensland, in November, December, and January.

#### BOTYDIDÆ.

##### METALLARCHA CROCANTHES, n. sp.

Male, 25 mm. Head, palpi, thorax, and antennæ bright-yellow. Palpi fuscous above. Abdomen ochreous-yellow, with blackish segmental rings. Anal tuft ochreous-yellow. Legs ochreous yellow, anterior pair fuscous. Forewings moderate, elongate-triangular; costa hardly sinuate, apex tolerably rounded; hindmargin obliquely rounded; bright brassy-yellow, with leaden markings; a narrow streak along costa from base to near apex, attenuated at extremities, more so at base; a narrow, erect mark, reaching more than half across the wing, from inner margin before one-half; a rather thick outward curved mark from costa at about one-third to disc beyond middle, confluent at extremity with a moderately round discal dot; a moderate thick streak along hindmargin, attenuated at anal angle, and continued for a short distance along inner margin; cilia bright-yellow, with a few leaden scales round apex. Hindwings leaden-fuscous; cilia as in forewings.

One specimen received from Mr. E. Guest (who has taken others) at Hoyleton, South Australia, in March.

#### SCOPARIADÆ.

##### SCOPARIA ANTHOMERA, n. sp.

Male, 20 mm.; female, 23 mm. Head, thorax, palpi, antennæ, and legs fuscous. Palpi mixed with yellowish; tarsi ringed with yellow; posterior legs ochreous-yellow. Abdomen yellowish, more or less fuscous-tinged; anal tuft yellowish. Forewings moderate; costa nearly straight, apex rounded; hindmargin obliquely rounded, dark-fuscous, markings ochreous-whitish, irregularly edged with black; a roundish spot just above middle of wing at one-fourth; a pair, somewhat confluent, and similar

obliquely placed at about three-fifths, and in a line with first spot; a moderately suffused spot on inner margin beyond, strongly edged posteriorly with black; a short suffused spot on costa at about three-fourths, cut by a black line, which is angulated outwardly, and continued suffusedly to inner margin before anal angle; an indistinct yellowish suffusion along hindmargin, indistinctly intersected by veins, followed by a dot-like blackish hindmarginal line; cilia fuscous, with a blackish median line. Hindwings yellow, with a blackish hindmarginal band, broadest at apex, and finely attenuated towards anal angle; cilia fuscous, darker on basal one-half, and becoming ochreous-grey at and around anal angle.

One specimen at Norwood, South Australia, and one at Gawler, South Australia, in September.

*SCOPARIA HYPOXANTHA*, n. sp.

Female, 28 mm. Head, palpi, antennæ, and thorax fuscous; palpi whitish beneath. Legs ochreous, mixed with fuscous; posterior pair yellowish-ochreous. Abdomen greyish-ochreous. Forewings moderate; costa gently arched, apex obtuse; hindmargin obliquely rounded; fuscous, mixed with reddish and darker-fuscous; a rather suffused-white line from one-fourth of costa to beyond one-fourth of inner margin, preceded by a more or less suffused-whitish patch; a well-defined, irregular dentate, white line from about three-fourths of costa to about three-fourths of inner-margin, with a strong angulation outwards in middle; a hindmarginal series of obscure, elongate, blackish spots; cilia fuscous-whitish, basal half dark-fuscous. Hindwings with apex somewhat prominent; pale-yellow; a fuscous hindmarginal band, broadest at apex; an elongate fuscous discal spot, indistinct; cilia yellow, with a fuscous median line.

One specimen at Parkside, South Australia, in December, and one specimen from Mr. G. Lyell, of Gisborne, Victoria.

CRAMBIDÆ.

*TALIS CYCLOSEMA*, n. sp.

Male, 24 mm. Head, palpi, antennæ, and thorax dark ochreous-fuscous. Thorax with two fine longitudinal silvery lines; palpi beneath somewhat whitish. Antennal ciliations 2. Legs dark-ochreous; posterior pair dusted sparsely with white. Abdomen ochreous-whitish. Forewings moderate, elongate; costa gently arched; apex rounded; hindmargin obliquely rounded; dark ochreous-fuscous; a straight, silvery-white, longitudinal streak in middle of wing from base to middle of hindmargin, sinuate upwards at about three-fourths, and containing a well-marked black spot in situation; the streak is edged above throughout

with a blackish line, more perceptible posteriorly; a somewhat curved silvery-white streak, cutting through longitudinal streak, from apex to anal angle, attenuated towards anal angle; a fine waved, black, hindmarginal line, edged anteriorly with silvery-white; cilia ochreous-fuscous, mixed with whitish, more persistent around apex. Hindwings grey, tinged with fuscous towards apex; cilia grey-whitish, with a fuscous-dividing line, leaving a narrow strip of whitish at base.

Two specimens received from Mr. E. Guest, Hoyleton, South Australia. One specimen from Trafalgar, Victoria; taken in March. Nearest *acotophora*, Meyr., but apart from its smaller size, it may be best distinguished from that species by the darker ground-color, the antennal ciliations, and apical streak. At first sight not unlike *xylophœa*, Meyr.

#### PHYCIDIDÆ.

##### EUZOPHERA (?) PYRRHOPTERA, n. sp.

Male, 25 mm. Head, antennæ, palpi, and thorax dark fuscous-purple, somewhat mixed with whitish, palpi whitish internally; antennæ swollen towards base. Ciliations about  $\frac{1}{2}$ . Legs fuscous-purple, mixed with whitish, and with a tuft of whitish hairs on apex of joints; posterior pair reddish, all tarsi ringed with white. Abdomen coppery-reddish. Forewings moderate, costa strongly arched towards base, thence nearly straight; apex obtuse, hindmargin obliquely rounded, costa beneath with a fold or fringe of dark fuscous hairs edged with whitish, somewhat elliptical in shape, and extending from base to one-third; dark fuscous-purple, very finely irrorated with whitish; a moderately broad outwardly oblique whitish transverse fascia from about one-fourth of costa to one-third inner-margin, posterior edge bounded by a patch of very dark ground-color, which causes the fascia to appear prominent; an outwardly-curved pale flesh-colored line, containing a disconnected row of dark fuscous dots in centre, from beneath costa at about three-fourths to just before four-fifths of inner-margin; a very fine dark fuscous hindmarginal line, somewhat dot-like; cilia fuscous purple, tips whitish; a fuscous basal line separated by a line of whitish. Hindwings pale fleshy-pink, with a darker hindmarginal line; cilia fleshy-pink, with ochreous basal and fuscous subbasal line. Wings beneath fleshy-pink, excepting basal half of forewings above middle, which is fuscous purple.

One specimen at Brisbane, Queensland, in August. A very beautiful species. The curious fringe-like appendage is very noticeable, as is also the tufted tibiæ. Recalls a large *Ephestia* in general appearance.

## EUZOPHERA (?) THERMOCHROA, n. sp.

Female, 20 mm. Head ochreous yellow. Antennæ, palpi, thorax, legs, and abdomen dark fuscous; palpi and anterior portion of thorax coppery-fuscous, tarsi finely annulated with white. Forewings moderate, dilated posteriorly; costa gently arched, apex round pointed, hindmargin obliquely rounded, bluish white, an irregular dentate double black line, internal line darkest, from costa at one-third to inner-margin at half, containing a line of ground-color; an irregular line of blackish from three-fourths of costa to three-fourths of inner-margin, with two sharp angulations, one above middle and one beneath costa, edged posteriorly throughout with a line of its own width of bluish-white; an elongate black discal dot in middle of wing; area beyond posterior line somewhat reddish-tinged; a hindmarginal row of black dots; cilia fuscous, with a blackish line at base. Hindwings bright orange, apex infuscated; cilia yellow, on apex and upper-half of hindmargin blackish.

Distinct by the hind-wings. One specimen at Rose Bay, Sydney, N.S. Wales, in November, and one at Sandringham, Victoria.

## TORTRICINA.

## TORTRICIDÆ.

## ANISOGONA PLACOXANTHA, n. sp.

Male, 16 mm. Head, palpi, and thorax fuscous; palpi beneath ochreous-tinged. Legs and antennæ fuscous, posterior tibiæ ringed with whitish-ochreous, basal joint of antennæ ochreous. Abdomen fuscous, whitish beneath. Forewings moderately broad, costa gently arched towards base, apex nearly rectangular; hindmargin somewhat sinuate beneath apex; ochreous, brownish tinged, with deep chocolate markings; basal patch much lighter; outer edge of basal patch from one-fifth costa to one-fourth inner margin; central fascia broad, well-defined, anterior edge nearly straight from one-third of costa to before middle of inner margin; posterior edge from just beyond one-third of costa to just before anal angle; strongly contracted on costa and curved outwards on lower five-sixth; a well-defined elongate triangular patch on costa at four-fifths, lower extremity almost touching posterior edge of central fascia and enclosing a triangular spot of clear yellow on costa; a short cuneiform mark obliquely placed on hindmargin above anal angle, obsolete in some specimens; cilia light-ochreous fuscous. Hindwings grey, broadly suffused with fuscous or light-fuscous hindmargin; cilia greyish, fuscous at base.

This distinct and handsome species is not unlike a *Dichelia* in general appearance. The male specimen, although abraded, appears to have the tufted abdominal anal valves and short palpi, conse-

quently I refer it to *Anisogona*. According to description it differs from *similana* by the absence of the fuscous spots on costa at one-third and two-thirds and color of hindwings. The triangular yellow spot on costa is very conspicuous and enhances the beauty of the species. One specimen from Stawell, Victoria, and one from Gippsland, Victoria, taken in December and received from Mr. G. Lyell, jun., of Gisborne.

DICHELIA (?) AMEBEA, n. sp.

Female, 15 mm. Head, palpi, thorax, antennæ, and abdomen dark fuscous; palpi lighter internally. Abdomen whitish beneath. Legs whitish, externally somewhat infuscated. Forewings moderately broad, somewhat dilated posteriorly; costa gently arched, apex obtuse; hindmargin almost straight, hardly sinuate in middle; dull purplish-fuscous, strigulated with darker fuscous; ground color, becoming lighter towards hindmargin; a sharply defined pale flesh colored triangular blotch, extending on costa from middle to near apex and reaching nearly half across the wing; edged by a thick black shade almost its own width; on the lower extremity of patch is a fine irregular line of ochreous-white; several short oblique blackish lines on costal portion of patch; three or four short blackish marks above anal angle, an indistinct blackish mark on upper part of hindmargin; cilia grey, tips fuscous. Hindwings with hindmargin very slightly sinuate beneath apex; dark fuscous; cilia grey, with a dark fuscous median line.

This species, which is remarkably distinct, hardly seems referable to this genus. So far as can be made out, without dissection, both veins seven and eight appear to run to the *costa*, a character hitherto only known to occur in *Mictoneura*, Meyr. There is, however, no sign of any crest on the thorax, which at once removes it from that genus. The neuration of the hindwings is similar to *Dichelia*, consequently I refer it, until I obtain more material, to that genus, but not without some hesitation. I took one beautiful specimen at Brisbane ("Kedron Brook"), Queensland, in December, beaten from an aquatic plant.

TORTRIX (?) PYRRHOPA, n. sp.

Female, 16. Head, thorax, and abdomen fuscous; abdomen whitish beneath. Antennæ and legs ochreous fuscous. Forewings moderate, slightly dilated posteriorly, costa gently arched, apex rounded, hindmargin sinuate in middle; dull reddish fuscous, irregularly strigulated with darker fuscous and blackish; a suffused darker fuscous quadrate patch on inner-margin from base to before middle, reaching more than half across wing; extreme costal edge ochreous-white; cilia reddish-fuscous. Hindwings with hindmargin rounded, somewhat sinuate in middle;

bright orange; a very broad fuscous suffusion, occupying three-fourths of wing, suffusedly continued along hindmargin to base; cilia orange (imperfect).

One specimen from dense scrub in December, at Mackay, Queensland. This is another doubtful species. It partakes of all the characters of *Dipterina*, excepting the palpi, the terminal joint of which is exposed, which I consider sufficient to remove it from that genus. It does not agree with the genus *Tortrix*, through the stalking of veins six and seven of the hindwings. The specimen being a female, it admits of no definite decision in regard to the antennal characters. In general appearance it is not unlike *Scoliopecta comptana*, Walk.

#### ATYCHIADÆ.

##### ATYCHIA ANTHOMERA, n. sp.

Male, 12 mm. Head, palpi, thorax, and abdomen fuscous. Thorax beneath ochreous-whitish. Antennæ black at base, beneath ochreous-white. Abdomen with faint whitish segmental rings; anal tuft fuscous, mixed with yellow. Forewings moderate, short; costa almost straight; apex rounded. Hindmargin obliquely rounded, dark-fuscous; a faint somewhat hyaline yellowish spot in disc at two-thirds, hardly perceptible in some specimens; cilia yellowish with a median line of dark fuscous somewhat dotted with yellow. Hindwings yellow, with a broad blackish hindmarginal band, occupying nearly half of wing, broadest at apex; cilia as in forewings. The whole of the discal area of forewings is suffused with light-yellow on the underside.

Nearest *leucopis*, Meyr., but widely different by the yellow hindwings. Three specimens at Rockhampton, Queensland, in April.

##### ATYCHIA DESMOTOMA, n. sp.

Male, 25 mm. Head, antennæ, palpi, thorax, abdomen, and legs dark-fuscous. Palpi ochreous-white beneath. Abdomen with faintly indicated whitish segmental rings. Forewings moderate; costa nearly straight; apex rounded; hindmargin obliquely rounded; dark glossy-fuscous, with a faintly indicated yellow spot in disc at two-thirds; a hardly perceptible whitish suffusion immediately beyond, seemingly continued as a transverse fascia to inner margin; cilia dark-fuscous. Hindwings dark-fuscous; a roundish yellow spot just below costa at about middle; two more of same color somewhat suffused and confluent, running from near beyond first to middle of inner margin, the three forming a band, cut by ground-color between first and second; cilia light-yellow. The whole of the markings are more prominent on the



underside, and the hindwings have an additional yellow spot on costa near apex.

Two specimens from Melbourne and Cheltenham, Victoria, in December. It is not unlike a larger form of the previous species, but this is hardly probable, as the differences are well marked, and the balance seems in favor of giving it a distinctive name.

#### XYLORYCTIDÆ.

##### XYLORYCTA CANDESCENS, n. sp.

Female, 26 mm. Head, palpi, and thorax shining snow-white, second joint of palpi internally fuscous. Thorax with an irregular fuscous quadrate blotch in middle. Antennæ whitish. Legs whitish, anterior tibiæ and tarsi fuscous. Abdomen whitish, segmental margins ochreous. Forewings elongate, moderate, hardly dilated, costa nearly straight, apex somewhat pointed; hindmargin oblique; shining snow-white; extreme costal edge ochreous, becoming indistinct at and around apex, fuscous at base; a broad light fuscous longitudinal streak along inner margin, from near base to anal angle, and continued right through cilia, somewhat attenuated anteriorly; cilia shining snow-white, except at anal angle, which is fuscous through continuation of longitudinal streak. Hindwings pale-grey; cilia shining snow-white.

Brisbane, Queensland. One specimen in December. Remarkably distinct, the continuance of the fuscous longitudinal streak through the cilia is a curious and noticeable character.

##### TELECRATES DESMOCHRYSA, n. sp.

Male, 16 mm. Head, legs, and palpi orange-yellow; terminal joint of palpi as long as second, fuscous, second joint infuscated exteriorly. Legs banded with black. Abdomen and antennæ black; abdominal segments orange on margins, anal tuft orange. Forewings rather short, hardly dilated; costa arched at base, thence tolerably straight, apex rounded; hindmargin oblique; black, with ochreous markings; a narrow oblique fascia from costa at base to about one-eighth inner margin; an oblique fascia from beneath costa at one-fourth to below middle of disc at about one-fourth; upper portion somewhat irregular and broken; a similar fascia in middle of wing, not reaching either margin, with a semi-circular excavation on lower portion of anterior edge; an irregular spot on costa at about five-sixths; a dentate line immediately beneath this, somewhat curved, not reaching but approaching anal angle; cilia blackish, with a tooth of yellow at apex. Hindwings bronzy-fuscous; veins 6 and 7 from a point; a well marked wedge-shaped orange spot along base,

but not reaching inner margin, apex uppermost ; cilia blackish, becoming orange at apex and anal angle ; costa of both forewings and hindwings orange.

Nearest *letiorella* Walk., but widely distinct. One specimen from *Banksia* (? *serrata*) at Port Victor, South Australia, in November.

CRYPsICHARIS PUDICA, n. sp.

Male, 20 mm.; Female, 22 mm. Head, thorax, palpi, antennæ, legs and abdomen creamy-white ; second joint of palpi externally fuscous ; antennal ciliations of male 3 ; anterior and middle legs more or less infuscated. Forewings moderate ; costa gently arched, apex obtuse ; hindmargin obliquely rounded ; vein 7 to hindmargin, creamy-white, extreme costal edge fuscous towards base (faintly perceptible), a small black dot in middle of wing at one-third ; a second obliquely beyond on fold, and a third above second ; a series of fuscous dots from beneath costa at two-thirds ; curved round hindmargin to inner margin before anal angle ; cilia white. Hindwings and cilia white ; veins 6 and 7 stalked. Not unlike a faded specimen of some species of *Hoplitica* (*Cecophoridae*), especially *sobriella*, Walk.

Four specimens beaten from *Eugenia* at "Kedron Book," Brisbane, Queensland, in January. The species under notice may ultimately require a new genus to receive it, as the neuration of the hindwings is not in perfect accord with *Crypsicharis*, but as intermediate forms may be discovered in the future I consider it advisable to refrain from forming a new genus at present.

CECOPHORIDÆ.

EOCHROIS SARCOsMA, n. sp.

Female, 28 mm. Head, palpi, and thorax, fleshy white, hairs of second joint of palpi somewhat loose at apex, basal half fuscous beneath. Antennæ pale reddish, hairs of pecten reddish. Legs and abdomen pale flesh-color, anterior and middle legs infuscated. Forewings moderate, slightly dilated posteriorly ; costa almost straight, arched at base, apex rounded hindmargin obliquely rounded ; pale fleshy-pink ; extreme costal edge pale carmine ; a moderately broad longitudinal whitish streak immediately beneath costa, from base to about two-thirds, somewhat suffused and shading into ground-color on lower half ; a small blackish spot on fold beneath middle at one third ; a larger one obliquely above it, and a double one in middle at two-thirds, all more or less mixed or edged with reddish ; cilia salmon-pink, inclining to yellowish. Hindwings pale ochreous, apical half somewhat purplish-fuscous ; cilia pale salmon-pink, becoming yellowish at base and with a faint fuscous basal line.

One fine specimen taken by Mr. Horace Lower, at Cock-

burn, S. Australia, in April (at light). I have another specimen, which may be the male of this species, but it is not in a fit condition to describe, therefore the point cannot be determined with certainty. The only difference, so far as can be made out, is the smaller size and deeper color of forewings. This specimen was taken by myself at Broken Hill, N.S. Wales, in May.

*EULECHRIA TETRATHERMA*, n. sp.

Male, 25 mm. Head, antennæ, abdomen, and legs blackish-fuscous, posterior and middle tibiæ and tarsi ringed with orange. Abdomen beneath orange-yellow. Thorax yellow, anterior half blackish-fuscous; palpi orange, terminal joint and extreme apex of second blackish-fuscous. Forewings moderate, rather narrow; costa slightly arched, apex rounded, hindmargin obliquely rounded; blackish, with bright orange markings; a small basal spot; a tolerably broad fascia, from immediately beneath costa at about one fifth to above inner margin at one quarter; a second similar and nearly straight, from middle of costa to middle of inner margin; an elongate triangular spot from costa at five-sixths, reaching more than half across wing, indented below middle on posterior portion; cilia blackish-fuscous. Hindwings ovate-lanceolate; bright orange; hindmargin narrowly and apex broadly suffused with blackish; cilia as in forewings.

A beautiful and distinct species in the neighborhood of *xanthostephana*, Meyr., but immediately known from that or any other allied species by the hindwings. One specimen taken at Brighton, Victoria, in December.

*EULECHRIA DELTACOSTAMELA*, n. sp.

Male, 22 mm.; female, 24 mm. Head and palpi dull yellowish; second joint of palpi fuscous beneath, except apex. Thorax ochreous fuscous, darkest anteriorly. Abdomen ochreous. Legs and antennæ dark fuscous, antennal ciliations one and a half. Forewings moderate, costa gently arched, apex rounded, hindmargin obliquely rounded; pale ochreous, tinged with fuscous; a dark fuscous, irregularly oblique fascia, anterior edge well defined, from costa at base to inner-margin at about one-sixth, posterior edge very suffused, from about one-sixth of costa to one-third of inner-margin, with a more or less well defined projection on middle; space between anterior edge of fascia and base ochreous-white, sharply defined; a small indistinct fuscous spot above middle of disc at one-third; a sharply defined blackish elongate, hardly triangular, spot on costa at about three fifths; an indistinct spot below posterior edge of this, being an indication of a zigzag line from costa; a small fuscous mark beneath costa at five-sixths; a hindmarginal row of small fuscous dots; cilia

ochreous-grey, mixed with fuscous. Hindwings grey or fuscous-grey; cilia greyish-fuscous.

Four specimens taken at Duaringa, Queensland, in June. Not near any other species of the genus known to me, but reminds one of some species of *Phlæopola*. The whitish basal patch and its separation by the anterior line of dark-fuscous fascia is a very good distinguishing point.

EULECHRIA THERMISTIS, n. sp.

Male, 25 mm. Head, palpi, antennæ, legs, and abdomen blackish-fuscous. Legs mixed with white, hairs of posterior pair yellowish. Forewings moderate, costa gently arched, apex rounded, hindmargin obliquely rounded; dark fuscous, finely and irregularly irrorated with leaden-whitish scales, extreme costal edge slightly yellowish in middle, two thick black transverse parallel lines from one-third of costa to about one-third of inner-margin, confluent on inner-margin; a small indistinct blackish spot in disc below middle at two-thirds; a thick black transverse band from four-fifths of costa to anal angle, narrow on costa, containing a whitish dot in middle; veins between this band and hindmargin neatly outlined with black; cilia blackish. Hindwings orange; a moderately broad, blackish hindmarginal band, broadest at apex; cilia blackish.

One specimen bred from *Blue Gum* by Mr. G. Lyell, jun., of Gisborne, Victoria, in October. It is closely allied to *philotherma*, Meyr., but is immediately distinguished by the color of the head, the costal edge, and differently arranged markings of forewings.

PHILOBATA GONOSTROPHA, n. sp.

Male, 23 mm. Head, thorax, antennæ, palpi, and legs ashy grey-whitish, lower two-thirds of second joint of palpi whitish externally, posterior legs ochreous-whitish. Abdomen light fuscous, segmental margins and anal tuft grey-whitish. Forewings elongate, moderate; costa gently arched, hindmargin obliquely rounded; ashy-grey-whitish, mixed with white along inner margin towards base and above middle of disc towards hindmargin; a short black longitudinal mark on fold about middle, a shorter similar mark above this, a moderate black line starting from between the two elongate marks, continued beyond them, thence with a strong curve round to beneath costa at about three-quarters, then continued obliquely to costa before apex; a curved row of elongate black spots before hindmargin, becoming lost in ground-color towards apex; cilia ashy-grey-whitish. Hindwings dark fuscous-grey; cilia fuscous-grey, with a darker basal line.

One specimen at Broken Hill, N.S.W., in May. Not unlike some species of *Eulechria*, especially *xylopterella*, Walk.

## GLYPHIPTERYGIDÆ.

## SIMÆTHIS CHIONODESMA, n. sp.

Female, 12 mm. Head, thorax, and antennæ dark-fuscous. Antennæ annulated with whitish-ochreous. Thorax beneath ochreous. Palpi ochreous; anterior legs ochreous, banded with blackish. (Abdomen broken.) Forewings short, triangularly dilated; costa arched, more strongly towards apex; apex round-pointed; hindmargin obliquely rounded, hardly sinuate beneath apex; deep purple-fuscous; a straight, broad, whitish, transverse band, from one-third costa to one-third inner-margin, containing a yellow streak throughout, posteriorly slightly fuscous-edged; anterior edge of band straight, posterior edge somewhat denticulate, and with a sharply-marked indentation above middle; cilia fuscous, with two broad yellow teeth, one below apex, the other just below middle. Hindwings moderately broad; ochreous-fuscous; two elongate cuneiform orange marks, attenuated at base: one in middle of wing, the other very near inner margin, more or less confluent at base; two large suffused orange blotches, placed one at end of each spot, and almost touching hindmargin; cilia as in forewings.

One specimen taken in Botanic Gardens, Brisbane, Queensland, in January. The specimen before me not being in the best of condition, this description may require extension; for instance, there appears to be a short whitish mark on inner margin near, but I am inclined to think this is caused by the denudation of scales, yet it seems a natural marking; there also appears to be a blackish dot in the transverse band, but the setting-needling has pierced the mark, and obliterated all but a trace of black.

## SIMÆTHIS OPHIOSEMA, n. sp.

Female, 14 mm. Head, thorax, antennæ, and abdomen dark-fuscous. Thorax with a narrow, pale-yellow anterior band, posteriorly edged with a band of fuscous. Antennæ annulated with white. Abdomen with a median orange blotch. Legs and palpi ochreous-yellow; palpi tinged with blackish; anterior tarsi ringed with blackish. Forewings triangularly dilated; costa arched; hindmargin irregularly rounded, hardly sinuate beneath apex; dark-fuscous, with fuscous irregular markings; a dull-whitish basal patch; a similarly colored, slightly curved, transverse band, edges denticulate, separated from basal patch by a narrow, wavy, dull, orange-ochreous band, sharply edged on either side by a fine black line; another very irregular, dull-whitish band, running from before apex to anal angle, abruptly curved inwards, and containing two or three sharp teeth on lower half anteriorly; anterior to these teeth the ground color is darker, causing the markings to become more distinct on the upper half;

a fine, black-edged band of dull orange, from about two-thirds costa, and appearing to join the three teeth at extremity; a suffused, triangular patch of ground color on costa midway between bands; an irregular line of orange along hindmargin; a double black hindmarginal line, containing a streak of dull-orange throughout; cilia fuscous, with two whitish spots above and below middle. Hindwings orange; costa blackish, with a somewhat elongate cuneiform mark attenuated to base; a broad, blackish, hindmarginal band from apex to anal angle, and containing a streak of ground color, emitted from about half of band to base, and a similar one along inner margin to base; extremities confluent, and containing a streak of ground color; cilia dull ochreous-orange, dark-fuscous around anal angle; a dark-fuscous, sharply-defined basal line.

A difficult and somewhat complicated insect to clearly describe. The description of *sycompola*, Meyr., is in many respects similar to this species, but the thorax and hindwings are good distinguishing points. Two specimens taken at Rockhampton, Queensland, in February.

#### GELECHIAE.

##### GELECHIA ANTHOCHRA, n. sp.

Male, 16 mm. Head, thorax, and palpi, pale ochreous-whitish, apex of second joint and a central ring of terminal joint blackish. Legs dark fuscous, with ochreous-whitish tarsal rings; posterior legs and abdomen ochreous-white. Antennæ fuscous-whitish. Forewings moderate, costa hardly arched, apex rounded, hindmargin obliquely rounded; pale ochreous-white, with dark fuscous markings; a short oblique mark on costa near base; a spot just beneath costa at one-fourth; a second larger, obliquely beneath and before it; a third smaller, obliquely beneath and beyond the first; a fourth very small, immediately above the third; and a fifth similar to fourth, and in a line with it, beyond middle; a suffused spot on costa at three-fourths, emitting a row of very suffused spots round apex to hindmargin above anal angle; hindmarginal and apical area more or less irregularly suffused with fuscous; cilia ochreous-grey, basal half pale fuscous. Hindwings greyish-fuscous; cilia greyish-ochreous.

Three specimens from Rockhampton, Queensland, in September.

##### GELECHIA XANTHASTIS, n. sp.

Male, 10 mm. Head, thorax, and palpi bright yellow, thorax anteriorly narrowly fuscous-purple, patagiæ fuscous-purple, terminal joint of palpi fuscous. Antennæ fuscous, imperfectly annulated with yellow. Legs fuscous, anterior and middle tibiæ and tarsi with yellowish rings, posterior legs and abdomen ochreous-yellowish, somewhat infuscated. Forewings moderate, costa nearly straight, apex round pointed; hindmargin obliquely

rounded; bright yellow, with dark fuscous-purple markings; a broad straight fascia close to base, edges concave; a broader straight-edged transverse fascia from three-fourths to just before anal angle; a moderate hindmarginal band not quite reaching anal angle, but nearly touching second fascia at lower extremity; cilia fuscous-purple. Hindwings dark fuscous; cilia fuscous, with a tooth of pale yellow on costa.

Three specimens taken at electric light, at Rockhampton, Queensland, in December.

*GELECHIA DELTODES*, n. sp.

Female, 20 mm. Head, palpi, and thorax ochreous-white. Head smooth, antennæ fuscous, basal fourth ochreous; legs dark-fuscous ringed with ochreous white. Abdomen dark-fuscous, anal tuft ochreous. Forewings moderate; costa nearly straight; hindmargin oblique; dark bronzy-fuscous, with ochreous markings; a small roundish basal spot; a large irregular quadrate spot on inner margin at anal angle, becoming more yellowish posteriorly, and irregularly edged anteriorly by a blackish line, from which are emitted two obscure blackish lines on veins, going towards, but not reaching base of wing; about five small spots on costa irregularly edged with black, from posterior one proceeds a curved row of minute spots round hindmargin to anal angle; three or four small irregular spots in disc; cilia greyish-fuscous, basal half blackish. Hindwings and cilia greyish.

A distinct and easily recognised species, the quadrate patch giving it a very distinct appearance. One specimen taken at Gisborne, Victoria, in October, by Mr. G. Lyell, jun.

*GELECHIA HÆMASPILA*, *Lower*.

*GELECHIA NANA*, *Lower*.

Recent captures of the above species at Broken Hill, N.S.W., during August and September have convinced me that they are identical, the variations, however, are exceedingly great. From a series of 16 specimens no less than eight varieties were obtained, three of which at least would, in the absence of a series, lend themselves to be considered distinct species. I am satisfied, however, that they are one and the same.

*Var. A.*—All markings obsolete excepting the "irregular cordate spot" at one third, which is, however, almost black instead of being reddish.

*Var. B.*—All marking as type, but forewings with two fine sharply defined black streaks, one from base to the "irregular cordate spot," and another from upper edge of spot to middle of hindmargin with a blackish tooth in middle.

*Var. c.*—All spots on costa connected with black lines along veins, all other veins outlined with black, giving the appearance of alternate lines of ground-color and black.

One noticeable character throughout the whole of the varieties is the persistence of the fiery reddish spot on *inner margin* near base. I purpose retaining the specific name *haemaspila* for the species as being more appropriate in definition.

CROCANTHES EPITHERMA, n. sp.

Male, 10 mm.; Female, 12 mm. Head, thorax, antennæ, palpi and legs ochreous-white; antennæ slightly longer than forewing; terminal joint of palpi internally tinged with fuscous on apical half; abdomen yellow. Forewings moderate elongate; dilated posteriorly; costa gently arched; apex somewhat pointed; hindmargin oblique, slightly sinuate beneath apex; bright orange-yellow; a thick fuscous, streak along basal half of costa; a faint elongate fuscous spot on costa just beyond this, from which proceeds a faint curved line to about middle of hindmargin, but hardly reaching it; a few faint fuscous scales along inner margin towards base; a strongly marked fine black hindmarginal line, hardly reaching margins; cilia blackish-fuscous, becoming yellow round anal angle, tips darker. Hindwings with apex somewhat prominent, pale yellow; a very faintly indicated angulated line from middle of costa approaching inner margin, but not reaching it; hindmarginal line as in forewings; cilia pale yellow, becoming fuscous at apex.

Eleven specimens in dense scrub at Mackay, Queensland, in December.

CROCANTHES ACROXANTHA, n. sp.

Male and Female, 12 mm. Head, palpi, antennæ; legs and thorax ochreous-white. Antennæ longer than forewings; posterior tibiæ and tarsi ringed with blackish. Abdomen yellow. Forewings moderate elongate, rather narrow; costa gently arched, more strongly towards apex; apex somewhat pointed; hindmargin obliquely rounded, sinuate somewhat beneath apex; yellow, finely irrorated throughout with fuscous; a narrow fuscous streak along costa from base to middle; a narrow fuscous elongate mark on costa at three-fourths, from anterior extremity of which proceeds a fuscous streak to two-thirds of inner margin with a slight curve at extremity; an irregular fuscous hindmarginal line, not reaching extremities; cilia fuscous with a sharply defined yellow basal line. Hindwings with apex somewhat prominent, fuscous; cilia as in forewings, but lighter throughout.

Allied to the preceding species, but apart from the narrower forewings it is immediately separated by the fuscous hindwings. Both this and the preceding species are allied to *prasinopsis*, Meyr., Mackay and Rockhampton, Queensland. Seven specimens in November amongst dense scrub.



PRELIMINARY NOTES ON GENYORNIS NEWTONI;  
A NEW GENUS AND SPECIES OF FOSSIL  
STRUTHIOUS BIRD FOUND AT LAKE CALLA-  
BONNA, SOUTH AUSTRALIA.

By E. C. STIRLING, M.D., F.R.S., C.M.Z.S., Director, \*

AND

A. H. C. ZIETZ, F.L.S., Assistant Director, South Australian  
Museum.

[Read August 4, 1896.]

Some account of the discovery of fossil remains at Lake Callabonna, by one of us, appeared in "Nature," 1894, Vol. L., pp. 184 and 206. Since then various circumstances which were alluded to at the time, besides considerable difficulties in connection with the restoration and treatment of the bones have retarded the development of the discovery and the publication of the results; nevertheless, though the work of dealing with a large mass of material is still far from complete, we find ourselves, at last, in a position to offer to this Society some preliminary notes upon the subject in respect of the remains of the large struthious bird which were found in association with bones of *Diprotodon* and other extinct marsupials.

As, in the course of this paper, reference will have frequently to be made to previous discoveries, in Australia, of bones of the same group of birds it will be convenient to commence our observations by a brief epitome of these.

That work has been materially facilitated by a paper by Mr. Robt. Etheridge, junr., who, in a paper in the "Records of the Geological Society of New South Wales," † succinctly reviews the history of the various discoveries of struthious birds in Australia. From this paper we have freely borrowed, and we accordingly express our thanks and acknowledgment.

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\* Justice requires an acknowledgment on my part that to Mr. Zietz belongs the credit not only of having conducted the exhumations at Lake Callabonna, under arduous circumstances, but also of having most successfully carried out the tedious work of the restoration of bones which presented peculiar difficulties in treatment. I must be the first to admit that collaboration on my part has only been made possible by the patient and laborious exercise of Mr. Zietz's skill in this direction.—[E. C. S.]

† On Further Evidence of a Large Extinct Struthious Bird (*Dromornis*, Owen) from the Post-Tertiary Deposits of Queensland. R. Etheridge, junr., Vol. I., p. 126.

The first evidence of the former existence of these birds in Australia appears to have been in 1836, when "Sir Thomas Mitchell, F.G.S., Surveyor-General of Australia, discovered in the breccia-cave of Wellington Valley a femur," (13 inches in length), "wanting the lower end, having the lower ends mutilated, and encrusted with the red stalagmite of the cave, which I determined to belong to a large bird, probably, from its size, struthious or brevipennate, but not presenting characters which, at that time, justified me in suggesting closer affinities."\* This femur is figured in Mitchell's work.†

In 1865 or 1866 (the alternative dates are given because both appear in two different notices by the author), at Penola, South Australia, the Rev. J. E. Tenison Woods came into possession of "two tibias and two tarso-metatarsal bones of some extinct and very large bird."‡

There is a further discrepancy in Mr. Woods' notices of the discovery in respect of the position in which the bones were found, for, in one place, he states that they were found "in sinking a well,"|| and, in another, that they were found "near a native well."§

In a subsequent reference ¶ Mr. Woods provisionally proposed the name of *Dromaius australis* for this bird.

An important part of Mr. Woods's statements concerning it is the expression of his belief in its contemporaneity with man. He says in the first-mentioned notice that "It is certainly quite extinct, but appears to have been contemporaneous with the natives, for these bones are marked with old scars, one of which must certainly have been inflicted by a sharper instrument than any in the possession of the natives at present; there were, however, fragments of flint buried with the bones, and a native well about 50 yards away."

We have not been able to examine these bones, nor even do we know what has become of them. Perhaps they are among those fossils which, we understand, lie hidden in obscurity in the Penola Institute, and we propose to investigate the question. If, however, the statement of Mr. Woods concerning the contemporaneity of the bones with man can be substantiated it is one of

\* On *Dinornis*, Trans. Zool. Soc., Owen vol. VIII., p. 381; also Extinct wingless birds of New Zealand (*Dromornis australis*). Appendix, p. 1.

† Three Expeditions into the Interior of Eastern Australia, 1838, vol. II., pl. 32, figs. 12 and 13; 1839 ed. pl. 51.

‡ Report on the Geology and Mineralogy of the South-Eastern District of South Australia by the Rev. J. E. Tenison Woods, p. 7.

|| *Ibid.*

§ Nat. History of New South Wales—An Essay, p. 27 (quoted from Etheridge, *op. cit.*).

¶ Proc. Linn. Soc., N.S.W., 1883, VII., p. 387.

the greatest importance as affording, so far as we know, the only direct evidence of the coexistence of man in Australia with the extinct fauna.

Mr. Woods' description of the bones is not very clear, but a certain interpretation of it lends support to the view that the bones in question were those of the bird for which we shall propose the generic name *Genyornis*.

In 1869, the late Rev. W. B. Clarke, Government Geologist of New South Wales, announced, both to the *Sydney Morning Herald* (May 19) and to the *Geological Magazine* (Vol. VI., p. 383), the discovery of a femur (nearly twelve inches in length) during the digging of a well at Peak Downs in Queensland. As Mr. Etheridge points out there is, in this case also, some discrepancy in the statements as to the exact position in which the bone was found. This femur was determined by Mr. Krefft, then Curator of the Australian Museum, to be that of a *Dinornis*.

A cast of it, with photographs, was transmitted to Professor Owen who described it in detail and founded on it the genus *Dromornis*; summarized his conclusions as follows:—"I infer that in its essential characters this femur resembles more that bone in the emu than in the moa, and that the characters in which it more resembles *Dinornis* are concomitant with, and related to, the more general strength and robustness of the bone—from which we may infer that the species manifested dinornithic strength and proportions of the hind limbs, combined with characters of closer affinity to the existing smaller, more slender-limbed, and swifter wingless bird peculiar to the Australian continent."\*

In 1876, again through the instrumentality of the Rev. W. B. Clarke, a fragment of a pelvis of a large bird, including the left acetabulum, found at a depth of 200 feet, at the Canadian Gold Lead, near Mudgee, N.S.W., was transmitted to Professor Owen, who assigned it to *Dromornis*.† In the same paper he describes a portion of a tibia, supposed to have come from a cave at Mt. Gambier, South Australia.‡ This also Professor Owen allocated to *Dromornis*, but remarks "one cannot of course state confidently that it is a bone of the same species as the mutilated femur from the cave of Wellington Valley, or of that of the drift at Peak Downs, in Queensland." We believe that this fragment may be assigned to *Genyornis*.

\* Trans. Zool. Soc. Vol. VIII., p. 383. Extinct wingless birds of New Zealand. Appendix, p. 13.

† Trans. Zool. Soc., 1877, Vol. X., p. 186. Extinct wingless birds of New Zealand. Appendix, p. 6.

‡ This was presented to the British Museum by the Trustees of the Adelaide Museum, 1872.—Brit. Mus. Cat. Fossil Birds, p. 356.

In the proceedings of the Royal Society of Queensland, for 1884 (Vol. I., p. 23), Mr. De Vis describes a fragment of the proximal end of a femur of a struthious bird that was discovered, with other bones, at King's Creek, in the Darling Downs district. In the author's opinion the characters of this fragment justify its reference to the genus *Dinornis*, and he accordingly assigned to its possessor the name *Dinornis queenslandiæ*. This conclusion has, however, been contested by so competent an authority as Professor Hutton, and no doubt requires the confirmatory evidence of more complete material.

In 1889 remains of a large struthious bird were found at an old spring, in sinking a well, at a depth of 20 feet from the surface at Thorbindah, near Cainwarra Station, on the Paroo River, Queensland, in association with fragments of bones of kangaroos, *Diprotodon*, and *Dromæus*, and forwarded to the Government Geologist by Mr. A. S. Cotter. These were described by Mr. Etheridge in the paper to which we have expressed our indebtedness as portions of "the right tibia and left fibula of a large struthious bird, and the right tibia of an emu;" both of the portions of the larger bones were assigned by the author to *Dromornis*.

As to the fragment of tibia, we can have no doubt that it belongs to the same bird as the Mount Gambier and Callabonna fossils; but to this matter we must recur. The fragment, however, believed by Mr. Etheridge to be a part of the fibula, is certainly not any part of that bone in the Callabonna bird, and, indeed, we cannot make it correspond to any part of *Genyornis* which we possess, nor, moreover, does it correspond to any part of any fossil bone with which we are able to compare it, whether of bird or mammal.

As we are dealing particularly with the larger forms of struthious birds, we do no more than mention, in this place, that fossil fragments of bones, which have been referred to the existing genus *Dromæus*, have been recorded from the Post-Tertiary deposits of the Wellington Caves and other localities. One such fragment, from the Darling Downs, of slightly larger dimensions than the living species *Dromæus norce-hollandiæ*, constitutes the type of *Dromæus patricius*,\* which name was accepted by Mr. Etheridge for the fragment found at the Paroo River with the larger bones.† So also a fossil representative of *Casuaris* (stated to be allied to *C. picticollis*, Lydekker, Brit. Mus. Cat. Fossil Birds), in the form of a distal portion of the tibio-tarsus, was also obtained in the cave deposits of Wellington Valley.

\* "A Glimpse of the Post-Tertiary Avi-fauna of Queensland," Proc. Linn. Soc. N.S.W., 1888, Vol. III., 2nd ser., p. 1277.

† Records Geol. Surv. of N.S.W., *loc cit.*, p. 133.

Up to this point these references are based upon published statements, which have been so conveniently summarised by Mr. Etheridge. We may now add to the list by a notice of some other discoveries in South Australia, which have either not yet been made public or which have only received a passing notice in the current press.

In 1879 the South Australian Museum received, from Mr. R. M. Robertson various collections of fossil bones found near Normanville, South Australia. Amongst these, which included remains of *Diprotodon*, *Macropus*, *Phascalomys*, *Bettongia* and *Thylacoleo*, were a portion of a femur and of two or three tibiae. We are now able to refer all the latter to the Callabonna bird.

In 1889 one of us (A.Z.), in the course of the exhumation of *Diprotodon* bones at Baldina Creek, on the edge of the Eastern Plains, near Burra, South Australia, obtained a considerable portion of a femur, which can also be referred to the same species.

Lastly, in 1893, came the discovery, already noticed in "Nature,"\* of a large number of bird-bones at Lake Callabonna found in association with those of *Diprotodon* and of other extinct marsupials. To the circumstances of this discovery, so far as it relates to the birds, a few further details will be given directly.

For convenience of reference we may now epitomise, in their proper order, the various discoveries of large bird bones which have been mentioned above.

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\* *Loc. cit.*

Date.	Locality.	Colony.	Discoverer, or Author (in brackets).	Nature of Remains.
1836	Wellington Caves ...	N.S.W.	Sir T. Mitchell ...	Femur, mutilated
1865 or 6	Penola ...	S.A.	Rev. J. E. Tenison Woods ...	Two tibiae and two metatarsi
1869	Peak Downs (Dromornis)	Q.	Rev. W. B. Clarke ...	Femur
1876	Canadian Lead	N.S.W.	Mr. Dietz ...	Portion of pelvis
1876 or 7	Mount Gambier	S.A.	(Prof. Owen) ...	Fragment of tibia
1879	Normanville ...	S.A.	Mr. R. M. Robertson ...	Portions of femur and of three tibiae
1884	King's Creek ...	Q.	(Mr. C. W. De Vis) ...	Portion of femur
1889	Paroo River ...	Q.	Mr. A. S. Cotter ...	Portion of tibia : of fibula ?
1889	Baldina Creek ...	S.A.	Mr. A. Zietz ...	Portion of femur
1893	Lake Callabonna ...	S.A.	Mr. A. Zietz ...	Many bones, <i>vide infra</i>
			Mr. H. Hurst ...	

## GEOLOGICAL AGE OF THE VARIOUS BIRD REMAINS.

As to the geological age of the various bones Mr. Etheridge remarks:—"The femora" (Wellington Caves, Peak Downs and King's Creek) "and the tibia" (Mount Gambier) "coming from what may be generally termed Quaternary deposits may, for argument's sake, be considered of the same geological age. But it is questionable if the pelvis from the Canadian Lead can be so regarded. As previously stated it was found at a depth of 200 ft. in an auriferous lead of supposed Pliocene age, and it is therefore somewhat premature to class these remains as all of one period. Rather, would it not be better to consider the pelvis from the Canadian Lead as one of the earliest bird remains yet extant on this continent, and of Pliocene age; and those from the other localities as representing a Post-Pliocene period."\*

As to the Penola remains the discrepancies in Mr. Woods' statements as to their position have already been alluded to, but the expression of belief from a geologist in the contemporaneity of the bird with the natives and the distinct assertion, in one of his notices of the remains, that they were found "in one of the kitchen middens of the natives of South Australia. The bones were marked by the scrapings and cuttings of the flint knives of the blacks," at least implies a recent period. †

With regard to the Normanville and Baldina Creek fossils we are informed by Mr. Howchin that some uncertainty exists as to whether the deposits in which they were found should be regarded as Pliocene or Pleistocene.

At Callabonna the fossiliferous formation was determined by Professor Tate ‡ to be Pliocene.

## THE DISCOVERY OF BIRD-BONES AT LAKE CALLABONNA.

Some reference was made to the discovery of bird-bones in the papers in "Nature" already referred to, but it may not be without interest to add, in this place, a few further details. These we quote in the first person singular as proceeding from the one of us (A.Z.) who personally conducted the operations at Lake Callabonna.

"The level bottom of Callabonna Lake, the characters of which have been described,|| shows, in some places, small elevations of about two square feet in size,§ formed of concretionary lime-

\* Op. cit., p. 129.

† Proc. Lin. Soc., N.S.W., 1882, Vol. VII., p. 387.

‡ "Nature," 1894, Vol. L., p. 207.

"Nature," Vol. L., p. 187.

§ These elevations are distinguished from those covering the skeletons of Kangaroos and Diprotodons by their smaller size and by the presence of pebbles.

stone. These, when closely examined, were found to form incrustations for the more solid bird bones. Around, and above, these elevations were scattered numerous small smooth pebbles,\* which were partly buried in drift sand. The elevations could still be recognised during the dry season, when the whole bed of the lake was covered with a white saline incrustation.

“The remains of the first two birds found were imperfect skeletons of which only the leg and toe bones (which were underground) could be removed, all the other bones being irretrievably damaged. Subsequently, when the clay bottom of the lake became sufficiently dry and hard for camel riding, I made a flying trip of two days duration to the north-western shore of the lake, about eight miles distant from our camp, where, I was told, bird bones had been noticed in greater number. The result of this trip, however, proved to be unsatisfactory, only a few bones being obtained and these in a very defective state.

“In the course of time, while proceeding with the exhumation of *Diprotodon* fossils near our permanent camp, single bird bones were frequently found mixed with those of the former animal; but in many cases they were destroyed before they were noticed. This was unavoidable, because, in order to gain access to the large *Diprotodon* bones which were to be removed, great masses of clay had to be shifted, and it was in the course of this removal that the accidental damage took place to the smaller and unnoticed bird bones which were disseminated in the clay. Judging from the frequency with which its remains were found, this bird must have been numerous at the time of its existence. During the second month's operations we discovered a nearly perfect sternum—the only good specimen obtained—and near to it other parts of a skeleton scattered throughout the clay. All, however, except the sternum were in a very bad condition. In the course of the third month a part of the lake, near our camp, which was, at the time of our arrival, partly under water and too boggy for work, became partly dry, owing to the continuance of dry northerly winds.

“To this place I decided to give a trial with the result that three bird skeletons, besides other fossils, were found lying close together and only about a foot below the surface. The first bone uncovered was a pelvis, and on following this up we came upon the vertebral column which was, however, in a hopeless state of decay; near the end of this was the lower jaw. Perceiving also, with great delight, parts of the skull, I decided to extract the whole mass of surrounding clay in which it was embedded. The second skeleton was in a similiar condition:—head only partly recognisable; pelvis good; sternum, both in this and the previous

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\* “Nature,” Vol. L., p. 208.



specimen, broken up into fragments ; vertebræ little interrupted as a series, but each individual segment broken into minute fragments which made it impossible to remove them whole. One wing was nearly complete, but the bones of the other were only in fragments ; caudal vertebræ in fair condition. The legs of all the birds found were directed downward, and were in a flexed position. The lower end of the tibio-tarsus, the tarso-metatarsal and toe bones were invariably incrustated with hard limestone to the thickness of half an inch, which had to be chipped off, and in the course of removal of this crust some bones were injured. The lower ends of the legs extended to a depth of several feet under ground where water was always present. The third bird skeleton was rather incomplete :—head in fragments ; pelvis imperfect ; no sternum ; the legs only were in good condition. The remains of these three birds were found within a space of about six square yards and, as they lay on one side, their heads and necks were directed towards the south-west—the deepest part of the lake bed. It may be mentioned that all the bones situated near the surface were always found broken up into innumerable fragments, which was due to the growth of tufts of fibrous crystals.

[We are indebted to Mr. E. F. Turner, Demonstrator of Chemistry at the University, for the following note on the constitution and formation of these crystals :—The material submitted consists of clay impregnated, and covered, with filiform crystals, which are composed of halite, together with smaller quantities of gypsum, glauberite and alunite. On saturating the mass of clay with water, and then allowing it to dry, the crystals again appeared on the surface—capillary attraction leading the saturated solution of the above salts to deposit, in the first place, the cubical crystals of common salt and the octahedral crystals of alunite ; these then become bound together by the prismatic crystals of glauberite and gypsum, the result being that a protruding mass of filiform crystals is formed.]

“Under atmospheric influences, in which dry conditions of the clay are succeeded by moist, these crystals are alternately formed, in and around the bones, and redissolved ; with the result that constant scaling takes place from their surfaces until at last the whole bone crumbles into fine powder. Or, short of this, the infiltration of the bones with so much salt confers on them such hygrometric properties that, even in an ordinary damp atmosphere, they become moist, and can only be dried with great difficulty ; while, on the other hand, in the very dry weather of the Australian summer they become brittle to an extreme degree. The shrinkage, on drying, and consequent cracking of the masses of clay, enveloping the bones, also constituted a cause of damage. To give some idea of the extent to which this took place it may

be mentioned that a block of clay, containing bones which filled a box about 15 inches square, developed cracks in two places each over an inch in width. Such facts will in some measure explain the difficulties and delays that have been experienced in connection with the restoration of these bones.

"It may perhaps be mentioned in this place that, on one occasion, the white incrustation of saline crystals which then covered the surface of the lake was completely blown off by the force of the wind, leaving bare the natural clay of its bed.

"The appearance on the surface of skeletons, particularly of *Diprotodon*, is, no doubt, to be explained by a similar and recurring action of the wind, which, at certain seasons, blows with great force and frequency on the desiccated surface of the clay itself. *Vide* 'Nature,' vol. L., p. 210.

"The position of the sternum was always indicated by the presence of the gravel masses, previously mentioned, which rested upon its concave (upper) surface, whether on, or below, the ground. Though a few fragments of birds' bones were obtained before my arrival on the field, nearly all of them were obtained towards the latter part of my stay. Short of an exact enumeration it may be stated that the material obtained comprises about six femora, three only being in really good condition, the others unfortunately much distorted, by pressure, or otherwise injured; the tibio-tarsi, tarso-metatarsi, and toe bones of about a dozen birds, the majority of these being now in an excellent state of completeness and preservation; one almost perfect sternum; one skull a good deal damaged with its hyoid bone, and parts of a second head with the greater portion of its lower jaw; one nearly complete wing, with portions of others; two ribs; one set of caudal vertebræ and three pelves—the latter being much broken, partly by rabbits in camp (*Vide* 'Nature,' vol. L., p. 210), partly in transit, and partly on account of the conditions just described."

#### EXISTING NOMENCLATURE OF THE LARGE AUSTRALIAN FOSSIL STRUTHIOUS BIRDS.

So far as this is concerned the position is as follows:—

The genus *Dromornis* was founded by Professor Owen, on the Peak Downs femur, and the author has, at least provisionally, referred to the same genus the first found femur of the Wellington Caves, the fragment of the pelvis of the Canadian Lead and the portion of the Mount Gambier tibio-tarsus. "The probabilities are" says Professor Owen, in a letter to Mr. Clarke,\* "that the femur from the breccia cave of Wellington Valley, that described (from Peak Downs), your portion of a pelvis, and the South Australian tibia are parts of the same genus if not species. It is

\* Journal and Proc. R. Soc. N.S.W., 1877, Vol. XL., p. 43.

more convenient and conducive to progress to regard them, until proof of the contrary be had, as parts of *Dromornis australis*." This was somewhat qualified by a later statement already quoted, which very reasonably implied that it must still be an open question as to the specific identity of the Mt. Gambier tibia with the femora of the Wellington Valley and Peak Downs.\*

The Kings Creek fragment of femur has been assigned by Mr. DeVis to the genus *Dinornis* as *D. queenslandiæ*.

For the Penola bones the Rev. J. E. Tenison Woods provisionally proposed the name *Dromaius australis* until more bones should be found, but "since then its remains have been found in other places, and Professor Owen has named it *Dromornis australis*."†

Putting aside, as not immediately concerning us, the fossil forms of emeu, *Dromornis australis* and *Dinornis queenslandiæ* are thus the only two definitely named species of large extinct Australian struthious birds.

From an examination of the bones of the Callabonna bird, so far as this has proceeded, and, in the first place, from a comparison of its femur with these two named Australian species,‡ we believe we may assert that—

1. The femur of the Callabonna bird differs so considerably from that of *Dromornis* and *Dinornis queenslandiæ* that it must be regarded as that of a different bird, and, further, that the differences are sufficiently great to justify the establishment of a separate genus.

2. The Mount Gambier and the Paroo River tibiæ, assigned to *Dromornis* by Professor Owen and Mr. Etheridge respectively, are identical with that bone in the Callabonna bird. As to the supposed fragment of fibula from the latter locality, we have already expressed our doubts.

3. Of the portion of the Canadian Lead pelvis, we cannot yet express an opinion, as no comparison has yet been made with that of the Callabonna bird, which is, moreover, much damaged, and still in process of restoration.

4. The other South Australian specimens from Normanville and Baldina Creek are identical with corresponding parts of the Callabonna bird.

\* Extinct wingless birds of New Zealand. Appendix, p. 6.

† Nat. Hist. N.S.W., 1882, p. 27; (quoted from Etheridge) p. 135.

‡ We have to express our acknowledgement to Mr. Etheridge and Mr. DeVis, Curators, respectively, of the Australian and Queensland Museums for forwarding to the South Australian Museum casts of these two type specimens, and to Mr. Pittman, Director of the Geological Survey of New South Wales, for his courtesy in permitting us to examine the actual specimens from the Paroo River, described by Mr. Etheridge.

Now, as the name *Dromornis* rightly belongs to the Peak Downs femur on which the genus was founded, it becomes necessary to find a name for the Callabonna fossil, whose femur is different, and we propose the name *Genyornis\* newtoni*. The generic name arises from the conspicuous feature afforded by the relatively large size of the lower mandible, which fact, at least, emerges from the, as yet, hardly commenced examination of the skull.

Under this name, therefore, we propose to include the various portions of tibiæ that have been hitherto assigned to *Dromornis*, leaving the identity of the Canadian Lead pelvis as yet undetermined.

#### GENYORNIS NEWTONI.

A detailed description of the bones of this bird, together with a comparative reference to the other forms with which it may be compared, and the necessary illustrations, are in course of preparation. In the meantime we submit the actual specimens to the Society, and beg to call attention to a few salient features that may give some indications of its characters and of its affinities, particularly with those Australian and New Zealand ratitite birds which are the first to invite comparison.

*Femur*.—This bone of *Genyornis*, in its bulk and massive proportions, claims comparison with that of the most ponderous of the moas. Though, as will be seen by reference to table I. the largest examples are nearly five inches shorter, yet, their latitudinal dimensions very nearly equal those of *Dinornis maximus*, while they considerably surpass those of *Pachyornis elephantopus*. From the the femora of Dinornithidæ that of *Genyornis* is, however, distinguished by the marked absence of prominent ridges and surfaces for muscular attachment that are often conspicuous features in the former family; by the flatness of the surfaces of the shaft; by the pyriform oval, or almost trilateral, shape of the section, and by the more considerable curvature of its internal border. It differs also in the more gradual and evenly curved ascent of its superior articular surface, as it recedes from the head to cover the trochanter. Yet notwithstanding, from the great lateral width of this surface, the trochanter rises to as great or to a greater elevation, relatively to the head, than obtains in the moas, where the ascent of the epitrochanteric surface is abrupt and steep. The femur of

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\*Γένυς, the under jaw. In the specific name we have much pleasure in dedicating this ancient bird to Professor Alfred Newton, F.R.S., Professor of Zoology in the University of Cambridge, whose name has been long intimately and honourably associated with the progress of ornithology and, from whom, both as teacher and friend, one of us has received much personal kindness and encouragement.

*Genyornis* differs also from that of these birds in the presence of a large pneumatic foramen at the topmost part of the posterior surface of the upper expansion of the shaft. In this respect it resembles the femur of the emeu and ostrich, while it differs from that of the cassowary. Great differences are also observed in the shape and proportions of the great trochanter.

The inferior extremity is also characterised by its great breadth and, in conformity thereto, the width of the intercondylar groove in the largest examples exceeds by an inch that of the femur of *D. giganteus*, Owen."\*

From the femur of *Dromornis* that of *Genyornis* is distinguished by its more massive proportions as shown in table I., and by some of the above mentioned characters, such as the shape of the section of the shaft (which in *Dromornis* is a flattened and regular oval); the marked curvature of the internal border; the presence of the pneumatic foramen and the shape and projections of the trochanter with its accessory processes. In one respect there is a resemblance to *Dromornis*, viz., in the gradual and even slope upwards of the superior articular surface towards the trochanter. So far as the mutilated condition of the *Dromornis* femur permits a comparison to be made there are also considerable differences in the details of the inferior extremity—particularly in respect of the contrast between the oblique, deep and narrow popliteal depression in this bone and the wider, shallower, and much less well defined cavity as it exists in *Genyornis*.

Whether further remains of the bird to which the fragment of femur, named *Dinornis queenslandicæ* by Mr. DeVis, belongs shall prove it undoubtedly to be an undoubted *Dinornis* or not, the sudden ascent of the trochanteric part of the articular surface of this bone in the Moas is in marked contrast to the feature that has been described for *Genyornis*. A further distinction in *D. queenslandicæ* is the considerable fore and aft projection of the trochanter which, in a smaller bone, gives a greater width of the postero-external trochanteric surface than in the larger femur of *Genyornis*.

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\*The South Australian Museum does not possess a femur of *D. maximus*.

TABLE I.

Table showing comparative measurements of the femora of *Genyornis newtoni*, *Dinornis maximus*, *Dinornis (Pachyornis) elephantopus*, and *Dromornis australis*.

	<i>Genyornis newtoni</i> , No. 1.		<i>Genyornis newtoni</i> , No. 2.		<i>Genyornis newtoni</i> , No. 3.		<i>Dinornis maximus</i> , Owen.		<i>Dinornis elephantopus</i> , Owen. <i>Pachyornis elephantopus</i> , Lydekker.		<i>Dromornis australis</i> , Owen.	
	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.
Length ... ..	13 <sup>5</sup> / <sub>16</sub> *	339	13 <sup>5</sup> / <sub>16</sub> *	345	13*	322	18 <sup>1</sup> / <sub>2</sub>	462	13	329	11 <sup>1</sup> / <sub>2</sub> *	291
Breadth of proximal end	6 <sup>11</sup> / <sub>16</sub> *	161	7 <sup>1</sup> / <sub>2</sub>	180	6 <sup>11</sup> / <sub>16</sub>	161	6 <sup>1</sup> / <sub>2</sub>	164	5 <sup>1</sup> / <sub>2</sub>	147	5 <sup>1</sup> / <sub>2</sub> *	133
Breadth of distal end ...	7	177	6 <sup>3</sup> / <sub>4</sub>	171	6 <sup>11</sup> / <sub>16</sub>	161	7 <sup>1</sup> / <sub>2</sub>	190	5 <sup>1</sup> / <sub>2</sub>	149	5*	126
Circumference at middle	9 <sup>1</sup> / <sub>2</sub>	234	9 <sup>1</sup> / <sub>2</sub>	234	8 <sup>5</sup> / <sub>16</sub>	218	9 <sup>1</sup> / <sub>2</sub>	240	7 <sup>3</sup> / <sub>4</sub>	196	6 <sup>3</sup> / <sub>4</sub>	171

For convenience of reference the measurements are given both in inches and millimetres.

The asterisk indicates that the measurements so marked are slightly curtailed by reason of abrasion of the bones.

Nos. 1 and 2 of *Genyornis* represent a pair of bones.

The measurements of *D. maximus*, *D. elephantopus*, and *Dromornis* are from Professor Owen's Table of Measurements, Trans. Zool. Soc., vol. VIII., p. 371.

The *Tibio-tarsus*, which in point of size may be compared with that of *Pachyornis elephantopus* (*vide* Table II.), is brought into line with the *Dinornithidæ* by the presence of a supra-condyloid extensor bridge, but this is in *Genyornis*, nearly median in position, instead of being near the inner border as in the former family.

The statement previously made, which assigned the Mount Gambier and Paroo River tibias to *Genyornis* now requires some further explanation. For, in Professor Owen's description of the former fossil,\* he states that of the "bridge there is no trace . . . and there is no evidence of fracture of the piers of such a

\* Trans. Zool. Soc., vol. VIII., p. 381., also Extinct wingless birds of N.Z., appendix, p. 5.

bridge. The margins of the groove whence the bridge springs in *Dinornis* are in *Dromornis* broadly convex and entire." And again, in Mr. Etheridge's paper so frequently referred to,\* it is stated, in speaking of the Paroo River fossil, that "the rounded edge of the precondylar groove at that point in the present bone, whence in *Dinornis* the piers of the bony bridge, or oblique bar would spring, are much worn away, and would at first convey the impression that a similiar structure had here existed. By following the general contour of the groove, however, and comparing with this the mechanism in a *Dinornis* tibia it is quite apparent that such a structure could not have existed in the present instance, and we are therefore dealing with a true *Dromornis* bone." Now the preciseness of these statements and the sources from which they emanate are of such a character that it requires some assurance to suggest that they have been made in error. Further, we should have ourselves to admit that, had our own notice been based upon some of the Callabonna bones, we should have been compelled to make a similiar assertion as to the absence of a bony bar. We have specimens in which the margins of the groove at the site of the bridge are so worn as to leave no trace of the previous existence of such a structure. Fortunately, however, in one specimen the bridge is *in situ* and perfect in its form and attachments; in two others the osseous attachment to one pier is intact though, on the opposite side of the groove, a narrow gap, extending though the whole width of the bar, separates the end from its corresponding pier; in others, though the bridge itself is absent, the condition of the margins clearly indicates its former existence. Mr. Pittman, Director of the Geological Survey of New South Wales, has very courteously forwarded the Paroo River fragment for our examination, and we find that the appearances presented by the piers in this bone are exactly paralleled by those of some of the Callabonna tibiae. We have, therefore, no hesitation in asserting that the bar was once present in this bone also.

As to the Mt. Gambier specimen described by Professor Owen, we are only able to refer to his plate. The margins of the groove where the bridge ought to be are there certainly shown as in a very worn condition, but not more so than in some of our own specimens, while there is so close a correspondence in other details of the bone that we have no doubt of its identity with the tibia of *Genyornis*.

In the tibio-tarsus of *Genyornis* there is a much more abrupt inward deflection of the tendinal groove, which takes place just at the place where it is spanned by the bridge, than we find in

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\* *Op cit.*

any of the Dinornithidæ. The Callabonna tibia is, moreover, characterised by a very marked inflection of the lower end of the shaft, and particularly by the incurvature of its inner border—these features being markedly in excess of those which obtain in Pachyornis. A very conspicuous feature of the *Genyornis* tibia is the massive proportions of the cnemial process, the elevation above the articular surface to which it reaches and the marked recurvature of the ecto-cnemial ridge to the extent of forming what might be described as a hamular process. In this combination of characters there is a much greater resemblance to the emeu than to the Dinornithidæ.

TABLE II.

Table showing comparative measurements of the Tibio-tarsi *Genyornis newtoni* and *Dinornis (Pachyornis) elephantopus*.

	<i>Genyornis newtoni</i> .		<i>Dinornis elephantopus</i> Owen. <i>Pachyornis elephantopus</i> , Lydekker.	
	Inches.	Mm.	Inches.	Mm.
Length ... ..	23 $\frac{3}{4}$	602	24	608
Breadth of proximal end ...	7 $\frac{5}{8}$	193	7 $\frac{5}{12}$	187
“ “ distal end ...	4	101	4 $\frac{1}{6}$	105
Circumference at middle ...	6 $\frac{3}{4}$	164	6 $\frac{5}{12}$	162

The *Genyornis* tibia belongs to one of the large pair of femora of the preceding table, and the measurements of that of *D. elephantopus* are from Owen's table.

The *tarso-metarsus* equals in length that of *Dinornis ingens*, Owen, but its latitudinal measurements are superior to the latter, in all respects except in that of the width of the distal end. Beyond this relative narrowness of the combined trochleæ these elements are, in *Genyornis*, distinguished by their inequality of size—the inner being only half the width of the outer and very slightly shorter and the outer only two-thirds of that of the mid-trochlea. The surfaces that bound the trochlear interspaces are markedly concave, and there are two perforations through the bone just above the outer trochlear interspace. In these features there is a closer resemblance to the emeu than to the cassowary,\* in which latter there is nearly equality of size between the inner and outer trochleæ and no perforation in the interspace, while in the former there is a single perforation. In general proportions, however, there is a nearer approach to the latter bird than to the

\* *Casuarinus australis*.



more slender-legged emeu. The marked trilateral character of the transverse section of the upper-half or two-thirds of the bone, and the deep longitudinal grooving of the corresponding anterior surface, constitute conspicuous features and, to some extent, further points of resemblance to both emeu and cassowary. The hypotarsus is thick, prominent and undivided.

No sign of the attachment of a hallux appears.

TABLE III.

Table showing comparative measurements of the tarso-metatarsi of *Genyornis newtoni*, *Dinornis nova-hollandiæ* (*ingens*), Owen, and *D. gracilis*, Owen.

—	<i>Genyornis newtoni</i> .		<i>Dinornis nova-hollandiæ</i> , Owen. <i>D. ingens</i> , Owen.		<i>Dinornis gracilis</i> Owen.	
	Inches.	Mm.	Inches.	Mm.	Inches.	Mm.
Length ... ..	$13\frac{3}{4}$	348	$13\frac{3}{4}$	348	13	329
Circumference at middle ...	$5\frac{3}{8}$	135	$4\frac{1}{2}$	114	$4\frac{1}{4}$	107
Breadth (transverse) of distal end* ... ..	$3\frac{1}{8}$	88	$4\frac{1}{2}$	114	$4\frac{1}{4}$	107
Transverse breadth at middle	$1\frac{7}{8}$	47	$1\frac{7}{8}$	40	$1\frac{7}{8}$	40
Antero-posterior breadth at middle ... ..	$1\frac{1}{2}$	38	$1\frac{1}{4}$	32	$1\frac{1}{8}$	30
Breadth of proximal end ...	$3\frac{3}{4}$	95	$3\frac{1}{2}$	88	$3\frac{1}{3}$	84

The *Genyornis* tarso-metatarsus does not belong to the same bird as the femur and tibio-tarsus. The measurements of the other bones are from Owen's table.

*Toes*.—The toes of the tridactyle foot are remarkably short in comparison to those of the Dinornithidæ, the middle one being only just as long, and the inner and outer hardly more than an inch longer than the respective digits of the emeu. In relative size they conform to the proportions of the corresponding trochleæ, and in the great slenderness of the inner toe we have another point of resemblance to *Dromæus*. This digit is further characterised by the lateral compression and great relative length of its proximal phalanx; the lengths of the three proximal phalanges of an average specimen being as follows:—Inner, 80 mm.; middle, 73 mm.; outer, 65 mm. The phalanges of the middle and outer toes, on the contrary, are characterised by their breadth and depression. The, ungual phalanges, in particular are small, short and flat—features which are in marked contrast with the long, pointed and curved, conical claw-bearing phalanges of the Dinornithidæ, or even of those of the emeu and cassowary. In conformity with the shape of the constituent segments (except

in the case of the inner toe) the surfaces of the phalangeal joints are characterised by their transverse width and low vertical height; by their comparative flatness, and by the insignificance of the depressions for the lateral ligaments—a combination of characters which indicate weakness of the toes, in addition to the shortness and feebleness of the claw-bearing phalanges.

One other important feature remains to be indicated. From all other ratitite forms, and from nearly all other birds, the outer toe of *Genyornis* differs in possessing only four segments in place of five. Of this unusual feature the one of us (A.Z.) who gathered the bones assured himself repeatedly by counting them *in situ*.

*Sternum*.—The restoration of this bone is not yet quite completed, but, so far as can be seen in shape and proportions, it resembles that of the emeu more closely than it does that of the cassowary, while it differs considerably from that of the Dinornithidæ. We think we may confidently assert that neither lateral xiphoid processes nor median post-axial notch exist.

The actual dimensions may be thus approximately stated:—Extreme length, 12 inches; extreme transverse breadth, allowing for a slight deficiency,  $10\frac{1}{2}$  inches. The corresponding measurements of the sternum of the emeu and cassowary (*C. australis*) being respectively  $4\frac{1}{2}$  and 4 inches, and 8 and  $5\frac{1}{2}$  inches.

*Wings*.—By the fortunate recovery of several elements of wings we are able to establish the possession of small appendages of this character for *Genyornis*. The humerus, radius, ulna, two meta-carpals, and one phalanx are represented either by complete bones or by fragments. The whole length is approximately  $9\frac{1}{4}$  inches, and the proportions, on the whole, more nearly those of the emeu than the cassowary.

*Head*.—As to the head, of which both specimens obtained are unfortunately in a very dilapidated condition, we prefer not to speak at present, except to indicate its large size. The total length of the skull is  $11\frac{1}{2}$  inches, that of a large emeu and ostrich being respectively  $6\frac{1}{8}$  and 8 inches.

As concerns the size of the lower mandible, from which feature the bird has received its name, we may mention that the ramus, slightly imperfect at its posterior extremity, is  $10\frac{1}{8}$  inches, and its width at the widest part  $2\frac{1}{2}$  inches. The symphyseal depth is  $1\frac{1}{2}$  inches. For a large ostrich and emeu the corresponding measurements are respectively, in inches,  $7\frac{1}{4}$ ,  $3\frac{1}{4}$ ,  $\frac{5}{8}$ ; and  $5\frac{3}{4}$ , 3,  $\frac{7}{16}$ . The transverse span, posteriorly, of the lower mandible is, at least, 6 inches, while that of the ostrich and emeu is  $3\frac{1}{4}$  and 3 inches respectively.

Thus far, in our brief description, we have made comparisons only with Australian and New Zealand ratitite birds existing and

fossil. Two other extinct forms invite comparison, viz., *Gastornis parisiensis*, from the Eocene beds of Meudon, near Paris, and the *Epyornis maximus*, of Madagascar; but, for the present, we must content ourselves with saying that, though in that characteristic part—the lower end of the tibia—there are points of resemblance between *Genyornis* and *Gastornis*, yet, so far as can be judged by reference to plates and descriptions, which are our only means of comparison in the case of *Gastornis*, we believe the differences in respect both of the characters of the femur and tibio-tarsus, to say nothing of the difference of geological horizon, are sufficient to preclude even a generic association between the two forms.

Between *Genyornis* and *Epyornis* there are many conspicuous points of difference; though it is noteworthy that, in point of great breadth as compared to length, the femur of *Genyornis* makes a nearer approach to that of *Epyornis maximus* than the thighbone of any other bird with which we are acquainted.

#### CONCLUSIONS.

Though in the absence of a careful study of so important a part of the organization as the head, it is perhaps premature to offer decisive opinions as to the habits of the bird or of its affinities with existing members of its group, nevertheless the following conclusions appear to be justified by the survey of its remains so far as this has been made.

The great size of the femur and tibio-tarsus, no less than of its sternum, indicate its massive build, though there is a strange disproportion between the proportions of the upper leg bones and the relatively slender tarso-metatarsus. Its legs combine a huge femur nearly as massive, in all but length, as that of *Dinornis maximus*, and a tibia equalling that of *Pachyornis elephantopus* with the comparatively slender metatarsus of *Dinornis novæ-hollandiæ (ingens)* and toes which are insignificant beside any of the larger moas. The absence of prominent rough surfaces or ridges for muscular attachment, lead one to assign to it a slow sluggish habit. In height it may be confidently stated to have been from 6 feet to 6 feet 6 inches, that is if the neck should have been of proportions similar to those of *Pachyornis elephantopus*. With the large size of the head, however, may be correlated modifications of the neck. The small flat ungual phalanges would appear to have borne flattened nails, rather than sharp and powerful claws, which could have been of little service for scratching purposes and with this feature is associated an evident want of strength in the phalangeal joints.

There is reason to believe that the *Diprotodon* may have been a swamp-loving animal which, tapir-like, may have haunted the shores of the lacustrine areas of Central Australia in Pliocene

times, and the association of the remains of *Genyornis* with those of *Diprotodon* suggest that the bird, too, may have had its haunts, and found its food, by the same swamps as its bulky marsupial associates. The thickness of the lower jaw is scarcely commensurate with its great length and depth, and this fact, with the weakness of the toes, suggest that, like the emeu, herbage, rather than roots, may have formed its food.

In the course of our brief description and comparisons it will have been seen that the resemblance to the emeu, and to a less extent to the cassowary, are many and considerable. The presence of the bony bridge being, however, a conspicuous, if not morphologically important, point of difference. The emeu, in fact, appears to be its nearest ally, though there are points of resemblance, other than in respect of bulk, to the *Dinornithideæ*, and possibly it may be found to the *Gastornithideæ*. We may, perhaps, provisionally regard it as an ancestral form of emeu, possibly having relations to the New Zealand group.

As will be seen in table I. certain differences in size exist between the femora of two individuals, and these are not confined to that bone; but we do not believe that, either in this respect or in the details of structure, there will be found grounds for thinking that more than one species is represented in the Callabonna collection.

Of its relations to existing forms, other than those of the ratitite type which have been mentioned, it is premature to speak; such facts will emerge with greater certainty and completeness on a study of the head, the restoration of which—a long and tedious task—is approaching completion, though, unfortunately, it is in a very imperfect condition. In the meantime we believe we have, in this preliminary notice, sufficiently indicated, though in a manner less complete than we could have wished, the interesting nature of the discovery at Callabonna, not only as affording additional evidence, in so much more complete a form than has hitherto existed, of the wide range in Australia of this race of great extinct birds, but also as bearing upon the phylogenetic relations of the sub-class to which it belongs, as well as, possibly on the question of the former distribution of land in the Southern Hemisphere.

These points, however, must be left to a subsequent communication, and, perhaps, to those with a wider range of knowledge than is possessed by the authors of this paper.

MAR 2 1897

GENYORNIS NEWTONI—A FOSSIL STRUTHIOUS  
BIRD FROM LAKE CALLABONNA, SOUTH  
AUSTRALIA.

DESCRIPTION OF THE BONES OF THE LEG AND FOOT.

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AND  
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Museum.

PLATES III., IV., AND V.

[Read October 6, 1896.]

A preliminary notice of this bird appeared in the Transactions of the Royal Society of South Australia, vol. XX., p. 171. In the present paper we offer the first part of that which, when complete, will be a detailed description of all those parts of the skeleton which we possess. We commence with the bones of the leg, as the restoration of these is now nearly finished. Further notices will appear as other bones become available for description.

*Femur*.—Of these bones three only are in anything like perfect condition. A fourth, though nearly entire, is much flattened by antero-posterior compression, and others are still more distorted or imperfect. That which has principally served as the type for description is No. 3 of Table I. Though the dimensions of this are somewhat smaller than those of the large pair comprising Nos. 1 and 2, it is in a better state of preservation than either of the latter—indeed, save for slight abrasions affecting the summit of the trochanter, and for depressed areas on the upper part of the hinder and the lower part of the front surface, the anatomical details are almost perfect.

The head approximately equals, but does not exceed, the proportions of a hemisphere; and the part corresponding to the neck is but feebly defined by a very trifling constriction, which does not, however, involve the superior aspect. The non-articular part of the under surface of the neck, as it ascends, encroaches somewhat on the otherwise nearly hemispherical head. The depression for the round ligament is shallow, and situated well upon the upper surface of the head (Pl. iii., fig. 3, A). The superior articular surface, after descending from the summit of the head, ascends, as it recedes outwardly to cover the trochanter,

with a very gradual and slightly curved incline\* (Pl. iii., fig. 2 *C*)—a feature which is in marked contrast to the more abrupt and steeper rise of this process in *Dinornis*. Nevertheless, owing to the great lateral width of the upper extremity of the bone and the consequent length of the incline, the summit of the trochanter, even in its slightly abraded condition, reaches to quite as great a relative height above the head, as in the New Zealand birds.

When a proximal view of the superior extremity is presented (Pl. iii., fig. 3) it will be seen that there is no projection posteriorly of the hinder surface of the trochanter, such as there is both in the New Zealand *Dinornis* and in *D. queenslandiæ*. Thus, whereas in the last named birds and, to some extent also, in *Dromornis*, the posterior margin of the upper articular surface forms a well-marked indented curve. In *Genyornis*, however, it forms nearly a straight line up to the point where the contour of the trochanter sweeps forward (Pl. iii., fig. 3, *upper border of figure*). The same figure will indicate the manner in which the mass of the trochanter is projected forwards and outwards (*B*).

In *Dinornis* the pre- meets the postero-external trochanteric surface at an acute angle, and the crest, corresponding to their line of union and terminating below in the ecto-trochanteric tuberosity, is sharp, prominent and laterally compressed. In *Genyornis*, on the other hand, the conditions may, perhaps, be best described as being such as are produced by the inclination towards one another of two plane, or, at most, very slightly concave, surfaces (pre- and ecto-trochanteric) at little less than a right angle, the angle along the line at which these two surfaces meet being at the same time broadly rounded off, instead of forming a prominent crest. Thus, though the anterior production of the trochanter is considerable, the process lacks the lateral compression, which is a conspicuous feature in all the *Dinornis* femora to which we have access. An obscurely indicated rough surface, rather than a distinct ecto-trochanteric tuberosity, marks the subsidence upon the shaft of the anterior trochanteric prominence (Pl. iii., fig. 1 *ET*). The pre-trochanteric surface (Pl. iii., fig. 1 *D*) is nearly flat, and does not present an oblique line or ridge, nor the conspicuous subcircular area for muscular attachment, which is shown in various *Dinornis* femora. The latter feature may, however, be represented by an irregular elevation, obscurely represented in Pl. iii., fig. 1, at the junction of the anterior and inferior surfaces of the neck close to the head.

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\* In Pl. iii., fig. 1, the steepness of the ascent of the trochanteric part of the articular surface is much exaggerated owing to the foreshortening, in the photograph, of the anterior projection of the mass of the trochanter itself.

From the absence of production posteriorly of the trochanter, the width of its postero-external surface is relatively less broad than in *Dinornis* and, though protuberant and roughly striated externally, it presents no marked depressions or elevations. On the outer surface of the trochanter an obscure, obtusely angular ridge runs from its summit obliquely downwards and backwards.

A feebly-marked intermuscular ridge (Pl. iii., fig. 1 *F*) beginning to the inside of the rough surface, which corresponds to the ecto-trochanteric tuberosity (Owen), descends vertically for two inches, and then inclines inwards to merge into a ridge which leads to the front of the ento-condyle. Immediately to the outside of the point where the inclination inwards takes place is a slightly elevated rough surface which is scarcely manifest in the figure.

The posterior surface of the upper expansion of the bone has undergone some amount of distortion by the depression of a considerable area of its outer crust—(Pl. iii., fig. 2 *G*), but the other femora show this tract and, indeed, the whole of the posterior surface to have been very flat. The posterior margin of the upper articular surface, as this begins to rise on to the trochanter, projects considerably so as to form an overhanging ridge. Directly below this ridge is a large deep oval depression (Pl. iii., fig. 2 *H*) which is clearly a pneumatic orifice. Two large foramina, separated by a bony septum, lead from the bottom of the depression into the interior of the bone.

The shaft is remarkably smooth and, with the exceptions above mentioned, is devoid of the prominent muscular ridges, rough surfaces or elevations that characterise *Dinornithine* femora; particularly, on the posterior aspect, is there an absence of *lineæ asperæ*. One very small nutrient foramen is present at about the centre of this surface.

A characteristic feature of this bone is the marked curvature of its internal contour (Pl. iii., figs. 1 and 2) in which respect it contrasts with the more open curve in the femora of *Dinornis* and *Dromornis*. The flatness of the posterior surface has been mentioned; to a hardly less extent the anterior and exterior surfaces are flat also, while the inner is rounded. Thus the transverse section in the middle of the shaft is a pyriform oval with the small end corresponding to the inner surface, or it might almost be described as trilateral.

The lower extremity, of which an area of the crust on the front surface has been depressed (Pl. iii., fig. 1 *G*) is, like the upper, characterised by its great transverse breadth—the smallest of the Callabonna bones exceeding, in this respect, the corresponding measurement of a femur of *Dinornis giganteus* (Owen), in the Museum collection, having a length of 15 inches, while the

similar width in the largest approaches to within half an inch of that of *Dinornis maximus* (Owen) with a length of  $18\frac{1}{4}$  inches. Conformably to the great width of the lower extremity is the breadth of the rotular channel ( $2\frac{7}{8}$  inches) (Pl. iii., fig. 4 *R C*) which also slightly exceeds the breadth of this channel in the femur of *D. giganteus* (Owen). At the same time the channel is, in *Genyornis*, relatively shallow. The anterior intercondylar ridge is very slightly indicated (Pl. iii., fig. 4 *N*), while the posterior is narrow and prominent (Pl. iii., fig. 2 *O*); the region corresponding to the intercondylar fossa is prominent rather than depressed.

Owing to the gentle inclination of the posterior surface of the shaft, as it leads into the popliteal fossa (Pl. iii., fig. 2 *J*), this depression is ill defined as to its superior contours, and the external and internal ridges which bound it laterally are broadly rounded, especially the former. The floor of the fossa is flat, but rough, and there are large pneumatic orifices arranged in a row along the lower margin (Pl. iii., fig. 2, above *O*). The larger depression seen at a higher level is probably accidental, as it does not appear to exist in the other bones. The open and shallow characters of the fossa in this bone contrast with the better defined, oblique, deep and narrow cavity in *D. ornithis*. Commensurate also with the great breadth of the lower end is the width of the ento-condyle (Pl. iii., fig. 4 *IC*), of which the contour of the posterior margin forms nearly a horizontal line (*M*) before it dips suddenly to become the internal margin of the posterior intercondyloid notch (*K*); the contour of this notch forms a U-shaped figure instead of a more open curve.

Of the ecto-condyle (*EC*) the tibial moiety is also relatively wide, exceeding, in this respect, the corresponding part in *Dinornis giganteus*, and the fibular groove, is continued forwards for a considerable distance on to the front of the ecto-condyle; just behind the posterior limits of the groove there is an irregularly elongated ecto-condylar fossa (Pl. iii., fig. 2 *P*). The depression on the outer surface of ecto-condyle is inconspicuous, beside that to be observed on most Dinornithine birds. The ecto-condyle, moreover, when the bone is held vertically reaches a considerably lower level ( $1\frac{1}{4}$  inch) than the ento-condyle; thus to place the bone in the position that the most inferior part of each condyle rests upon the same horizontal level involves a very considerable obliquity of the shaft.

Except in respect of size, all the Lake Callabonna femora resemble one another so exactly, that there can be no doubt that they belong to the same species. We have elsewhere expressed the opinion\* that two fragments of femora from

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\* Trans. R. Soc., S.A., vol. XX., p. 175.



Normanville and Baldina Creek, S.A., are also to be attributed to the same bird, but it should be stated that, though corresponding with the Callabonna femora in all anatomical details which are available for comparison, the former fragments are parts of bones of distinctly less size than the smallest of the latter, as shown by the fact that their circumference, at the part corresponding to the mid point of the entire bone, is nearly an inch and a half less. In the portion from Baldina Creek, however, enough of the bone exists to permit of a comparison in many details, and in these as stated, no essential differences can be detected.

TABLE I.

Showing dimensions of femora of *Genyornis newtoni* compared with those of some other femora.

—	Length.		Breadth of proximal end.		Breadth of distal end.		Circumference at middle.	
	Inches.	Mm.	Inches.	Mm.	Inches.	Mm.	Inches.	Mm.
<i>Genyornis newtoni</i> , No. 1	13 $\frac{3}{8}$ *	339	6 $\frac{3}{8}$ *	161	7	177	9 $\frac{1}{4}$	234
<i>Genyornis newtoni</i> , No. 2	13 $\frac{3}{8}$ *	345	7 $\frac{1}{8}$	180	6 $\frac{3}{4}$	171	9 $\frac{1}{4}$	234
<i>Genyornis newtoni</i> , No. 3	13*	322	6 $\frac{3}{8}$	161	6 $\frac{3}{8}$	161	8 $\frac{3}{4}$	218
<i>Dromornis australis</i> , Owen	11 $\frac{1}{2}$ *	291	5 $\frac{1}{4}$ *	133	5	126	6 $\frac{3}{4}$	171
<i>Dinornis maximus</i> , Owen	18 $\frac{1}{4}$	462	6 $\frac{1}{2}$	164	7 $\frac{1}{2}$	190	9 $\frac{1}{2}$	240
<i>Dinornis elephantopus</i> , Owen ...	13	329	5 $\frac{1}{2}$	147	5 $\frac{1}{2}$	149	7 $\frac{3}{4}$	196
( <i>Pachyornis elephantopus</i> Lydekker) ...								
<i>Apyornis maximus</i> , I. Geoffroy ...								
	12 $\frac{5}{8}$	320	6 $\frac{5}{8}$	170	7 $\frac{1}{2}$	190	10 $\frac{5}{8}$	270

For convenience of reference the measurements are given both in inches and millimetres.

The asterisk indicates that the measurements so marked are slightly curtailed by reason of abrasion of the bones.

Nos. 1 and 2 of *Genyornis* represent a pair of bones—the largest in the collection.

The measurements of *D. maximus* and *D. elephantopus*, are from Professor Owen's Table of Measurements, Trans. Zool. Soc., vol. VIII., p. 371; those of *Apyornis* from Oiseaux des Iles Mascareignes A. Milne Edwards, p. 96; and those of *Dromornis* partly from Owen's description, Extinct Wingless Birds of New Zealand, Appendix p. 2, and partly from a cast.

*Tibio-tarsus*.—Of these bones two only, viz., those belonging to the large pair of femora, Nos. 1 and 2 of Table I, are undis-

torted and nearly perfect, having suffered only some abrasion of the procnemial crest; in two others the full length has been preserved, but they are considerably crushed and distorted. In four it has been possible to restore the whole length of the shaft, but the processes of the upper extremity are absent. The remainder, sixteen in number, are represented only by the lower end, usually in good condition, with more or less of the shaft.

The ento-condylar surface (Pl. iv., fig. 5, *I C*) is suboval and nearly flat in its longer axis, which is directed obliquely from behind forwards and inwards. In the shorter axis it is slightly concave.

The ecto-condyle (Pl. iv., fig. 5, *E C*) is smaller in size, markedly convex, and oval, with its longer axis nearly at right angles to that of the entocondyle. An ill-defined intercondylar channel, scarcely to be distinguished in the figure, separates these two surfaces posteriorly and follows the contour of the ecto-condyle in a direction forwards and outwards to the ecto-cnemial cavity. (Pl. iv., fig. 5, *J*). There is a prominent smooth intercondylar eminence (Pl. iv., fig. 5, *A*) the inner slope of which forms part of the entocondylar surface. The eminence also bounds the intercondylar channel in front and, in part, the cnemial or rotular channel (*B*) posteriorly. The posterior margin of both articular surfaces overhang the shaft considerably.

In front of the cnemial channel, which is wide and shallow, the massive cnemial process (Pl. iv., figs. 1, 3, 4, 5) rises to nearly three inches, measured vertically, above the level of the articular surface, this great height of the process being contributed to by the extension of the upper end of the procnemial ridge above the level of the epicnemial crest (Pl. iv., figs. 1, 3, 4 *F*). The procnemial ridge is thick at its upper part, but soon narrows as it descends to a much laterally compressed crest (Pl. iv., figs. 1, 3, 5, *F*), which, even in its somewhat damaged condition, is very prominent; this is continued down the front of the shaft to a point nearly six inches below its summit. About this point the crest subsides to a low, but still well marked, ridge, which is continued obliquely downwards and inwards till it almost reaches the inner margin of the anterior surface of the shaft at a little below the middle of the bone (fig. 1, *K K*). From this level the ridge extends vertically downwards for about four inches, but with diminished prominence, lying just external and parallel to the inner margin of the front surface of the shaft. Finally the ridge acquires increased prominence, inclines outwards and eventually becomes continuous with the inner border of the supracondylar extensor groove (figs. 1, 6, *L*).

The epicnemial crest (using the term to include the whole upper border of the cnemial process, exclusive of the procnemial

summit), when viewed superiorly, forms an open sigmoid curve (Pl. iv., fig. 5, *E E H*), which is so inclined that its lower and outer end is considerably below the level of its upper and inner. The former end terminates by a marked backwardly directed curve (*H*). In fact, the external angle of the cnemial process might be described as forming a backwardly directed hamular process, the inferior border of which forms the beginning of the ectocnemial ridge (Pl. iv., figs. 1, 4, *H G*). This ridge, or crest, is continued downwards, with an inward trend, to a point which lies about four inches below the point of the hamular process; here it subsides upon the shaft, having at its termination approached to within an inch of the procnemial ridge.

Internally the cnemial process is bounded by a thick and rounded border (Pl. iv., figs. 3, 5 *D*) formed by the meeting of its posterior surface with the internal surface of the procnemial crest. This border descends abruptly from the summit of the process, but with an inclination backwards and inwards (figs. 3, 5, *D*). On meeting the upper expansion of the bone this descending border becomes continuous with the adjacent, somewhat elevated and ridge-like anterior margin of the inner part of the rotular channel. There is thus no considerable extension of the epicnemial crest beyond, and to the inside of, the procnemial as in *Dinornis*; the latter ridge, in fact, springs from the interior surface of the former quite close to the thick and abruptly descending inner border that has been described.

Owing to the posterior incurvation of the angle formed at the junction of the epicnemial and ectocnemial crests, the ectocnemial cavity lying between this angle and the outer margin of the ectocondyle forms a deeply indented bay (fig. 5, opposite *J*), of which the arms approach one another to within two and a half inches.

No distinct supra-fibular facet is observable; in fact, when the fibula, which nearly certainly belongs to one of the large pair of tibio-tarsi, is placed in position, the head of the former does not touch that of the latter by nearly half an inch. The fibular ridge begins, as a low rising, two inches below the overhanging external edge of the ectocondylar surface, the interval being smooth and deeply concave in a vertical direction. An inch and a half below its beginning the ridge widens into a rough and nearly flat elevated surface, of fusiform outline, for articulation with the fibula (Pl. iv., fig. 4, *O O*). This surface, which is four inches long by five-eighths of an inch broad, appears to represent the whole extent of the direct articulation between the two bones. A smooth interval of about an inch succeeds this surface, and below this again an ill-defined broad, rough ridge that represents the external surface of the shaft, proceeds to the lower outer condyle. The opening of a larg

nutrient artery, directed distalwards, and to which a groove leads from above, lies just behind the lower end of the articular surface that has been described.

On the antero-internal aspect of the upper expansion of the bone an obtusely angulated ridge descends for four inches from the corresponding margin of the articular surface. This ridge terminates in a roughened convex tuberosity (Pl. iv., fig. 2, *P*). The tract between this ridge and the procnemial crest is nearly flat, or only very slightly concave in its upper part, where the surface is uninjured; the lower part has suffered some depression from injury.

Above the level of the (lower) fibular articulation the shaft is sub-quadrangular in shape, and at the same time somewhat antero-posteriorly compressed. This latter characteristic continues throughout the rest of the shaft, but below the fibular surface the sub-quadrangular section becomes more of a pyriform oval, the smaller end being external; at the lower end the section tends to become again somewhat quadrilateral. The lateral width which, at the upper level of the fibular articulation, is  $3\frac{1}{8}$  inches, diminishes in the descent to  $2\frac{1}{8}$  inches at the narrowest part of the bone, which is 5 inches above its lower end; below this there is a slight increase of width as the shaft expands into the condyles. There is also a slight diminution of the antero-posterior diameter of the shaft in passing from above downwards.

At a little above the point at which the bone has been described as narrowest, laterally, there begins a marked deflection inwards of the lower end of the shaft, and the inflection affects the inner border to a greater extent than the outer. The result is to cause a considerable production inwards of the inner condyle. There is, at the same time, a slight but marked deflection forwards of the lower extremity. These features are shown in the whole length figures of the bone.

Of the lower expansion the inner condyle projects more, both anteriorly and posteriorly (Pl. iv., fig. 7), particularly in the former direction, than the outer. The whole antero-posterior width is also greater than that of the latter, (93 mm. to 73 mm.). In lateral width the condyles are nearly equal. Held with the long axis perfectly vertical, the ectocondyle reaches a slightly lower level than its fellow. (Figs. 1, 2).\*

When the two condyles are held at the same horizontal level their articular surfaces ascend in front to about the same level, but the upward extension of the inner, besides its greater prominence anteriorly, preserves a more uniform width than that of the outer, which latter becomes in its upper part reduced to a

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\* In Fig. 6, the axis is not quite vertical.

narrow tract (Fig. 6.) The superior contour line in front of the conjoined articular surfaces, though sufficiently distinct to form the inferior boundary of the supracondylar space, does not form a so marked a ridge as in *Dinornis*. Posteriorly, the corresponding contour line (not very distinctly marked and not distinguishable in Fig. 2) slopes downwards and inwards from the summit of the outer condylar region to that of the inner where it becomes continuous with the compressed and projecting postero-external ridge in which the inner condyle terminates behind.

When viewed from below the intercondylar channels, in front and behind, yield contours, the forms of which are seen in Pl. iv., fig. 7. The same figure shows the greater extent of the anterior production of the inner condyle, but it does not show very conspicuously another character which is to be noticed, viz., the greater lateral width of the whole trochlear surface in front than behind, the last-mentioned feature being due to the fact that, as the infero-internal border of the inner condyle sweeps backward it also inclines outwards, trending towards the corresponding border of the other side, the curve of which scarcely departs from a true antero-posterior plane. The degree of curvature of the inferior contour of the trochlear surface is shown in Figs. 1, 2, 6.

The greater part of the front of the inner surface of the ento-condyle is occupied by a large gibbous or nearly oval depression, of which the margin anteriorly and inferiorly comes right up to the edge of the articular surface. (Pl. iv., fig. 3, *Q*.) Behind the depression, about midway between the anterior and posterior border of the condyle, is an obtusely rounded, epicondylar, tuberosity (Fig. 3, *R*) which is not very prominent, and scarcely projects beyond the plane of the lower border of the condyle.

The external surface of the outer condyle (Fig. 4, *E C*) is nearly flat, or only very slightly concave, over its whole extent, and possesses no epicondylar tuberosity.

The supra-condylar extensor groove (*M*) may be discerned as commencing about six inches above the condyle on the outside of the ridge (*K*) described as leading downwards from the termination of the procnemial crest. The ridge is, in fact, continuous with the inner border of the groove. (Fig. 6, *KL*).

As the groove descends it deepens, and inclines outwards until it reaches the mid line, at which point it is spanned by the bridge (fig. 6, *S*). At this level the groove is deflected inwards at a somewhat abrupt angle, and below the bridge the groove is distinguishable as a broad, shallow canal, which emerges into the wide, but not deep, supra-condylar fossa. Of the borders of the groove, the inner (*L*) is the more prominent and rugose, and the outer (*M*) smooth. The bridge itself, median in position, and

placed very obliquely, stands prominently forward, especially in regard to its lower edge.\*

The width of the bridge is 15 mm. at its outer end, from which point the breadth increases towards the inner side, the increase being due to the increasing obliquity of the upper border. Owing to the loss of a small piece which has been chipped out of the upper border near the inner pier the width at this end cannot be exactly stated, but would appear to have been 19 mm. The lower border of the bridge is considerably thicker than the upper, and somewhat everted. The lower outlet is oval, and its plane looks downwards and inwards, while the upper outlet forms a shorter, as well as narrower, oval than the lower.

In the canal covered by the bridge is a large pneumatic foramen which encroaches on the outer pier.

Close to the outer edge of the bone, and on a level with the outer pier, is a rough, obtusely conical tuberosity. (Fig. 6, *T*). In conformity with the more median position of the bridge, as compared with *Dinornis*, that tract of the lower expansion which lies internal to this structure, is much wider in *Genyornis* than in the New Zealand genus, and the continuation of this tract below the bridge, which forms the incline into the supra-condylar fossa, is in the former broad and somewhat transversely convex, in contrast to the condition in *Dinornis*, where it is pinched into more or less of a ridge. The distance from the middle of the lower border of the bridge to the nearest point of the internal condyle is 28 mm.

The dimensions of one of the large pair of tibio-tarsi are shown in Table II. Owing to the absence, or distortion, of parts of the upper end, it is impossible to state accurately the length in the great majority of specimens. That feature which is most perfectly preserved in nearly all of them is the lower end, and we therefore use the lateral width dimension of this for the purposes of comparison in point of size. We find that, among 24 tibio-tarsi in which perfection of the lower end permits accurate measurement to be stated, the width varies from four inches in the largest example to three and a quarter in the smallest. All but eight have a greater measurement than three and a half inches, and in none of the bones is there any evident sign of an immature condition.

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\* The bridge is absent in both the large and nearly perfect pair of tibio-tarsi, and, in fact, from all but four of the specimens. The details respecting it are therefore taken from another specimen (that represented in fig. 6), comprising only the lower extremity and part of the shaft. In this the feature in question is perfect except for a small piece which has been chipped out of its upper border. *Vide* Trans. Roy. Soc. S. A., Vol. XX., p. 185.

TABLE II.

Showing dimensions of tibio-tarsus of *Genyornis newtoni* in comparison with those of the tibio-tarsi of *Dinornis elephantopus*, Owen (*Pachyornis elephantopus*, Lydekker), and *Apyornis maximus*.

—	Length.		Breadth of proximal end.		Breadth of distal end.		Circumference of middle.	
	Inches.	Mm.	Inches.	Mm.	Inches.	Mm.	Inches.	Mm.
<i>Genyornis newtoni</i> ...	23 $\frac{3}{4}$	602	7 $\frac{5}{8}$	193	4	101	6 $\frac{3}{4}$	171
<i>Dinornis elephantopus</i> , Owen ...	24	608	7 $\frac{5}{12}$	187	4 $\frac{1}{6}$	105	6 $\frac{5}{12}$	162
<i>Apyornis maximus</i> , Geoffroy ...	25 $\frac{1}{4}$	640	7 $\frac{1}{2}$	190	5 $\frac{5}{16}$	135	6 $\frac{1}{4}$	158

The *Genyornis* tibia belongs to one of the large pair of femora of the preceding table. The measurements of that of *Dinornis elephantopus* are from Owen's tables and those of *Apyornis* from Milne Edwards's work previously quoted, p. 93.

*Fibula*.—(Pl. iv., figs. 8, 9.) This bone presents the usual laterally sub-compressed and backwardly produced head. The superior articular surface—that upon which the femur plays—is an elongated oval, slightly concave antero-posteriorly, and nearly flat transversely. It is not coextensive with the whole upper surface of the head, but leaves a non-articular area in front which slopes more abruptly downward and forward. Lying obliquely athwart the internal surface of the head is an elongated depression or groove (Fig. 9, A) which is directed towards the edge of the articular surface of the tibio-tarsus, though the absence of a distinct corresponding facet on that bone has been mentioned. Externally the head is also slightly concave in antero-posterior direction.

The upper part of the shaft is sub-compressed in the same direction as the head, but soon becomes sub-circular in section. A little below the head on the anterior surface is a small tuberosity. With the commencement of the lower articular surface for the tibio-tarsus, about 5 inches below the summit, the shaft increases in size, becoming at the same time sub-triangular in section, the outer surface being convex, the postero-internal nearly flat, and the anterior somewhat concave.

The lower articular surface for the tibio-tarsus (Fig. 9, B) is an elongated rough area about three inches in length, which at its upper part is provided at the expense of the internal angle of the, in this situation, trilateral shaft, but as it descends it encroaches more and more upon that surface of the shaft de-

scribed as postero-internal till it comes to occupy nearly its whole width. A rough oval tuberosity (Figs. 8, 9, *C*) is developed upon the posterior border of the shaft a little below the level of the commencement of the articular surface, and below this there is a gradual reduction in the size of the shaft which, moreover, loses its trilateral character. Below the articular surface the shaft assumes the form of a cone, which in most of the specimens tapers rather abruptly to a blunt point. In the longest specimen the taper is more gradual, and the length below the articular surface, in this, is consequently greater.

The length of a large fibula, apparently complete as to its length, and of about the same size as an imperfect specimen belonging to one of the large tibio-tarsi, is  $9\frac{7}{8}$  inches, while that of the smallest is  $8\frac{1}{2}$  inches. The antero-posterior diameters of the heads of these two bones, measured obliquely in the direction of the longer axis, are  $2\frac{7}{16}$  inches and 2 inches respectively. Seven fibulae, only, were collected, but these are all in good preservation with the exception of the lower pointed extremity, which is broken off in most of them.

*Tarso-metatarsus*.—The ecto-condylar surface (Pl. v., fig. 3, *E C*) is subquadrangular and flat, with a slight slope downwards as it extends outwards. That of the ento-condyle (fig. 3, *I C*) somewhat exceeds a semicircle in shape; its transverse diameter is about equal to, and the antero-posterior diameter greater than, those measurements in the ecto-condyle. In the latter diameter it is slightly concave, and in the former greatly so, this character being principally due to the elevation of the inner margin into an elevated lip or crest (*A*), which rises a little higher than the anterior entocondylar process. This crest frequently exhibits a slight, externally directed curvature (fig. 1, *A*). The intercondylar tract, marked at about its centre by a shallow depression, rises in front into an obtusely angulated intercondylar process (fig. 1, *B*).

On the posterior aspect of the upper extremity there is a single thick, prominent and undivided hypotarsus (Pl. v., fig. 2, *C*) which rises above the articular surface as a sub-conical prominence, and reaches a somewhat greater elevation than the anterior intercondylar process. The inner surface of the hypotarsus is marked by a shallow groove which begins a little below its summit and curves somewhat forwards as it descends. This groove disappears under a broad but thin bridge of bone (fig. 2, *D*) which covers the opening of the posterior ent-interosseous canal, and below this it continues more or less distinctly for some distance down the postero-internal surface of the shaft.

The hypotarsus extends, mesially, down the shaft as a broad angular ridge with gradually diminishing elevation, which, how



ever, may be traced to within two inches of the posterior limits of the mesotrochlea. As the ridge subsides a shallow groove commences on its inner side (fig. 2, *G*), which leads to the inner trochlear interspace.

On the front surface of the upper expansion there is a large interosseous depression, with declivous sides (Pl. v., fig. 1, *E*), the upper margin extending to within about an inch and a half of the summit of the anterior intercondyloid process. At the bottom of this pit are the anterior openings of the interosseous canals. Immediately below this depression, and encroaching upon its inferior slope, is a rough vertically striated surface for attachment of the tibialis anticus (fig. 1, *between E and F*). Immediately below this rough surface is the upwardly directed opening of a nutrient artery (fig. 1, *F*), to which a slight groove leads from below.

Above the large depression into which the interosseous canal opens anteriorly, the surface of the bone is transversely concave, and below it, also, the whole of the front surface of the shaft is occupied by a wide groove which becomes narrower and shallower as it descends; at a little below the middle of the shaft the groove has disappeared, and the front surface is flat transversely, below this, again, the same surface becomes more and more transversely convex with the increasing prominence of the meso-tarsus. An ill-defined shallow groove on the front surface of the lower third of the shaft, scarcely to be distinguished in the figure, leads to the outer intertrochlear interspace.

On the outer surface of the head there is a prominent, antero-posteriorly flattened keel-like process (Pl. v., figs. 1, 3 *H*) which commences a little below the outer margin of the articular surface, and extends downwards as a crest or ridge for from 2 to  $2\frac{1}{2}$  inches. This crest and its ridge-like continuation forms the posterior boundary of a shallow groove upon the upper part of the outer surface of the ecto-metatarsus.

The outer side of the hypotarsus, is the large posterior opening of the ect-interosseous canal (Fig. 2., *J*). The opening of its fellow on the opposite side is, as has been stated, concealed by a bridge of bone. The upper-margin of the bridge is above, and the lower below, the level of the eclinterosseous canal.

Owing to the shape and prominence of the hypotarsus, the upper half of the tarso-metatarsus yields a trilateral, indeed almost an equilateral, section, the front surface however being reëntrant owing to its deep grooving. With the subsidence of the hypotarsal ridge, the trilateral section passes into an oval, of gradually increasing transverse diameter, as the shaft descends. In the middle third the postero-external surface is marked by an obscure vertical ridge.

There is no trace of the attachment of a hallux.

Of the three trochleæ (*L M K*) the median (*M*) is conspicuously the largest, the external (*K*) the next in size, and the internal (*L*) the smallest. The width proportions being, in a bone  $13\frac{3}{4}$  inches long, 43 mm., 31 mm., and 14 mm. respectively. Their prominence anteriorly, and production inferiorly, are in the same order, though it is only the meso-trochlea which is produced, and that to a slight degree, beyond the plane of the anterior surface of the shaft. Posteriorly all three trochleæ are produced to about the same level and to the extent of little more than half an inch beyond the plane of the posterior surface of the shaft immediately above them.

The meso-trochlea is widest about the level of the tip of the ento-trochlea, the width, however, diminishing considerably from this point both as its surface extends upwards and backwards. The articular surface of this segment bears a well-marked vertical groove, plainly represented in figs. 1, 2, and 4, extending from its commencement to its termination; its lateral surfaces, especially that on the outer side, are concave. Of the ecto-trochlea the anterior surface slopes backwards as it extends outwards, and bears a very slightly marked shallow groove, barely observable in the figures. Like the meso-trochlea, it diminishes in width from the commencement to the termination of its articular surface; its inner surface is concave, and on its outer surface is a subcircular depression. The small ento-trochlea preserves nearly the same width throughout its contour; its surface is convex transversely; its outer aspect is somewhat concave, and on its inner is a small, shallow depression. Corresponding to the diminishing width, posteriorly, of the trochleæ themselves the trochlear interspaces are wider behind than in front, and that between the middle and outer segment reaches to a higher level than its fellow.

Just above the ecto-trochlear interspace are two foramina, situated vertically above one another; the lower is separated from the summit of the interspace merely by a bar of bone,\* while the other perforates the whole thickness of the lower expansion. The anterior orifices of both of these are shown in Pl. v., fig. 1, *N.*; in fig. 2 the posterior orifice of the upper one only is visible (*N*). The shallow groove, described as existing on the lower part of the front surface of the shaft, leads towards the upper of these foramina. In one specimen, only, a similar foramen exists between the meso- and ento-tarsus just above the internal trochlear interspace at a level corresponding to that of the upper of the two perforations on the other side.

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\*In a good many specimens this bony bar which forms the lower boundary of the lower foramen has broken away.

Of the tarso-metatarsi collected twenty-one have been restored to a nearly perfect condition, and to nearly all of these almost complete sets of phalanges can be assigned.

TABLE III.  
Showing comparative measurements of tarso-metatarsi of  
*Genyornis newtoni*, *Dinornis ingens*, Owen, *Dinornis gracilis*,  
Owen.

	Length.		Circumference at middle.		Breadth (transverse) of distal end.		Breadth (transverse) at middle.		Antero-posterior breadth at middle.		Transverse breadth of proximal end.	
	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.	Ins.	Mm.
<i>Genyornis newtoni</i> , No. 1; largest specimen	14 $\frac{3}{4}$	374	5 $\frac{1}{2}$	139	3 $\frac{7}{8}$	98	1 $\frac{7}{8}$	47	1 $\frac{5}{8}$	41	4*	101
<i>Genyornis newtoni</i> , No. 2; medium specimen	13 $\frac{3}{4}$	348	5 $\frac{3}{8}$	155	3 $\frac{1}{2}$	88	1 $\frac{7}{8}$	47	1 $\frac{1}{2}$	38	3 $\frac{3}{4}$	95
<i>Genyornis newtoni</i> , No. 3; smallest specimen	12 $\frac{5}{8}$	320	4 $\frac{3}{4}$	120	3 $\frac{1}{2}$	88	1 $\frac{1}{2}$	38	1 $\frac{5}{16}$	33	3 $\frac{7}{8}$	98
<i>Dinornis ingens</i> , Owen	13 $\frac{3}{4}$	348	4 $\frac{1}{2}$	114	4 $\frac{1}{2}$	114	1 $\frac{1}{2}$	40	1 $\frac{1}{4}$	32	3 $\frac{1}{2}$	88
<i>Dinornis gracilis</i> , Owen	13	329	4 $\frac{1}{4}$	107	4 $\frac{1}{4}$	107	1 $\frac{1}{2}$	40	1 $\frac{1}{6}$	30	3 $\frac{1}{2}$	84

\* Measurement slightly reduced on account of abrasion.

The *Genyornis* tarso-metatarsus (No. 1) belongs to the large femur and tibio-tarsus of the preceding tables. The measurements of the *Dinornis* bones are from Owen's table.

*Phalanges*.—As recorded in the preliminary notes on this bird,\* while the inner and middle toes possess the normal number of segments—three and four respectively—the outer possesses only four in place of the usual number of five. Of this fact there can be no doubt, as they were repeatedly counted in situ; and, moreover, amongst the large number of sets of phalanges collected, there are none that would supply, or correspond to, the missing segment. In this connection it is interesting to note that Pro-

\* Trans. Roy. Soc. of S.A., Vol. XX., p. 188.

fessor Hutton mentions *Euryapteryx gravis*, Haast (= *Dinornis gravis*, Owen = *Emeus gravipes*, Lydekker) and *Euryapteryx ponderosa*, Hutton, as, also, possessing only four phalanges in the outer toe. Trans. N.Z. Institute, Vol. XXVIII., 1895, p. 637.

The extreme length of the three proximal phalanges, in a set of bones belonging to a right tarso-metatarsus  $14\frac{1}{2}$  inches long, which were selected for description both on account of their perfection and of the fact that all the bones almost certainly belong to one another, are II., 1, 83 mm., III., 1, 74, mm., IV., 1, 68; the length of the proximal phalanx of the inner toe is thus a characteristic feature of the foot. Besides its great relative length, Phalanx II., 1, is further characterised by its comparative slenderness and the lateral compression of the greater part of the shaft. (Pl. v., figs. 1, 2, II.) Its proximal articular surface forms a regular concave oval with the long axis vertical. (Fig. 5 II.) This elongated oval form of the articular surface determines the shape of the section of the proximal part of the shaft in which the lateral compression is most marked. From this distalwards, owing chiefly to the inclination of the superior border towards the inferior, the long vertical axis of the proximal part gradually diminishes until the section, just short of the distal articular expansion, becomes a figure that would be nearly circular but for some flattening of the inferior surface. The external surface is distinctly flatter than the internal, and on each side of the distal expansion is a shallow depression, that on the internal face being the smaller. The distal articulation forms a trochlear surface, of which the convexity, in a vertical direction, forms considerably more than a semicircle; transversely, it is slightly concave in its upper part, and markedly so inferiorly.

*Phalanx II., 2*, has an almost quadrangular outline when viewed superiorly. The section of the proximal articulation is subtriangular, of which one angle is superior, and the base opposite somewhat convex inferiorly and produced further backwards than the angle above it. The upper surface is somewhat saddle-shaped, being slightly concave longitudinally, and convex transversely, while the undersurface is slightly concave in both axes. The section, in the middle of the bone, thus forms a segment of a circle less than a semicircle. The distal articulation is somewhat crescentiform, of which the inferior margin, corresponding to the concavity, slopes backwards, and encroaches on the under surface of the bone. Small vascular canals exist on both superior and inferior surfaces.

*Phalanx II., 3*—the ungual phalanx—is a segment of variable length, but usually very short and depressed, slightly curved, and obtusely pointed, having on each side a more or less continuous vascular groove.

*Phalanx III.*, 1, is distinguished by the height and breadth of its proximal, and the breadth and depression of its distal, end. The contour of the proximal articulation, of which the two principal diameters are nearly equal, is shown in Pl. v., fig. 5 II. Generally a low vertical elevation, present only in the inferior half, indicates a partial division into two facets, of which the inner is rather the larger. From the superior and inferior borders of this surface the upper and under surfaces of the shaft incline towards one another, the inclination being greater in the latter. In the middle of the bone the section is a transversely elongated oval, which becomes more flattened towards the distal end. On the under surface, a little in advance of the articular border, are two rough elevations which leave a shallow trough between them. The distal expansion is almost of the same lateral width as the proximal, but between the two ends the shaft is considerably narrower. The distal articular surface forms a trochlea, of which the convexity in a vertical direction exceeds a semicircle. A shallow median groove which extends in the same direction throughout its whole extent divides it into two convexities of about equal lateral width, though, in vertical depth, the inner considerably exceeds the outer. The lateral surfaces of the distal expansion are occupied by depressions, of which the inner is the larger.

*Phalanx III.*, 2, approximates to a quadrangular contour when viewed from above, the length, however, being somewhat greater than the breadth. Its proximal articular surface is ovoidal, with the larger end internal. A very slightly marked vertical rising obscurely indicates a division into two facets, both of which are concave vertically. Of these, the inner facet is slightly the larger. The shaft is very greatly depressed, the lateral diameter, just posterior to the distal expansion, being to the vertical as 31 mm. to 9 mm. The distal expansion itself is also characterised by great breadth and small vertical height; its articular surface, which extends further back below than above, forms a trochlea, the groove separating the two convexities being very broad and shallow, and the inner moiety slightly the deeper in a vertical direction. A shallow depression for the lateral ligament exists on the outer side of the distal expansion, but it is only feebly indicated on the inner. There may be one or more nutrient foramina on the under surface.

*Phalanx III.* 3 is considerably broader than long, in the proportion of 34 mm. to 18 mm., and much depressed. The proximal articulation is reniform with the convexity superior and, owing to a slight posterior production of the superior and inferior borders, particularly of the latter, this surface is concave vertically and mesially, but nearly flat on each side. The anterior

articular surface is sub-reniform, convex vertically, and slightly encroaches upon the inferior surface. The superior surface of the phalanx is rough and somewhat convex transversely, and the inferior is concave in both directions.

*Phalanx III.* 4. — This unguis phalanx, which forms an irregularly oval, concavo-convex plate, is broader than long, and does not greatly exceed in length that of its predecessor in the series. The plane of its proximal surface is inclined downwards and forwards, so that it encroaches on the under surface of the bone. The anterior border is broadly rounded. Two large vascular channels, the opening of one of which can be seen in fig. 6, enter just above each basal angle, and are directed forwards.

*Phalanx IV.* 1. — This segment has somewhat the same form as III. 1 on a smaller scale, the widths of the two bones at their middle points being as 21 mm. to 31 mm., and the lengths, as previously quoted, 68 mm. to 74 mm. Its proximal articular surface (Pl. vi., fig. 5, IV.) is concave and subtriangular with the base inferior. The external angle, at the base, being more prominent than the internal. From each of these angles a rough, rounded ridge is continued forward, on the under surface, for a short distance. The upper surface is convex transversely, the inferior nearly flat, and the section at its middle nearly semi-circular. The distal expansion is depressed and has an articular surface of a form very like that of III. 1, except that the vertical depths of the two convexities of the trochlea are nearly equal. There is a depression on each of its lateral surfaces.

*Phalanx IV.*, 2, is much depressed, with a contour and form resembling those of III., 2, only of considerably smaller dimensions.

*Phalanx IV.*, 3, is similar in contour and form to III., 3, but much smaller.

*Phalanx IV.*, 4, is a slightly curved, small unguis phalanx, a little longer than broad; rather larger and more obtusely pointed than II., 3. Just in front of the angles at the base are grooves which lead into vascular canals, which continue forwards in the substance of the bone. Smaller vascular perforations on both upper and under surfaces.

The segments of III. can be at once distinguished by the great breadth and depression of all but the proximal end of the first phalanx. Those of IV. have a general resemblance in form to the corresponding elements of III., but are only about two-thirds the width. The great relative length, slenderness and compression at once indicates II., 1. Ph. II., 2, has the general contour characters of IV., 2, but has only about two-thirds the breadth, and has not the same definite trochlea for its distal articulation

II., 3, is the smallest, and generally the most pointed of the ungual phalanges.

Considered collectively the characteristics of the toes are the depression of the phalanges and of the articulations, with the exception of those with the tarso-metarsus; the length, slenderness and compression of the proximal phalanx of the inner toe; the inconsiderable degree of concavity of the proximal articulation surfaces, due in great part to the absence of that production posteriorly of the central part of the superior and inferior borders which exists to a marked degree in the phalanges of the emeu, and to a less, though still to a considerable, degree in *Dinornis*, and which, when present, must contribute materially to the strength of the joints. So also the absence of deep vertical grooving of the distal trochleæ and the shortness, depression and feebleness of the ungual phalanges of *Genyornis* are additional characters which indicate weakness of the toes and a want of security in their joints.

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#### EXPLANATION OF PLATE III.

*Genyornis newtoni*.:—Femur (left); figs. 1-4.

- Fig. 1. Anterior surface.  
 2. Posterior surface.  
 3. End contour of proximal extremity.  
 4. End contour of distal extremity.

In figs. 3 and 4 the upper margin corresponds to the posterior surface.

#### INDEX TO LETTER REFERENCES.

- A* Depression for round ligament.  
*B* Trochanter.  
*C* Trochanteric articular surface.  
*D* Pre-trochanteric surface.  
*E* Ecto-trochanteric surface.  
*EC* Ecto-condyle.  
*ET* Ecto-trochanteric tuberosity.  
*F* Intermuscular ridge  
*G.G* Depressed areas.  
*H* Pneumatic foramen.  
*IC* Ento-condyle.  
*J* Popliteal fossa.  
*K* Posterior intercondylar notch.  
*L* Fibular groove.  
*M* Posterior border of ento-condyle.  
*N* Anterior intercondylar ridge.  
*O* Posterior intercondylar ridge.  
*P* Ecto-condylar fossa.  
*RC* Rotular channel.

All the figures are half size.

## EXPLANATION OF PLATE IV.

*Genyornis newtoni*:—Tibio-tarsus (right); figs. 1-7.

- Fig. 1. Anterior surface.  
 2. Posterior surface.  
 3. Internal surface.  
 4. External surface.  
 5. End contour of proximal extremity.  
 Figs. 1-5 represent one of the largest pair in the collection (No. I. of table I.)  
 6. Anterior surface of lower end of another and rather smaller specimen in which the extensor bridge has been well preserved.  
 7. End contour of distal extremity. The upper margin corresponds to the anterior surface.

## INDEX TO LETTER REFERENCES.

- A* Intercondylar eminence.  
*B* Rotular or cnemial channel.  
*C* Cnemial process.  
*D* Inner border of cnemial process.  
*E* Epi-cnemial crest.  
*EC* Ecto-condyle (of both upper and lower ends).  
*F* Pro-cnemial crest.  
*G* Ecto-cnemial crest.  
*E* Hamular process of ecto-cnemial crest.  
*EC* Ento-condyle (of both upper and lower ends).  
*J* Ecto-cnemial cavity.  
*K* Continuation of pro-cnemial crest.  
*L* Inner border of extensor groove.  
*M* Outer border of extensor groove.  
*O* Articular surface for fibula.  
*P* Tuberosity.  
*Q* Ent-epicondylar depression.  
*R* Ent-epicondylar tuberosity.

Fibula (left); figs. 8 and 9.

- Fig. 8. External surface.  
 9. Internal surface.

## INDEX TO LETTER REFERENCES.

- A* Depression on inside of head (upper articular surface).  
*B* Lower articular surface.  
*C* Tuberosity.

All the figures are half size.

## EXPLANATION OF PLATE V.

*Genyornis newtoni*:—Tarso-metatarsus and Toes (right); figs. 1-6.

- Fig. 1. Anterior surface of tarso-metatarsus with upper surfaces of phalanges.  
 2. Posterior surface of tarso-metatarsus with lower surfaces of phalanges.



- Fig. 3. End contour of proximal extremity of tarso-metatarsus. The upper margin corresponds to the posterior surface.
4. End contour of distal extremity of tarso-metatarsus. The upper margin corresponds to the anterior surface.
  5. Contours of proximal ends of proximal phalanges. The upper margin corresponds to the dorsal surfaces.
  6. Outer surfaces of phalanges.

## INDEX TO LETTER REFERENCES.

- A* Elevated lip of ento-condyle.  
*B* Anterior intercondylar process.  
*C* Hypotarsus.  
*D* Bridge covering posterior ent-interosseous canal.  
*E* Anterior interosseous depression.  
*EC* Ecto-condylar surface  
*F* Nutrient arterial foramen.  
*G* Groove on posterior surface leading to inner intertrochlear interspace.  
*H* Keel like process on outer side of upper extremity.  
*IC* Ento-condylar surface.  
*J* Posterior ect-interosseous canal.  
*K* Ecto-trochlea.  
*L* Ento-trochlea.  
*M* Meso-trochlea.  
*N* Foramina above ecto-trochlear interspace.  
*II.* Proximal phalanx of inner toe.  
*III.* Proximal phalanx of middle toe.  
*IV.* Proximal phalanx of outer toe.

The other phalanges of each toe are placed in their proper relative order.

All the figures are half size.



## THE COLEOPTERA OF LAKE CALLABONNA.

By J. G. O. TEPPER, F.L.S., &amp;c.

[Read October 6, 1896.]

The following list represents the Coleoptera collected by A. Zietz, Esq., F.L.S., in the vicinity of the above lake (formerly known as Lake Mulligan) during the latter part of 1893. They were placed in the hands of the Rev. Thomas Blackburn, who kindly identified them for the South Australian Museum, and has described the numerous new species in the Transactions of the Royal Society, S.A., without enumerating those already known.

## I. CICINDELIDÆ.

1. *Megacephala* Howitti, *Cast.*  
*cylindrica*, *McLeay.*

## II. CARABIDÆ.

2. *Calosoma* Schayeri, *Erichs.*
- 2a. *Diaphorus* (*Zuphiosoma*) *fulva*, *Cast.*
3. *Gigadema* longipennis, *Germ.*  
*sulcata*, *McLeay.*
4. *Trigonothops* nigrosignata, *Chaud.*
5. *Phlæocarabus* crudelis, *Newm.*
6. *Neocarenum* Blackburni, *Sloane.*
7. *Philoscaphus* Tepperi, *Blackb.*
8. *Euryscaphus* obesus, *McLeay.*
9. *Geoscaptus* lævissimus, *Chaud.*
10. *Chlænienus* australis, *Dej.*  
*lateriviridis*, *Chaud.*  
*Poecilus*? sp.
11. *Oodes* Waterhousei, *Cast.* (*interioris*, *Cast.*).
12. *Phorticosomus* grandis, *Cast.*
13. *Anisodactylus* rotundicollis, *Cast.*
14. *Hypharpax* habitans, *Sloane.*  
*interioris*, *Sloane.*  
*vilis*, *Blackburn.*
15. *Rhytisternus* Arnheimensis, *Cast.* (?).  
*Callabonnensis*, *Blackb.*  
*cyathoderes*, *Chaud.*  
*Froggatti*, *McLeay.*  
*Stuarti*, *Sloane.*
16. *Chlænioideus* herbacea, *Chaud.*

17. *Dicrochile Goryi*, *Boisd.*  
 18. *Anchomenes marginicollis*, *McLeay.*  
 19. *Pogonus cardiotrachelus*, *Chaud.*  
     *hypharpioides*, *Sloane.*  
     *Zietzi*, *Sloane.*  
 20. *Bembidium Jacksoniense*, *Guér.*

## III. DYTISCIDÆ.

21. *Edroma benefica*, *Newm.*  
 22. *Bidessus bistrigatus*, *Clark.*  
 23. *Necterosoma penicillata*, *Clark.*  
 24. *Platynectes decempunctata*, *Fabr.*  
 25. *Rhantus pulverulentus*, *Steph.*  
 26. *Eretes australis*, *Erichs.*

## IV. HYDROPHILIDÆ.

27. *Hydrophilus albipes*, *Cast.*  
 28. *Hydrobius assimilis*, *Hope.*  
 29. *Phylhydrus Andersoni*, *Blackb.*  
 30. *Hygrotrophus nutans*, *McLeay.*  
 31. *Berosus Macumbensis*, *Blackb.*  
     *minutipennis*, *Blackb.*  
 32. *Notoberosus Zietzi*, *Blackb.*

## V. STAPHILINIDÆ.

33. *Aleochara semirubra*, *Fauvel.*  
 34. *Quedius semiviolaceus*, *Fauvel.*  
 35. *Creophilus erythrocephalus*, *Fabr.*  
 36. *Scimbalium duplopunctatus*, *Fauvel.*  
     *microcephalum*, *Fauvel.*  
 37. *Dicax deserti*, *Blackb.*  
 38. *Pæderus cruenticollis*, *Germ.*  
 39. *Pinophilus latebricosus*, *Blackb.*  
     *trapezus*, *Fauvel.*

## VI. PAUSSIDÆ.

40. *Arthropterus* (?) sp.

## VII. HISTERIDÆ.

41. *Saprinus lætus*, *Erichs.*  
     *cyaneus*, *Fabr.*  
     sp.

## VIII. COLYDIDÆ.

42. *Bothrideres variabilis*, *Blackb.*

## IX. DERMESTIDÆ.

43. *Dermestes cadaverinus*, *Fabr.*  
     *vulpinus*, *Fabr.*

## X. SCARABÆIDÆ.

44. *Aphodius Callabonnensis*, *Blackb.*  
*lividus*, *Oliv.*  
 sp. (?)
45. *Ataenius Zietzi*, *Blackb.*
46. *Onthophagus consentaneus*, *Har.*  
*Murchisoni*, *Blackb.*  
*nitidior*, *Blackb.*
47. *Bolboceras trituberculatum*, *Bainb.*
48. *Trox Augustæ*, *Blackb.*  
*Crotchi*, *Har.*  
*litigiosus*, *Har.*  
*quadridens*, *Blackb.*  
*Strzelecki*, *Blackb.*
49. *Liparochrus geminatus*, *Westw.*  
 sp.
50. *Liparetrus Adelaidæ*, *Blackb.*  
*aridus*, *Blackb.*  
*distinctus*, *Blackb.*  
*melanocephalus*, *Blackb.*
51. *Colpochila deceptor*, *Blackb.*  
*palpalis*, *Blackb.*
52. *Heteronyx addendus*, *Blackb.*  
*arcanus*, *Blackb.*  
*decorus*, *Blackb.*  
*horridus*, *Blackb.*  
*Helmsi*, *Blackb.*  
*sparsus*, *Blackb.*  
*suturalis*, *Blackb.*  
*vagans*, *Blackb.*  
 sp.
53. *Rhopæa Mulliganensis*, *Blackb.*
54. *Zietzia geologa*, *Blackb.*
55. *Callabonnica propria*, *Blackb.*
56. *Isodon pecuarius*, *Reiche.*  
 sp.
57. *Semanopterus rectangulus*, *Blackb.*

## XI. BUPRESTIDÆ.

58. *Bubastes splendens*, *Blackb.*
59. *Chrysobothris interioris*, *Blackb.*
60. *Merimna atrata*, *Cast. et Gory.* ("Fire Beetle.")

## XII. ELATERIDÆ.

61. *Dromæolus interioris*, *Blackb.*
62. *Agrypnus Mastersi*, *McLeay.*

63. *Lacon fatuus*, *Cand.* (?).  
     *guttatus*, *Cand.*  
     *variabilis*, *Cand.* (*et var.*)  
     *Zietzi*, *Blackb.*
64. *Tetralobus Fortnumi*, *Hope.*
65. *Monocrepidius commodus*, *Blackb.*  
     *inamœnus*, *Blackb.*
66. *Cardiophorus elisus*, *Cand.* (?)

## XIII. MALACODERMIDÆ.

67. *Metriorrhynchus brevistre*, *Waterh.*

## XIV. CLERIDÆ.

68. *Laius bellulus*, *Guér.*  
     *pretiosus*, *Blackb.*
69. *Opilo congruus*, *Newm.*
70. *Orthrius cylindricus*, *Gorh.*
71. *Eleale aulicodes*, *Gorh.*  
     *sp.*
72. *Necrobia rufipes*, *Degeer.*
73. *Dasytes fuscipennis*, *Hope.*

## XV. PTINIDÆ.

74. *Polyplocotes* *sp.*

## XVI. BOSTRYCHIDÆ.

75. *Xylopertha* *sp.*

## XVII. TENEBRIONIDÆ.

76. *Opatrum Cowardense*, *Blackb.*  
     *torridum*, *Champ.*
77. *Cestrinus Zietzi*, *Blackb.*
78. *Pterohelaeus alternatus*, *Pascoe.*  
     *bullatus*, *Pasc.*  
     *fraternus*, *Blackb.*
79. *Helaeus interioris*, *McLeay.*  
     *squamosus*, *Pascoe.*
80. *Hypocilibe læta*, *Blackb.*
81. *Brises trachynotoides*, *Pascoe.*
82. *Ephidonius parvicollis*, *Blackb.*
83. *Tenebrio molitor*, *L.*
84. *Chalcopterus carus*, *Blackb.*
85. *HomotrYSIS Callabonnensis*, *Blackb.*
86. *Ulomodes humeralis*, *Blackb.*

## XVIII. CISTELIDÆ.

87. *Apellatus palpalis*, *McLeay.*
88. *Scaletomerus harpaloides*, *Blackb.*

## XIX. MORDELLIDÆ.

89. *Mordella communis*, *Waterh.*

## XX. OEDEMERIDÆ.

90. *Ananca Zietzi*, *Blackb.*

## XXI. CURCULIONIDÆ.

91. *Prosaulius comosus*, *Germ.*  
 92. *Pephricus squalidus*, *Germ.*  
 93. *Hyphæria paralella*, *Blackb.*  
 94. *Sclerorrhinus* sp.  
 95. *Cubicorrhynchus taurus*, *Blackb.*  
 96. *Ophriota rapax*, *Blackb.*  
 97. *Oxyops fasciatus*, *Boisd.*  
 98. *Desiantha sericea*, *Blackb.*  
 99. *Isacantha* (?) sp.  
 100. *Catocalphe minans*, *Blackb.*

## XXII. CERAMBYCIDÆ.

101. *Phoracantha semipunctata*, *Fahr.*  
 102. *Neostenus spinipennis*, *Blackb.*  
 103. *Aposites lanaticollis*, *Blackb.*  
 104. *Anatisis (Petalodes) laminosus*, *Newm.*  
 105. ? Genus nov., sp. n. (?)

## XXIII. CHRYSOMELIDÆ.

106. *Chalcolampra acervata*, *Germ.*  
 107. *Paropsis Zietzi*, *Blackb.*  
 108. *Aulacophora hilaris*, *Boisd.*

## XXIV. COCCINELLIDÆ.

109. *Coccinella repanda*, *Thunb.*

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Various single undeterminable specimens.

24 Families, 111 genera, 160 species (12 not named).

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DESCRIPTIONS OF NEW SPECIES OF MARINE  
MOLLUSCA OF SOUTH AUSTRALIA.

By JOS. C. VERCO, M.D., Lond., &c.

[Read October 6, 1896.]

PLATES VI. — VIII.

*Voluta translucida*, *spec. nov.* Pl. vi., figs. 4 and 4a.

Shell elongately ovate, very thin, diaphanous smooth and glistening, of six whorls including the nucleus. This is inconspicuous, merging imperceptibly into the spire-whorls, apparently consisting of one turn and a half, very flatly convex at the apex, smooth. Spire-whorls sloping, slightly convex, suture simple, surface smooth, but for very obsolete incremental striæ. Body-whorl relatively large, smooth but for obsolete longitudinal striæ, which become more conspicuous toward the aperture, especially anteriorly and over the scarcely raised varix of the notch. Aperture elongate-ovate, narrowed posteriorly, dilated anteriorly, and with a very wide shallow notch. Outer lip simple acute thin convex when viewed either laterally or from below. Columella convex in the posterior half, almost straight anteriorly; no callus of the inner lip; fourplicate, the lower three plicæ well-marked narrow and equi-distant, the uppermost less raised and at a less distance.

Ornament, a narrow spiral reddish-brown line close beneath the suture; longitudinal narrow curved lines of the same color, about 16 in the body-whorl, composed of minute zigzags or of very small spirally elongated spots; two indefinite spiral color-bands encircle the whorl, one at the level of the posterior angle of the aperture, another just above the level of the highest columellar plait winding over the dorsum of the notch, composed of prolongations of the zigzags between the longitudinal lines, and thickening of the spots in the lines

Total length, 39·5 mm.; greatest width, 16 mm.; spire, 14·5. Length of aperture, 25 mm.; width, 7 mm.

*Habitat.*—One perfect dead specimen 20 fathoms off Newland Head, outside Backstairs Passage; broken fragments of two in six to ten fathoms Yatala Shoal, and six small immature dead specimens from dredge siftings 22 fathoms Backstairs Passage (*Verco*).

**Harpa punctata**, *spec. nov.* Pl. vi., figs. 3, 3a, 3b.

Shell roundly-ovate, rather thin, smooth, glistening, of four and a-half whorls. Nucleus one turn and a-half, slightly mammillate, apex inserted, first whorl rather excentric, next half-whorl marked off from the first by a depressed scar; suture simple and distinct; distinguished from spire-whorls by its smoothness, but for minute sublenticular longitudinal striæ, and by absence of ornament. Spire-whorls two, gradated, with a marked very slightly rounded angle, behind which the first turn is subconvex, becoming gradually less so, the second is subconcave, and in front of which both are slopingly subconcave; very minutely longitudinally striated under the lens, best seen behind the angle, and still more minutely spirally incised. On the second spire-whorl are also erect reflected curved scales, at gradually increasing intervals, best seen behind the angle, and continuous anteriorly with slightly prominent subvaricose longitudinal striæ. Body-whorl ventricose, slightly excavated close to the suture, forming a slightly rounded angle, then uniformly sloping-convex; surface divided into ten longitudinal areas by the remains of slightly projecting lips, which behind the angle form erect, rounded, slightly-reflected plates, the earlier ones more and more worn away; the areas finely longitudinally and spirally incisedly striate. Aperture large, nearly plano-convex; outer lip uniformly convex, simple, very slightly thickened outside, rather more so about two lines within, edge almost sharp; posteriorly ascending for two lines, slightly reflected and pointed, and forming a marked notch at the suture. Columella slightly convex behind, nearly straight in the anterior half, excavated in the lower fifth. Inner lip distinct, smooth, with callus increasing in thickness from behind forward; posteriorly it forms a short sinus with the ascending outer lip, then is applied spreading somewhat and uniformly over the body-whorl; in the lower half with a free margin least marked where it crosses the varix of the notch, then slightly inflected and incurved to the extremity of the columella. Anterior notch distinct and everted and recurved.

Ornament, nucleus, and spire-whorls of a uniform salmon tint. The latter and the body-whorl closely dotted with small deep chestnut spots, their spiral diameter twice as great as their longitudinal, arranged in longitudinal series so that the dot of each is opposite the space in the next. The body-whorl has also two broad salmon-coloured spiral bands, one from the back of the aperture to a little above the middle of the lip, the other from a little above the middle of the aperture to the lower third of the lip. Just behind the remains of previous lips in these bands are crescents of dark chestnut, and similar crescents are found here and there on the body and spire-whorls close to the suture.



Behind these bands is one narrower and less distinct, and another at and behind the angle ; one between the broad bands, and two in front of the lower one. Between all the bands are narrow indistinct whitish areas. The inner edge of the lip is white, with less distinct and narrower coloured areas corresponding with the bands outside. The throat is translucent, and reveals faintly the external dots and bands.

*Habitat.*—Two recent and two broken shells, 20 fathoms Newland Head ; one immature dead and one broken, 22 fathoms Backstairs Passage (*Verco*).

This new species cannot be confounded with any other form. The distant ribs and dotted ornament distinguish it at once.

Tryon says, in his *Man. of Conch.*, Vol. V., p. 97, "Like *Strombus*, *Harpa* appears to be a completed genus, no new forms rewarding the industry of modern investigators and explorers." The discovery of a new species is, therefore, of peculiar interest. And this is increased by the fact that the two other Australian forms, *H. ventricosa*, Lam., and *H. minor*, Lam., are inhabitants of the warmer regions of the North and North-West parts of the continent.

**Tritonidea** (*Cantharus*, Meek, 1876) **fusiformis**, *spec. nov.*

Pl. vi., figs. 1, 1a, 1b ; var., 2, 2a.

Shell ovately fusiform, solid, whorls seven, including the nucleus. Nucleus conspicuous, of two turns, smooth, convex ; suture deep, apex slightly exserted (in specimens as usually found on the beach it is inconspicuous, and nearly flat.) Spire-whorls four, convex, sutures regular distinct, impressed ; longitudinal costæ regular round, width rather greater than the intervals or the height. Thirteen in the penultimate whorl, crossed by spiral liræ, rounded, valid, not quite so wide as the interstices, nine primary in the penultimate, with two or three secondary threadlets in the wider spaces ; very numerous fine longitudinal sublenticular incised striæ. Body-whorl uniformly convex, contracted anteriorly ; 11 to 12 longitudinal costæ, most marked posteriorly, becoming less valid in front of the periphery. About 30 spiral liræ, fairly regular, with an occasional interstitial threadlet crossed by minute incremental incised striæ. Aperture elongately oval, somewhat narrowed anteriorly. Outer lip uniformly convex, margin sharp, minutely crenulated throughout, outside varicosely thickened from suture to notch by a rounded pad with a corresponding furrow inside of varying depth in different specimens ; internally otherwise smooth, save for an obsolete blunt tooth-like process close to the suture ; in some individuals there are seven or eight narrow plicate denticles nearly equidistant. Columella concavely arcuate above, straight

and slightly sinistrally oblique below, the junction marked by a scarcely bifid spiral callus plica. Inner lip with a thin smooth shining callus applied posteriorly, margined in the lower third, in some individuals with a margin just free throughout; a spiral tooth-like blunt process close to the suture forms with a corresponding one on the outer lip a kind of sinus. Canal short, rather wide, outer lip just everted; scarcely recurved, notched anteriorly. Ornament faint rusty-brown with narrow white band above the sutures, and encircling the body-whorl just above the middle; bounded above by a line one-third of its width, of darker colour, generally most marked on the costæ so as to appear somewhat articulated; a similar but less marked line bounds it below; irregular rust-coloured longitudinal flames extend from the white bands to the anterior extremity of the body-whorl; interior of aperture of a rusty-purplish colour with an indistinct broad whitish spiral band. In life a thin minutely hairy periostracum covers all the shell except the nucleus, and almost hides the ornament.

Total length, 17 mm.; greatest width, 8.5 mm.; length of spire, 8 mm.; body-whorl, 9 mm.

*Habitat.*—Dredged alive 15 fathoms Investigators Straits, one; off Middleton, 15 fathoms, one recent; 20 fathoms in and outside Backstairs Passage, one recent and one dead (*Verco*), Spencer Gulf.

Variety, *T. Adcocki*. Rather more solid, with about 11 spiral liræ in the body-whorl, which become progressively stouter and more distant anteriorly with one or two interstitial threadlets, and where the liræ are stoutest with secondary threadlets on their sides. The longitudinal costæ are rather narrower and higher and quite pronounced posteriorly, but below the periphery they are almost broken up into very large tubercles on the spiral liræ. The aperture is generally more contracted, there are seven well-marked teeth inside the outer lip, besides the posterior process. On the inner lip the columellar projection anteriorly is validly bifid, and at the margin of the lip there are four rather distant teeth in a series diminishing backwards, besides the well-marked posterior tubercle. The white band with its dark margins is less conspicuous, the longitudinal rusty waved flames are rather more marked, though somewhat broken up into dots or blotches chiefly on the nodular intersections of costæ and liræ. Intermediate forms connect this variety with the typical species.

*Habitat.*—Middleton Beach (*D. J. Adcock*).

*Diagnosis.*—Hitherto, in South Australia, it has been called *Cantharus rubiginosus*, Rve., but is quite distinct from that. Its nearest ally appears to be *Buccinum D'Orbigny*, Payrandeau,

Cat. Moll. de Corse, p. 159, pl. 8, f. 4 to 6; also Conch. Icon. Rve. Bucc., f. 44; Man. of Conch. Tryon, Cantharus, vol. III., p. 158, pl. 73, f. 266. Variety *C. Adcocki* approaches this; but from the description, which is meagre, and from the plate, one would judge that the costæ of the foreign shell are less numerous and more valid, the canal is less oblique, while the ornament, beautifully variegated with black and yellow, is different.

**Triton (Argobuccinum) mimeticus**, Tate (*Sipho*).

Pl. vi., figs. 6, 6a, 6b.

This shell was referred to by me in a previous paper as *Triton mimeticus*, Tate, and I place it now in the subgenus *Argobuccinum*. I obtained a living specimen in 20 fathoms off Newland Head, and a recent dead one in 17 fathoms off Porpoise Head, both places just outside Backstairs Passage, as well as a dead specimen, and fragments of two more. The first two have each three varices, and of these the first lies close behind the third. The canal figured in Proc. Roy. Soc., S.A., 1895, vol. XIX., pl. ii., f. 4, 4a, was fractured. In a living shell 25 mm. in length, with an aperture of 8.5 mm. long, the canal is 8.75 mm. in length. Nearly closed at first, it gradually becomes about twice as widely open at the anterior as at the posterior end; the whole canal is slightly uniformly recurved. There is no periostracum. Above the row of tubercles the shell is fulvus brown, with deeper-tinted blotches; the tubercles are white. Below these it is fulvous-brown, except for a spiral white band about two lines in width, bounded above and below by a fine line articulated white and brown, the joints being rather long, the lower one on the obsolete carina. A third articulated line is at an equal distance in front. The anterior extremity of the canal becomes gradually deep brown. On the outside of the outer lip are four equidistant, rather large squarish brown spots. Operculum large, filling the aperture, ovate, nucleus apical. The dentition (Pl. vi., fig. 6b) shows a central rachidian tooth five-cusped, an inner uncinus or lateral six or seven pointed, and two simple uncini, the inner sickle-shaped, the outer scimitar-shaped. The disposition of the varices is that of *Ranella* and *Argobuccinum*, and the peculiar flat shape of the shell brings it into alliance with these. The simplicity of the uncini, their freedom from saw-points, suggests relation with *Ranella* rather than *Triton*. But the length of the anterior canal compared with that of the aperture, which it fully equals, is found in *Triton*, but is an unknown character in *Ranella*. The only Ranelliform shell in which the canal approaches the aperture in length is *Argobuccinum gigantea*, Lam., and no *Ranella* is known to me in which, as in this, the canal equals one-third of the total length of the shell. The apical nucleus of the

operculum, and the absence of a posterior canal, locate it in *Argobuccinum* as a subgenus of *Triton*, with affinities to *Ranella*.

***Drillia telescopialis*, spec. nov.** Pl. vii., figs. 1, 1a, 1b.

Shell minute, thin. Whorls six, including the nucleus. Nucleus one turn and a half, smooth, with deep impressed suture, apex exerted. Spire-whorls sloping, nearly straight, gradated, angled at junction of posterior and middle fourth; behind this the whorl is bevelled to the suture, which is distinct and impressed. Whorls sculptured with spiral liræ, four to six in front of the angle, two behind it, flatly rounded, equidistant, wider than the interspaces. Longitudinal liræ numerous, equidistant, about 20 in the penultimate whorl, narrower than the interspaces; in some specimens crossing the spiral liræ and wider than them, generally most marked and forming conspicuous costæ in the second and third spire-whorls; in others narrower, crossed by the spiral liræ, giving a cancellated appearance. Body-whorl nearly cylindrical, angled a little below the suture and again at the periphery, below which it is excavately contracted to the base; provided with spiral liræ, two behind the upper angle, about seven between the angles, and nine or ten below, the most valid forming a minute carina at the lower angle, crossing or crossed by 18 to 20 wider or narrower longitudinal liræ continued to the base, though less conspicuous here. Aperture elongately rhomboidal; wider anteriorly. Outer lip simple, thin, crenulated, with a well-marked semi-circular sinus from the posterior angulation to the suture, lip slanting obliquely from the carina to the anterior notch. Columella straight, inner lip inconspicuous except behind, where there is a columellar callus, from which springs the acute upper boundary of the sinus. Notch simple, anterior extremity truncated obliquely to the left. Ornament uniform, rusty-brown or white.

Length, 45 mm.; breadth, 1.25 mm.

*Habitat*.—Backstairs Passage, 14 dead.

Types in my cabinet.

*Diagnosis*.—I know no *Drillia* with an approximate form.

***Drillia pentagonalis*, spec. nov.** Pl. vii., figs. 2, 2a.

Shell minute, telescope-shaped, rather thick. Whorls four and a half, without the nucleus. Nucleus absent. Spire gradated, whorls straight-sided in the anterior three-fourths, and bevelled at an angle of 45° to the posterior suture, which is distinct and simple. Five longitudinal ribs, continuous, narrow, erect, prominent; interspaces nearly flat, giving a pentagonal section. Sublenticular inconspicuous longitudinal and spiral striæ, which cross the ribs. Body-whorl with five longitudinal ribs, squarely rhomboidal, angulated near the suture, and carinated at the

periphery, the ribs having projecting points here, and the carina being curved between them; whorl excavately contracted below. Scarcely visible sublenticular longitudinal striæ in upper part; rather less obsolete spiral striæ; these are more valid below the carina, where seven can be counted on the ventral aspect. Aperture narrow, elongately oblong. Outer lip varicosely thickened by a rib, margin thin, simple, and sharp, straight for four-sevenths of its length, between the angle and the carina, curved towards the notch in the lower two-sevenths, and containing a well marked sinus in the upper seventh, rather more than a semi-circle, not quite reaching to the suture. Columella straight, slightly concave below, inner lip inconspicuous. Ornament unicoloured dull stony-white.

Length, 3·5 mm.; breadth, 1·25 mm.

*Habitat*.—Dredge siftings (probably Backstairs Passage), deep water, two dead (*Verco*).

*Diagnosis*.—From *D. telescopialis*, nobis, by the pentagonal shape, the five ribs, and the absence of cancellation.

**Mitra Vincentiana**, *spec. nov.* Pl. viii., fig. 3.

Shell, elongately-fusiform, moderately solid. Nucleus detached in all specimens, and earlier whorls corroded. Spire, eight whorls, slightly convex; suture well marked, linear, minutely channelled. First three or four whorls longitudinally costate, costæ gradually becoming obsolete, but may sometimes be traced to the next whorl, and may be represented by indistinct and irregular plicæ over the rest of the spire; spiral threadlets rounded and indistinct, about 12 in the penultimate whorl; very minute sublenticular incremental longitudinal striæ are also visible.

Body-whorl uniformly very slightly convex; faintly marked close-set longitudinal striæ, and numerous low, unequal rounded spiral threadlets, least marked over its centre. A very distinct spiral furrow starts just above the highest columellar plica, and winds round the dorsum of the base with two or three shallower ones behind it, and about four or five wrinkles in front of it. Aperture oblique, narrow, elongate-oval, contracted above, opening widely into the notch below. Outer lip uniformly curved, except for slight central straightening, simple, thin, sharp, smooth internally. Columella straight, very slightly excavated anteriorly; plicæ four, well marked, intervals regularly narrowing anteriorly; sometimes the elevated anterior margin of the columella exactly simulates a small fifth plica. Inner lip scarcely visible, except below the lowest plica, whence the callus stretches to the notch; only in living specimens can the extent of the lip be recognised, and then only by the polished surface of the aper-

ture. Notch well marked, margins slightly everted. Ornament, uniform dull salmon colour.

Length, 19 mm.; breadth, 6.75 mm.; aperture length, 8.5 mm.; width, 2.75.

*Diagnosis.*—It differs from *M. Rosetta*, Ang., in the costation of the earlier whorls, and in the absence of the punctated spiral incisions. It differs from *M. Australis*, Swns., in its more attenuated form, in the less abrupt contraction of the body-whorl below the periphery, the more uniform curve with a larger radius of the outer lip, and the consequent absence of the contraction of the lower part of the aperture; also in the relative length of the aperture and spire; in *M. Australis*, in the smaller shells, these are as 100 to 103.6, in the larger as 100 to 114.3, in *M. Vincentiana* as 100 to 131.4.

*Habitat.*—Investigators Straits from 13 to 15 fathoms, two recent; off Bank's Islands, Spencer Gulf, in 10 fathoms, one recent; Backstairs Passage, in 17 fathoms, one dead (*Verco*).

Types in my cabinet.

**Sureula Perksi**, *spec. nov.* Pl. vii., figs. 3, 3a, 3b, 3c.

Shell fusiformly ovate, solid, imperforate. Whorls ten, including nucleus. Nucleus two whorls, smooth, inflated, horn-colored. Spire, suture distinct, impressed, finely crenulated; whorls subconvex, with a groove at the junction of the upper and middle third, having a double row of granules just above it, and another row immediately below it. Numerous longitudinal wavy plicæ, about as wide as the intervals, and not quite so high, rounded, about 25 in the penultimate whorl. Abundant fine spiral striæ, 15 in the penultimate, crossing the plicæ, and making them granose. Body-whorl subinflated, contracted at the base, sculpture in the upper part as in the spire; longitudinal granose plicæ, about 40, following the sinuosities of the outer lip, lost at the extreme base, and becoming less valid and more crowded towards the aperture, cut by transverse striæ, which are irregularly alternately larger and smaller. Aperture oblique, elongate-ovate, constricted close to the suture. Outer lip thin, sharp, with a well-marked sinus, about three millimetres deep, with its centre 2.5 mm. from the suture, with the sides convex, and a concave bottom at the row of tiny nodules in front of the groove; a shallow anterior wide sinus just behind the notch of the canal. Canal very short, wide, open, notch rather large, oblique, its left border produced beyond the right; margins slightly everted. Columella straight, slight sinistral deviation anteriorly, smooth from removal of sculpture, callus very thin, applied, inconspicuous, barely free at the anterior extremity. Ornament greyish-white, with small deep rust-colored spots on the rows of granules

just below the suture (sometimes continued from these as wavy longitudinal lines), and on the spiral row just below the groove of the sinus, and finer spiral lines of spots on alternate transverse rows of costal granules, over the body-whorl to the base. Aperture white. Operculum moderately large, elongate-ovate acute (Pl. vii., fig. 3c).

Length, 20 mm.; breadth, 8.25 mm.; aperture length, 10.25; width, 3.25.

Type in my cabinet.

*Habitat.*—Five examples alive in 15 fathoms off Thistle Island, in weed, brought up in two successive casts off the dredge (*Verco*).

*Diagnosis.*—*S. Quoyi*, Rve., is a larger shell, with the sub-sutural band not at all or scarcely nodulated, and with large nodules in the groove of the sinus, and no longitudinal costæ. *S. Oweni*, Gray, has in the spire-whorls the sinus nodules immediately above the suture, instead of at or slightly above the centre of the whorls. The nodules are only half as numerous, 20 in the body-whorl instead of 40; its longitudinal plicæ are very fine, and are just twice the number of the nodules.

It is named after Dr. R. H. Perks, the Secretary of our Section, a naturalist well known in South Australia.

The character of the operculum with its apical nucleus suggests a doubt whether this shell should be placed in *Surcula*. According to Fischer, in his *Manuel de Conchyliologie*, p. 591, this genus has an operculum with its nucleus medio-lateral and internal like that of *Clavatula*, of which he gives a figure. I find, however, that the operculum of *Surcula Quoyi* has its nucleus apical. The two shells are conchologically closely allied. I place my species, therefore, with it, in *Surcula* for the present, and leave the character of the operculum and its importance as a generic diagnostic for further consideration.

***Turricula apicincta***, *spec. nov.* Pl. viii., figs. 4, 4a, 4b.

Shell turretted, fusiform, rather thin, shining. Spire, elate of eight whorls, including nucleus. Nucleus distinct dextral, two turns, excentric, sometimes slightly mammillate, smooth, suture well marked, pinkish brown, retaining its color in the dead white shell, and prettily tinting its apex. Spire-whorls sloping, scarcely convex, the convexity varying in different individuals. Longitudinally finely costate throughout; costæ most valid in the earlier whorls, about 35 in the penultimate, slightly nodulated at the posterior suture, wider than the interstices in the earlier whorls, narrower in the later, rounded, rather broader than high; sutures distinct impressed. Transverse liræ numerous, three in the penultimate whorl, flattened, wider than the interstices,

which are scarcely more than incisions, crossing the costæ, but less valid there than in the intervening furrows. In the first three whorls, just below the suture (the distance increasing gradually in successive whorls) a well-marked transverse furrow cuts off a row of subsutural nodules from the costæ; in the fourth whorl this is less marked, and the other spiral furrows become nearly equal to it, gradually diminishing in depth towards the centre of the whorl. Last whorl subconvex, convexity varying slightly in different specimens, contracted just below the periphery. Longitudinal plicæ numerous, close-set, irregular in size and distance, degenerating into marked incremental striæ towards the aperture. Spiral incisions well marked below the suture to the middle of the whorl, obsolete in front of this, though still visible under the lens; five or six valid spiral furrows over the contracted part behind the notch. Aperture obliquely elongately oval. Outer lip nearly straight in the upper two-thirds, then bent to the left at an angle of  $135^{\circ}$ ; simple, acute. Columella straight for one-half its extent, then slightly bent to the left; plicæ four, sometimes the last forms the margin of the canal, sometimes is distinctly above it, equidistant, well marked, sometimes ceasing at the margin of the callus of the inner lip, which is sharply defined and at the lower part free, so as to form a minute rimate perforation with the varix of the notch. Canal wide, short, scarcely reflected, distinctly notched. Ornament, color greyish-white, a broad indistinct pinkish-brown subsutural band, maculated at intervals with deeper brown patches; in some examples only these are visible. On the body-whorl three indistinct fine bands either continuous or composed of brown dots, the highest of which appears on the spire-whorls, the lowest may be continuous over the anterior part of the shell from a little above the columellar plicæ. When dead, the shell is nearly pure white with a pinkish tip, and faint brownish maculations.

Length, 11.20 mm.; breadth, 3.5, or 10 mm. and 3.75; length of aperture, 4.5 mm.; width, 1 mm.

*Diagnosis.*—It resembles *M. Tasmanica*, Ten.-Woods. (lent to me by Mr. May, of Hobart), in the ribbing and transverse girdling, but the shape is different. The latter is ovate and attenuate at both ends, with these dimensions: 11 mm. long., 5 mm. broad; length of aperture, 6 mm. fully. It is brown, with two or three yellowish-white bands—mine is greyish-white, with brown bands, but this distinction may simply be a question of width of bands, in which circumstance mine vary widely.

*Habitat.*—St. Vincent Gulf, 17 fathoms, six dead; off Newland Head, 20 fathoms, nine dead (*Verco*).

Types in my cabinet.



**Imbricaria porphyria**, *spec. nov.* Pl. viii., figs. 5, 5a.

Shell ovate-conic, solid, of five whorls, exclusive of nucleus. Nucleus two whorls, smooth, flattened, papillary. Spire short, slightly acute, about one-fourth the total length of the shell, whorls subconvex, roundly angled at lower part, longitudinal plicæ indistinct, low, inequidistant, closer on the posterior whorls, with finer distinct regular longitudinal striæ under the lens. Spiral striæ, about seven on the penultimate whorl, sublenticular, flat crowded, crossing the plicæ. Sutures distinct, very slightly margined, and minutely crenulated by the longitudinal striæ. Body-whorl swollen just below the suture to form a rounded shoulder, then with a regular sloping curve to the anterior extremity. Fine sublenticular longitudinal growth-lines, close, most marked at the suture, and behind the shoulder, less marked near the aperture; spiral striæ close-set, low, most marked behind the shoulder, and just above the notch, very faint over the rest of the whorl. Aperture narrow, widest in the middle, outer lip nearly straight, simple, acute, smooth. Inner lip straight, very thin polished callus. Three very distinct, equal, nearly transverse, equidistant plaits occupying the middle third of the aperture with an obsolete one immediately below. Ornament, uniform mauve tint inside and out, nucleus dark mauve; dead shells are white.

Length, 10 mm.; breadth, 5.75 mm.; spire, 2.25 mm.; length of aperture, 7.25; width, 1.25.

*Habitat.*—In and outside Backstairs Passage, Investigators Straits, dredged alive at 15 to 20 fathoms, five; and 36 recent and dead (*Verco*). West Coast of Yorke Peninsula (*Tate*).

Types in my cabinet.

P. Fischer in his *Manuel de Conchyliologie*, p. 614, says *Imbricaria* of Schumacher has no operculum. The shell I describe has one, but I leave the discussion of its generic location for a future communication.

**Phos tasmanica**, *Ten.-Woods (Josepha)*. Pl. vi., figs. 5, 5a;  
Pl. viii., figs. 6, 6a.

Shell ovately fusiform, solid, opaque. Whorls including the nucleus 9; nucleus of two whorls, smooth, inflated. Spire-whorls convex, angled at their centre, behind this slightly excavated by a rather wide, conspicuous groove, behind this a prominent rounded subsutural band. Longitudinal plicæ numerous, regular, 16 in the penultimate whorl, slightly coronated at the angle, and forming slightly elongated nodules on the subsutural band. Distinct engraved spiral lines, crossing the plicæ, three or four in front of the angle, two or three in the groove, producing, if well marked, a row or two of small round granules there. Body-

whorl with the subsutural nodulated band, anterior to this the excavated groove, followed by its angle of junction with a uniform, slightly convex surface. The longitudinal plicæ may extend almost to the base, or may become obsolete at the periphery; and generally become less marked towards the aperture in older shells. Spiral engraved lines 13 to 15, equidistant, most marked at the base, so as to form there about five obliquely rounded spiral liræ. Aperture obliquely elongate-ovate, contracted behind between the subsutural band and a small columellar callus, minutely canaliculate. Outer lip simple, thin, slightly sinuous, internally seven narrow spiral plicate teeth, equidistant, extending to within a line of the margin. Columella nearly straight, concave at the base, where the callus is thick and closes the umbilicus; a rather broad spiral plica lies over the situation of the continuation backwards of the varix of the notch, it may be simple or bifid or three or four divided. Notch well marked, with minutely everted margins, varix of notch valid, and bounded above by a definite slightly elevated edge continuous with the sharp right margin of the notch. Ornament, rusty-brown or deep mahogany, with bluish-white patches composed of several oblong spots disposed between the engraved lines, most numerous just above and below the angulation and towards the base. In these areas the brown and whitish spots may be almost regularly articulated, or so disposed as to form longitudinal brown flames. Living shells are often brightly glistening, dead shells uniform dull rusty brown.

Length, 25 mm.; breadth, 10 mm.; spire, 14 mm.; aperture, 10 mm. long, 4.5 broad.

*Habitat*.—Along the whole coast of South Australia, at low water. Eyre's Sandpatch, West Australia, large specimens.

*Remarks*.—This shell has been known in South Australia as *Cominella suturalis*, A. Adams see list of Aquatic Mollusca of South Australia, D. J. Adcock, 1893. But that shell is a *Nassaria*, and as figured in Tryon's *Man. of Conch.*, pl. 84, fig. 542, and as examined in a specimen sent to me identified by G. B. Sowerby, is a shell quite unlike the South Australian form. The dentition of *Nassaria*, as given in the *Man.* Vol. 3, pl. 27, fig. 34, shows a six-cusped rachidian tooth, while our shell has only three cusps. I had identified it as *Josepha Tasmanica*, Ten. Woods, *Pros. Roy. Soc., Tasmania*, 1878, p. 32, upon which he founded his subgenus *Josepha*; but it had never been figured, and on enquiry it was learned that the type specimens in the Hobart Museum had been mislaid, and could not be referred to. However, Miss Lodder, of Ulverstone, Tasmania, has lately forwarded to me two shells, identical with this *Phos Tasmanica*. They were found without a label among some shells presented by

Mr. Petterd to the Launceston Museum, and a label *Josephia Tasmanica*, in his handwriting, was found in the same box without any shells attached. Mr. Petterd, to whom she referred them, says he believes these shells are the co-types of Wood's species, which was described from shells in Mr. Petterd's possession. There is, therefore, no doubt about the identity. As to its generic location: Woods created the subgenus *Josephia* for it under *Cominella*, because of its columellar plait, but Tryon says, "If it is really distinct from *Cominella*, why is it not a *Phos*?" Man. of Conch., Vol. 3, p. 207. I know of no reason why it should not be regarded as a *Phos*. Its dentition, given on pl. viii., fig. 6, is identical with that of the genus *Phos* given in Tryon's Man. Vol. 3, pl. 27, fig. 35. Its shape approximates that of *Phos virgatus*, Hinds, op. cit., pl. 83, fig. 502, and it has a columellar plication. This varies in validity in different examples, but is always present, and is not merely a projection of the varix of the notch through a thin layer of columella callus. For this callus at its margin may be quite devoid of a plication, which is yet distinct enough a little further within the aperture, where it may show two, three, or four ridges which have been subsequently laid down. I have, therefore, placed it in the genus *Phos*, and discarded the subgenus *Josephia*.

***Myodora corrugata*, spec. nov.** Pl. viii., figs. 1, 1a, 1b.

Shell transversely ovate, thin, subequilateral, inequivalve Umbos apposed, acute, retroflexed. Anterior dorsal margin uniformly slightly convex. Posterior dorsal margin uniformly slightly concave; the two forming an angle of about  $130^{\circ}$ . Ventral margin slightly convex, anteriorly rising rapidly to form a well-rounded curve with the front dorsal margin; posteriorly forming a marked angle, slightly more than a right angle, with the truncated posterior extremity; in large specimens the ventral margin is slightly concave in front of this angle. Posterior extremity almost vertically straightly truncated, the end sloping slightly downwards and forwards, making a right angle with the post-dorsal margin. Right valve convex, well-marked ridge from umbo to postero-inferior angle; sculptured with very distinct, regular, concentric ribs, about one-half the width of the interspaces, and as high as wide, smooth and rounded, continuous from one dorsal margin to the other. Left valve a little smaller than the right, almost flat, very slightly rounded transversely, an indistinct ridge from umbo to postero-inferior angle, behind which the surface is quite flat; sculpture like that of the right valve, but not quite so deep, especially behind the umbonal ridge. There is a long narrow post-umbonal area on the dorsal hinge-line, smooth, slightly excavated, the right valve composing rather

the larger part. Ventral margin very thin and simple. Internally, valves shining, pearly, indistinctly marked by the corrugations of the outside, furrows within corresponding with ridges without. A small triangular cartilage-pit within each apex; there is a small umbonal ossicle. The right valve has a long linear furrow, with a scarcely projecting long lamina at its inner margin, for the reception of a long lamina on the left valve along the whole of the post-dorsal margin. The edge of the anterior-dorsal margin of the right valve scarcely projects, so as to enclose the left valve, and allow it to rest on the ledge within.

Length, antero-posterior, 14.25 mm.; umbo-ventral, 9 mm.; sectional diameter of apposed valves, 3.5 mm.

*Habitat*.—Dredged alive, 15 to 20 fathoms, Yankalilla Bay, Backstairs Passage, and Spencer Gulf five specimens, and 23 valves (*Verco*).

***Corbula compressa*, spec. nov.** Pl. viii., figs. 2, 2a, 2b.

Shell triangulary oval, solid, compressed, inequivalve, inequilateral. Umbols in contact, acute, curved slightly forwards. Posterior dorsal margin sloping, straight for two-thirds of its length, then descending at an obtuse angle. Anterior dorsal margin about three-fourths as long as the posterior, with which it makes rather more than a right angle, scarcely excavated in front of the umbos, and forming a well rounded anterior extremity with the ventral margin. The front half of this is straight, then slightly convexly ascending, to join the posterior dorsal margin at its junction with which it is slightly excavated, so as to form a minute beak. The right valve is larger than the left. Along the anterior dorsal margin, the rounded front end, and the anterior two-thirds of the post-dorsal margin, the right valve scarcely projects beyond the left. At the posterior extremity it is deeply folded over it at a very slightly rounded angle, the depth of the fold diminishing anteriorly. From the umbo on each valve a ridge curves obliquely forwards, but is soon lost in the rounded surface of the valves; another extends obliquely backwards to the posterior inferior angle, sharply defined. The post-umbonal area is, in the left valve, somewhat excavated throughout; in the right convex, except for a slightly concave groove close to the ridge, diminishing in width from the umbo backwards. Sculpture, concentric incremental striae, more distinct and at wider intervals with age, fewer and more valid in the left valve; in the left posterior umbonal area forming distant sharp ridges, in the right being very numerous and fine. In some specimens are radial interstitial raised microscopic striae on both valves, more marked on the left. Ornament china-white, mottled with small translucent brown irregular zig-zag spots, arranged somewhat radially.

Length, 10 mm.; breadth, 6·25 mm.; thickness, 4 mm.

*Habitat*.—Yankalilla Bay, in sludge, at 20 fathoms, many alive; Backstairs Passage, Port Lincoln, Eastern Cove, Kangaroo Island, at varying depths, several (*Verco*).

Types in my cabinet.

*Diagnosis*.—Its nearest ally in our waters is *C. scaphoides*, Hinds, but the latter is a more obese shell, the transverse section is more uniformly convex, the anterior dorsal margin is comparatively longer, the angle between the anterior and posterior margin is more obtuse, the left valve is not so included in the right posteriorly, the surface behind the umbonal ridge is not so wide, or so excavated, and so the ridge is not so valid. A nearer ally is *C. luteola*, Carpenter, from San Diego Bay, which has the same compressed form, but in this species the anterior part of the shell is longer than the posterior, the junction between the anterior dorsal margin and the ventral is a larger curve, and the right valve does not include the left.

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NOTE UPON MUREX UMBILICATUS, *Ten.-Woods*. Pl. vii.,  
figs. 4, 4a, 4b, 4c.

Adams's name *scalaris* has priority of Wood's *umbilicatus*, but the former is pre-occupied by Brocchi for a fossil *Murex*, and is thus excluded. So Tryon proposed the name of *M. Angasi* as a substitute for *scalaris* (*Man. of Conch.* Vol. II., p. 109). He did not, however, know its identity with *M. umbilicatus*. This latter name, therefore, has priority. The identity is vouched for by Brazier. He sent specimens of the shell to H. Adams, who said it was identical with that named *M. scalaris* by his brother, A. Adams (*Proc. Linn. Soc. New South Wales*, Vol. VIII., Part I., p. 116). Sowerby, in *Thes. Conch. Mon. Murex*, p. 54, gives it in his alphabetical list as *scalaris*, Ad., Gen. *Fusus*?, without description or plate, and does not notice it in his *Mon. Fusus*. Tryon gives no plate of either *scalaris* or *umbilicatus*; I have therefore had a figure of *M. umbilicatus*, *Ten.-Woods*, from St. Vincent Gulf, with its operculum executed.

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#### EXPLANATION OF PLATES.

##### PLATE VI.

- |            |   |
|------------|---|
| Fig.       |   |
| 1, 1a.     | <i>Tritonidea fusiformis</i> , <i>Verco</i> .                   |
| 1b.        | Details of sculpture.   |
| 2, 2a.     | Var. <i>Adcocki</i> , <i>Verco</i> .                            |
| 3, 3a, 3b. | <i>Harpa punctata</i> , <i>Verco</i> .                          |
| 4, 4a.     | <i>Voluta translucida</i> , <i>Verco</i> .                      |
| 5, 5a.     | <i>Phos tasmanica</i> , <i>Ten.-Woods</i> .                     |
| 6.         | Triton ( <i>Argobuccinum</i> ) <i>mimeticus</i> , <i>Tate</i> . |
| 6a.        | Operculum of Triton ( <i>Argobuccinum</i> ) <i>mimeticus</i> .  |
| 6b.        | Dentition of Triton ( <i>Argobuccinum</i> ) <i>mimeticus</i> .  |

## PLATE VII.

- 1, 1a, 1b. *Drillia telescopialis*, *Verco*.  
 2, 2a. *Drillia pentagonalis*, *Verco*.  
 3, 3a. *Surecula Perksi*, *Verco*.  
 3b. *Surecula Perksi*, details of sculpture.  
 3c. *Surecula Perksi*, operculum.  
 4, 4a. *Murex umbilicatus*, *Ten.-Woods*.  
 4b. *Murex umbilicatus*, details of sculpture.  
 4c. *Murex umbilicatus*, operculum.

## PLATE VIII.

- 1, 1a, 1b. *Myodora corrugata*, *Verco*.  
 2, 2a, 2b. *Corbula compressa*, *Verco*.  
 3. *Mitra Vincentiana*, *Verco*.  
 4, 4a. *Turricula apicitincta*, *Verco*.  
 4b. *Turricula apicitincta*, details of sculpture.  
 5. *Imbricaria porphyria*, *Verco*; 5a. Operculum, anterior extremity probably broken off.  
 6. Dentition of *Phos tasmanica*, *Ten.-Woods*.  
 6a. Operculum of *Phos tasmanica*, *Ten.-Woods*.

FURTHER NOTES ON AUSTRALIAN COLEOPTERA,  
WITH DESCRIPTIONS OF NEW GENERA AND  
SPECIES.

By the Rev. T. BLACKBURN, B.A.

[Read October 6, 1896.]

XX.

PECTINICORNES.

AULACOCYCLUS.

*A. errans*, sp. nov. Minus latus; minus convexus; nitidus; rufo-brunneus; vertice cornuto, cornu adunco supra sulcato in apice emarginato; prothorace sulco marginali excepto sublævi (ut *A. edentuli*, Macl.), utrinque pone medium fovea curvata impresso; elytris minus fortiter striatis, striis æqualiter valde distincte punctulatis, puncturis in striarum interiorum parte antica quam in striis exterioribus haud minus perspicuis, interstitiis nullo modo convexis. Long., 11 l.; lat., 4 l.

The species of *Aulacocyclus* are extremely closely allied *inter se*, and most of the characters that have been relied upon in the brief published descriptions seem to be in reality of little value. The form of the frontal horn is certainly liable to some variation and the number of external teeth on the front tibiæ sometimes differs in the two tibiæ of the same specimen. Nor is the form and sculpture of the lateral fovea of the prothorax constant; I have examples in which the two fovea of an individual specimen are by no means identical. The only constant characters I can find (apart from the size which does not seem to vary much) are in the striation and puncturation of the upper surface. The present species is very easily recognised by its prothorax almost without puncturation (as in *A. edentulus*, Macl., the commonest species of the genus in my experience) in combination with elytra comparatively feebly striate but having their striæ extremely evenly punctulate (so that the punctures are scarcely less defined in the front part of the subsutural striæ than in the lateral striæ).

Australia; I do not know the exact habitat but believe it to be tropical.

*A. collaris*, sp. nov. Minus latus; modice convexus; nitidus; niger; vertice cornuto, cornu adunco supra sulcato in apice emarginato; prothorace subtiliter distincte sat crebre punc-

tulato, utrinque pone medium fovea curvata (hac haud vel minus distincte punctulato) impresso; elytris fortiter striatis, striis interioribus vix distincte (ut *A. edentuli*, Macl.) exterioribus sat fortiter (quam *A. edentuli* magis fortiter) punctulatis, interstitiis sat fortiter convexis. Long., 10—11 l.; lat.,  $3\frac{3}{5}$ —4 l,

Easily distinguishable by its prothoracic puncturation much more distinct than in any other (at any rate than in any other known to me) of its congeners, in all of which the punctures are very sparse and discernible only with a strong lens (e.g., a Codrington), while in the present species they are notably less sparse and quite distinct under a very ordinary lens. Compared with *A. edentulus* moreover this insect is smaller, narrower, more nitid and blacker, with the punctures of the external elytral striæ very much stronger. The elytral interstices moreover are evidently more convex than in *A. edentulus*, but I do not lay much emphasis on this character as the interstices of the elytra seem to vary in convexity within the limits of a species,—probably sexually.

The genus *Aulacocylus* is one presenting very great difficulty on account of the externally close alliance *inter se*, and the brevity of the descriptions, of its species. Seven names have I believe been given to Australian species (if *Rosenbergi*, Kaup, be Australian which however seems doubtful). Two of these (according to Gemminger and Harold) are synonyms of *edentulus*, Macl., and this is probably a correct reference. *Kaupi*, Macl., I strongly suspect of being another synonym of the same species. *Rosenbergi*, Kaup, and *Percheroni*, Kaup, seem incapable of identification without examining the types. They are said to be remarkable for the shortness of their frontal horn and the feebleness of their elytral puncturation. Gemm. and H. regard them as referring to only one species. *Teres*, Perch., seems to be a good species (unknown to me) fully twice as large as the species I have described above. I have examined the type of *edentulus*, Macl., and I think it is the species Burmeister applies the name to, though in that case his description cannot be called a good one, as it emphasises characters that do not seem to be constant.

## LAMELLICORNES.

### ISODON.

I have lately had occasion to attempt the determination of a number of examples some (at least) of which are referable to this genus, and have arrived at a conviction that no satisfactory generic distinction can be drawn among the Australian species that have been referred to *Isodon* and *Heteronychus*. On first



thoughts these two genera might be supposed incapable of confusion, because according to their diagnoses (*e.g.*, Lacordaire's Gen. Col., vol. III.) *Heteronychus* should have organs of stridulation on the propygidium and unequal claws on the front tarsi of the male, while in *Isodon* the organs of stridulation should be wanting and the male claws simple. But I find various combinations of these characters in species that are extremely closely allied even specifically, some with organs of stridulation having equal and others unequal claws in the male.

The species that I am referring to agree in the following characters which in combination distinguish them from all other Australian *Dynastides* known to me,—*viz.*, prothorax usually with well-marked sexual characters (in no instance known to me quite alike in the sexes), hind tibiæ with very strong apical ciliæ, basal joint of hind tarsi only feebly dilated at the apex, club of antennæ not extraordinarily developed in the male, three external teeth (only) on the front tibiæ, one of the two apical spines of the hind tibiæ inserted more or less behind the base of the tarsus (in *Nephrodopus*, &c., it is differently placed), mentum of normal form (not as in *Teinogenys*, &c.), head not armed with a horn in either sex (at most a very small conical tubercle), clypeal suture well defined and not strongly angulate hindward in the middle (as it is in *Dasygnathus*, &c.), sides of clypeus sinuate, mandibles visible, labrum not prominent, front marginal furrow of prothorax not angulate hindward in middle (as it is in *Adoryphorus*, &c.).

Fourteen Australian species presenting the above characters have been described (inclusive of *Cheiroplatys pecuarius*, Reiche, which I have no doubt is an *Isodon*). Of these three (*viz.*, *I. lævicollis*, Macl. and *glabricollis*, Macl. and *H. vulgivagus*, Oll.) appear to have been described without any knowledge of the male, and as the characters necessary to be known before their males can be identified are not given, I fear they must be treated as incapable of certain identification from description. Nevertheless, I am fairly confident that I have not seen any of them. *I. subcornutus*, Fairm, is probably identical with *pecuarius*, Reiche, so that there are only ten species of which the male has been described.

Four of these ten were described by Burmeister, but unfortunately very briefly; *Australasia*, Burm., happens to possess well-marked characters by which it can be identified, but the other three (all from W. Australia) present great difficulties. *P. curtus*, Burm., is described without the mention of a single valuable character, unless it be "the second row of punctures from the suture (on the elytra) is the least regularly seriate." I have

not seen any species presenting that peculiarity.\* *P. laticollis* has no characters assigned to it that seem really distinctive beyond that the prothorax is scarcely punctulate and the elytra has nine straight rows of punctures; characters which I cannot find in combination in any *Isodon* before me. *P. lævigatus* seems to be a peculiar species with the upper surface almost lævigate and the clypeus not at all produced; I have before me several species almost without puncturation on the upper surface, but the only one that has not some other strongly marked character (totally inconsistent with its being *lævigatus*) has the clypeus more strongly produced than in any other *Isodon* known to me. I find it difficult to believe that none of these three species are before me, and yet I am compelled to proceed on that assumption.

Reiche has described one species (*pecuarius*). It is common and widely distributed, and is possibly identical with *curtus*, Burm.

The remaining five species are Sir W. Macleay's. Two of these (*Heteronychus*† *picipes* and *irregularis*) are black species with two tubercles on the clypeal suture, which I am confident that I have not before me. One species (*Heteronychus lucidus*, from King's Sound, N.W.A.) is described as having the prothorax of the male with a frontal tubercle but without any excavation; I have not seen this species. *Isodon picipennis* (from King's Sound, N.W. Australia) is described as being black except the elytra which are red, the prothorax impunctate except on the anterior and lateral margins and the elytra coarsely punctulate; I have not seen any species likely to be this one; there is no information given regarding the claws of the male or the organs of stridulation, so I cannot place it. *Isodon puncticollis* is known to me, Mr. Masters having lent me a type.

It appears, then, that of the 14 descriptions existing of species attributable to the genus *Isodon* as I have characterised it above, one (and perhaps two) provides a synonym and that three are invalidated by their relating only to the female, so that only nine can be regarded as referring to decidedly distinct species

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\* Since writing the above I have found among some *Dynastides* from W. Australia sent by Mr. Lea for my inspection a species which seems very likely to be *I. curtus*, Burm. The claws of its male are simple, and it has no organs of stridulation. It is quite distinct from all the species of *Isodon* described or tabulated in this memoir, *inter alia multa* by its considerably smaller size.

† Through the courtesy of Mr. Masters I had the advantage some time ago of seeing an example of *H. picipes*, but did not take sufficient note of it to say much about it now beyond that it is distinct from any of the species treated in the following pages. I can say, however, that one of the claws on the front tarsi of the male is bifid.

and that I have good reason to believe only three of those nine to be before me.

With these introductory remarks I will proceed to furnish a tabulated statement of the characters of the species known to me, from which I have to exclude all the species not in my possession on account of there not being one of them of which the organs of stridulation have been definitely described.

I regret that I am not able to deal more comprehensively with these insects, but hope nevertheless that my work (such as it is) will be useful as forming a foundation on which better work may be done in the future to elucidate a genus whose species have not yet been treated with anything more systematic than isolated diagnoses.

Referring to the diagnoses which follow I may say that I have not included in them characters that seem to be generic, such as the presence of villosity on the undersurface and legs, the antennal structure, &c., as it needlessly lengthens descriptions to include in them matters that do not concern specific distinctions.

- A. Front claws of male simple.
- B. Propygium with organs of stridulation.
- C. These organs consist of two longitudinal rows of numerous fine rugæ.
  - D. Base of prothorax with a continuous marginal border ... .. *pecuarius*, Reiche.
  - DD. Base of prothorax margined only close to the sides ... .. *puncticollis*, Macl.
- CC. The organs of stridulation consist of only one or two much larger and more elevated rugæ ... .. *Meyricki*, Blackb.
- BB. Propygidium devoid of organs of stridulation.
- C. Elytra very coarsely punctulate.
  - D. Prothoracic puncturation comparatively fine ... .. *Australasiae*, Hope.
  - DD. Prothoracic puncturation extremely coarse ... .. *Terra-reginae*, Blackb.
- CC. Elytra with scarcely visible puncturation ... .. *nasutus*, Blackb.
- AA. One of the front claws of male bifid (propygidium with organs of stridulation in all the species known to me).
  - B. Two tubercles on the clypeal ridge.
    - C. Elytra distinctly punctulate ... .. *bidens*, Blackb.
    - CC. Elytra almost without puncturation ... .. *lavipennis*, Blackb.
  - BB. Clypeal ridge without tubercles ... .. *intermedius*, Blackb.

*I. Meyricki*, sp. nov. Mas. Sat late ovatus; nitidus; obscure ferrugineus, capite prothoraceque nigricantibus, antennis palpisque brunneo-testaceis; clypeo sparsim punctulato, vix ruguloso, antice rotundato-truncato, marginibus sat reflexis, lateribus sat fortiter sinuatis; fronte a clypeo per carinam simplicem divisa, sparsim leviter ruguloso-punctulata; pro-

thorace quam longiori sesquialtiori, sparsissime subtilissime punctulato, antice sat profunde excavato, margine basali continuo quam margo anticus (hoc in medio tuberculo magno armato) ut  $1\frac{3}{4}$  ad 1 latiori, angulis anticis obtusis antrorsum vix prominentibus posticis obtusis; scutello sat lævi; elytris subtilius sat leviter punctulatis (seriebus 3 inter callum humeralem et striam subsuturalem, serie 1<sup>a</sup> a scutello et a callo humerali circiter æquidistanti, area lata inter seriem 1<sup>am</sup> et striam subsuturalem lævi, seriebus 2 ultra callum humeralem, area lata inter series 3<sup>am</sup> et 4<sup>am</sup> confuse punctulata, area lata marginali fere lævi, parte apicali subfortiter punctulata); propygidio stridulationis organis instructo (his rugis paucis sat fortiter elevatis compositis); pygidio antice rugulose minus crebre punctulato, postice lævi; tibiis anticis extus fortiter tridentatis; tarsorum unguiculis simplicibus. Long., 6 l.; lat,  $3\frac{1}{2}$  l.

Fem. latet.

The sculpture of the elytra is not unlike that of *I. pecuarius*, Reiche, but is more feebly impressed, with a comparatively wide marginal space almost impunctulate. The excessively fine and sparse puncturation of the prothorax and the different structure of the organs of stridulation at once separate this insect from *pecuarius*.

W. Australia; taken by E. Meyrick, Esq.

*I. Terræ-reginæ*, sp. nov. Mas. Sat breviter subovatus; sat nitidus; nigro-piceus, antennis palpis corpore subtus et pedibus dilutionibus; clypeo sparsius subtilius punctulato, antice abrupte truncato, angulis anticis extrorsum acutis, lateribus fortiter sinuatis fere angulatis; fronte a clypeo per carinam in medio vix tuberculatam divisa, sat fortiter crebre rugulosa; prothorace quam longiori paullo plus quam sesquialtiori, fortiter minus crebre punctulato, antice vix depresso, basi haud marginata quam apex (hoc in exemplo typico haud tuberculato) ut  $1\frac{3}{4}$  ad 1 latiori, angulis anticis subacutis antrorsum leviter prominulis posticis rotundato-obtusis; scutello subtiliter sparsius punctulato; elytris grosse punctulatis (seriebus 4 inter callum humeralem et striam subsuturalem, serie 2<sup>a</sup> a scutello et a callo humerali circiter æquidistanti, area sat angusta inter seriem 1<sup>am</sup> et striam subsuturalem grosse confuse punctulata, puncturis grossis sat seriatim dispositis ad marginem lateralem continuis); stridulationis organis nullis; propygidio sat opaco sparsius squamose punctulato; pygidio nitido, puncturis sat grossis squamosis cum aliis minoribus sat crebre (prope apicem sparsim) impresso; tibiis anticis extus sat fortiter tridentatis; tarsorum unguiculis simplicibus.

Fem. latet. Long.,  $6\frac{1}{2}$  l.; lat., 4 l (vix).

Closely allied to the species which I take to be *I. Australasiæ*, Hope, differing from it chiefly by the frontal carina being scarcely tuberculate and the prothorax considerably more rounded on the sides and much more coarsely punctulate.

Queensland.

*I. nasutus*, sp. nov. Mas. Late ovatus; brevis; nitidus; piceus, capite prothoraceque obscurioribus, antennis palpisque rufis; clypeo anguste valde producto, sat crebre ruguloso, antice reflexo-truncato, marginibus leviter reflexis, lateribus fortiter subangulatim sinuatis; fronte a clypeo per carinam (hac in medio quam latera versus paullo magis elevata) fere rectam divisa, sat crebre rugulosa; prothorace quam longiori paullo plus quam sesquialtiori, vix perspicue punctulato, antice sat profunde excavato, basi haud marginata quam apex (hoc in medio tuberculo acuto armato) duplo latiori, angulis anticis sat acutis sat prominulis posticis rotundatis; scutello lævi; elytris sublævibus nitidissimis (seriebus circiter sex puncturarum obsoletissimarum et puncturis obsoletis prope apicem nonnullis vix perspicue impressis); propygidio (hoc stridulationis organo haud instructo) pygidioque leviter sparsim punctulatis; tibiis anticis extus fortiter tridentatis; tarsorum unguiculis simplicibus.

Fem. latet. Long.,  $6\frac{1}{2}$  l.; lat., 4 l.

This species, as noted above, must be much like *I. lævigatus*, Burm., but its strongly and comparatively narrowly produced clypeus is quite inconsistent with its being that insect.

W. Australia.

*I. bidens*, sp. nov. Mas. Subovatus, minus latus; sat nitidus; rufobrunneus, antennis palpisque dilutioribus; clypeo sat late minus fortiter producto, sat crebre ruguloso, antice bidentato, marginibus sat reflexis, lateribus minus fortiter sinuatis; fronte a clypeo per carinam in medio sat fortiter bituberculatam (hac inter tuberculos interrupta) divisa, antice crebre subtilius rugulosa postice sublævi; prothorace quam longiori sesquialtiori, sparsim subtiliter punctulato, antice leviter excavato, basi haud marginata quam apex (hoc in medio fortiter bituberculato) fere duplo latiori, angulis anticis minus prominulis subacutis posticis rotundato-obtusis; scutello sublævi; elytris subfortiter punctulatis (seriebus 4 inter callum humeralem et striam subsuturalem, serie 1<sup>a</sup> a scutello et a callo humerali circiter æquidistanti, seriebus 2 ultra callum humeralem, area inter series 4<sup>am</sup> et 5<sup>am</sup> confuse punctulata, area ultra seriem 6<sup>am</sup> fere lævi, parte apicali subfortiter punctulato); propygidio stridulationis organo instructo (his rugis numerosis minus elevatis com-

positis); pygidio fere lævi vel puncturis sparsissimis vix impresso; tibiis anticis extus fortiter tridentatis; tarsorum anticorum unguiculo externo bifido.

Fem. differt prothorace antice haud tuberculato, magis perspicue punctulato; unguiculis simplicibus; segmento ventrali apicali magis elongata, postice haud emarginato. Long.,  $7\frac{1}{2}$ —8 l.; lat.,  $4\frac{1}{3}$ — $4\frac{2}{5}$  l.

The male is easily recognised by the tubercles arranged in three pairs—one pair on front of the clypeus one on the clypeal suture and one on the front margin of the prothorax. If *Heteronychus vulgivagus*, Oll., was founded on a female example (as seems probable from the description) it is just possibly this species. The female however does not agree satisfactorily with Mr. Olliffe's description which mentions eight rows of punctures on the elytra—a number that can be attained only by counting in the confused puncturation between the rows—nor is the form of the clypeus at all satisfactorily characterised by the expression "head bisinuate in front." It may be noted that the male of this species (as of all its allies) has the apical ventral segment short, and gently emarginate behind; also that in this species the prothoracic quasi-excavation is small in area and is little more than a slight flattening of the surface.

N. Queensland; sent to me by Mr. French.

*I. lævipennis*, sp. nov. Mas. Ovatus, minus brevis; nitidus; brunneus, antennis palpis coxisque dilutioribus; clypeo modice producto, sat fortiter (plus minusve transversim) ruguloso, antice bidentato, marginibus modice reflexis, lateribus modice sinuatis; fronte a clypeo ut *I. bidentis* divisa, sat fortiter (postice minus distincte) ruguloso; prothorace quam longiori sesquialtiori, vix manifeste punctulato, antice subfortiter excavato, basi haud marginata quam apex (hoc in medio tuberculo parvo armato) plus quam duplo latiori, angulis anticis subacutis subprominulis posticis rotundato-obtusis; scutello sublævi; elytris fere lævibus, striis vix manifestis vix manifeste punctulatis impressis; propygidio stridulationis organis instructo (his rugis circiter sex sat elevatis compositis); pygidio sublævi; tibiis anticis extus minus fortiter tridentatis; tarsorum anticorum unguiculo externo bifido.

Fem. differt prothorace nec excavato nec tuberculato; unguiculis simplicibus; segmento ventrali apicali magis elongato, postice haud emarginato. Long., 6—8 l.; lat., 4— $4\frac{1}{2}$  l.

Easily distinguished from all known to me of its congeners by its elytra devoid of puncturation or at most with only a few punctures here and there, and they so faintly impressed as to be

scarcely traceable. The prothoracic excavation of the male is of small area but moderately deep.

W. Queensland (Mr. French); also taken by me near Oodnadatta in Central Australia.

*I. intermedius*, sp. nov. Mas. Sat late ovatus; nitidus; piceo-brunneus, antennis palpis pedibusque rufescentibus; clypeo minus producto, sat crebre ruguloso, antice rotundato-truncato, marginibus sat late sat fortiter reflexis, lateribus modice sinuatis; fronte a clypeo per carinam simplicem sat elevatam divisa, ut clypeus rugulosa; prothorace quam longiori plus quam sesquialtiori, sparsim subtilissime punctulato, antice sat fortiter excavato, basi haud marginata quam apex (hoc in medio tuberculo modico armato) plus quam duplo latiori, angulis anticis minus prominulis vix subacutis posticis rotundatis; scutello sublævi; elytris sat subtiliter punctulatis (seriebus 4 inter callum humeralem et striam subsuturalem, serie 2<sup>a</sup> a scutello et a callo humerali circiter æquidistanti, area minus lata inter seriem 1<sup>am</sup> et striam subsuturalem puncturis nonnullis impressa, parte extra seriem 4<sup>am</sup> confuse punctulata sed 1 vel forte 2 series sat distinctas ferenti, parte submarginali antice sat lævi postice subtiliter punctulata); propygidio stridulationis organo instructo (his rugis numerosis minus elevatis compositis); pygidio nitido, antice et latera versus sparsim punctulato; tibiis anticis extus sat fortiter tridentatis; tarsorum anticorum unguiculo externo bifido.

Fem. latet. Long., 7 l.; lat., 4½ l.

Superficially this species closely resembles *I. pecuarius*, Reiche, *puncticollis*, Macl. and *Meyricki*, Blackb., and it would certainly be most unnatural to separate it from them generically—nevertheless its claw structure places it with *I. levipennis*, Blackb., and *bidens*, Blackb., which if I had not seen this species I should be disposed to regard as generically distinct from *I. pecuarius*, &c. The prothoracic excavation in this species is large and deep as in *I. Meyricki*.

Queensland.

#### CHEIROPLATYS.

This genus is distinguishable from the other Australian *Dynastides* by the following characters in combination, viz., prothorax not simple in either sex (a tubercle or horn on the front margin in both sexes), hind tibiæ strongly ciliated at apex, basal joint of hind tarsi only moderately dilated at apex, club of antennæ not extraordinarily developed, front tibiæ externally bidentate or scarcely dentate at all in the male (tridentate in the female), one of the two apical spines of the hind tibiæ

inserted close to (or behind) the base of the tarsus, claws simple, mentum of normal form (not as in *Teinogenys*, &c.), head not armed with a horn in either sex, clypeal suture not or scarcely angulate in the middle, sides of clypeus not sinuate, mandibles invisible in repose, labrum strongly prominent, front marginal furrow of prothorax not or scarcely angulate hindward in middle, apical ventral segment traversed by a transversely sinuous furrow much more strongly defined in the female than in the male. All the species that I have examined are fulvo-hirsute on the underside and none of them have organs of stridulation. Eleven species have been attributed to this genus, of which two (*Ixion* and *porcellus*) are Boisduval's and are said to be identical with *curtus*, Guér., and *latipes*, Guér., respectively. As there is no evidence from Boisduval's descriptions that they are members of this genus I have no opinion as to the correctness of this alleged synonymy, but at any rate *Ixion* and *porcellus* may be eliminated from the list of valid species of *Cheiroplatys*. (*Scarabæus*) *curtus*, Guér., has been erroneously associated with *Cheiroplatys*, as Burmeister has pointed out. That learned author considers from the description that it is probably a *Dasygnathus*; to me the description reads more like that of a *Semanopterus*. To this latter genus I think Castlenau's species (*Phileurus subcostatus*) must certainly be referred, while (as pointed out above) *C. pecuarius*, Reiche, is an *Isodon*. Sir W. Macleay's two species (both from tropical Australia) seem to me very doubtfully referable to this genus, inasmuch as one of them (*C. inconspicuus*) is described as having its clypeus "broadly rounded and slightly emarginate in front" (a form to which no *Cheiroplatys* that I have seen approaches) and the other (*C. occidentalis*) as having its front tibiæ "bluntly tridentate" externally. If the type of *C. occidentalis* is a male (as the description implies) I doubt its being rightly placed in the genus; if it is a female it may be a *Cheiroplatys*, but in either case I am quite confident I have not seen it. Thus of the eleven species that have been associated with *Cheiroplatys* five must be definitely rejected, and two if rightly placed in the genus are very abnormal species that I have not seen. Of the remaining four I think I know *C. mælius*, Er., and I have examples which seem likely to be *C. latipes*, Guér., and *juvencus*, Burm. (as there does not seem to be any means of arriving at certainty on these identifications I propose furnishing characters that will enable these two species to be recognised, and claiming those names for them until cause be shown to the contrary). *C. lævipes*, Burm., I am fairly certain I have not seen. It is described as a large species (one inch long) with the clypeus strongly elevated in front, with the prothorax strongly punctulate in front but smooth along the base and



having a deep excavation in the male, and with the external margin of the front tibiæ entirely without teeth in the same sex.

The following is a tabulation of the species known to me of this genus. *C. lævipes* I have placed on the strength of characters furnished by Burmeister's description. Of *C. mælius* I have little doubt that I possess an example (from Tasmania), but it is a female, and moreover disagrees with the description in having a slight impression on its prothorax; it is better therefore not to risk confusion of synonymy by treating this identification as reliable, and the description (taken alone) is not detailed enough to enable me to point out distinctive characters. Neither of Sir W. Macleay's descriptions furnishes sufficient information for placing the species referred to in a tabulation, although (as already pointed out) characters are mentioned that satisfy me I have not seen the insects.

- |      |   |                                |
|------|---|--------------------------------|
| A.   | Base of the prothorax distinctly margined all across, scarcely obsoletely even in the middle. |                                |
| B.   | Two excavations on the prothorax (one behind the other, each preceded by a tubercle).         |                                |
| C.   | Prothorax very sparsely punctulate  | ... <i>bifossus</i> , Blackb.  |
| CC.  | Prothorax closely punctulate  | ... <i>accedens</i> , Blackb.  |
| BB.  | Prothorax with only one excavation and one tubercle.  |                                |
| C.   | Prothorax closely evenly and strongly punctulate  | ... <i>compactus</i> , Blackb. |
| CC.  | Prothorax much more sparsely and finely punctulate  | ... <i>juvencus</i> , Burm.    |
| CCC. | Prothorax closely punctulate in front, lævigata across the basal part...                      | ... <i>lævipes</i> , Burm.     |
| AA.  | Base of prothorax unmargined except close to the hind angles.                                 |                                |
| B.   | Prothorax closely and strongly punctulate   | ... <i>latipes</i> , Guèr.     |
| BB.  | Prothorax very sparsely and finely punctulate   | ... <i>pygmeus</i> , Blackb.   |

Regarding the statements of Burmeister and Erichson that the females of *C. juvencus* and *C. mælius* have no prothoracic impression, I may say that having examined a considerable number of females of this genus I have not seen one in which there is no trace of a prothoracic impression, and I am of opinion that the statements referred to are incorrect, their authors having either passed over a very slight impression as undeserving of mention or mistaken a female of another genus (*e.g.*, *Novapus* or *Isodon*) for a *Cheiroplatys*. I have invariably found that the female reproduces the prothoracic characters of the male in a modified form, *e.g.*, when the male has two strong excavations and two strong tubercles the female has two light impressions and two very small tubercles.

*C. bifossus*, sp. nov. Mas. Late subovatus; modice nitidus; colore variabilis (nigropiceus, vel brunneus); clypeo transversim ruguloso, antice truncato, marginibus erectis nec

altis (antice quam ad latera magis elevatis), lateribus rectis obliquis; fronte a clypeo per carinam sat rectam divisa sat rugulosa; prothorace quam longiori circiter sesquialtiori, longitudinaliter obsolete canaliculato, subtilius sparsius (antice ad latera sat crebre) punctulato, antice excavationibus 2 minoribus sat profundis impresso, ante excavationem utramque tuberculo magno armato, margine basali continuo quam margo anticus circiter ut  $1\frac{3}{4}$  ad 1 latiori, angulis anticis acutis posticis rotundato-obtusis; scutello subtilius ruguloso; elytris stria punctulata subsuturali profunda et puncturarum seriebus 8 (his per paria, vix manifeste in striis, dispositis) impressis, seriebus externis minus distinctis, pari 2° (a sutura enumerato) quam cetera breviori sed sat longe ultra elytrorum medium continuo, puncturis basin versus sat magnis sat profunde impressis postice gradatim subtilioribus, interstitiis inter paria puncturis (his serierum puncturis similibus) confuse impressis; pygidio confuse punctulato (sc. puncturis minutis sat crebris apicem versus minus crebris, et aliis majoribus apicem versus valde grossis, impresso); tibiis anticis fortiter dilatatis, extus ad medium subacute dentatis, parte dimidia apicali extus bisinuata. Long., 13 l.; lat.,  $7\frac{1}{5}$  l.

Owing to the reflexed front margin of the clypeus being gradually elevated from the sides to the middle and a little turned back, the front of the clypeus though in reality almost squarely truncate appears (if looked at from in front of it) to be strongly emarginate. The prothorax is scarcely narrower at its widest than the widest part of the elytra. A female example is unfortunately in extremely bad condition having evidently been found dead after long exposure to the elements. Its sculpture is much worn away and its front tibiæ are broken, but I can see that it has been almost identical with the male except in the prothoracic excavations much shallower, their tubercles very slight and the usual sexual differences in the ventral segments. Its form is somewhat narrower and more strongly convex than that of the male. The part of the apical ventral segment in front of the sinuous furrow is closely and rugulose but not coarsely punctulate, the rest of the segment nitid and almost without punctures. Similar sculpture exists on the corresponding segment in the male, but the furrow is so faint and so near the front margin of the segment that the sculpture needs careful looking for. In this species the puncturation of the prothorax is distinctly sparse; if it be carefully examined it will be seen that the intervals between puncture and puncture (except near the front angles) are for the most part quite equal to twice the diameter of an individual puncture.

Victoria.

*C. accedens*, sp. nov. Mas. Præcedenti (*C. bifosso*) valde affinis; differt statura minus lata, prothorace quam longiori paullo minus quam sesquialtiori, crebre minus subtiliter punctulato, margine basali quam margo anticus fere duplo latiori, pygidio (parte antero-exteriori excepta) haud puncturis minutis impresso; cetera ut *C. bifossus*.

Femina quam mas paullo minus lata magis convexa, prothoracis excavationibus et tuberculis subobsoletis, tibiis anticis extus obtuse distincte tridentatis. Long., 10—12 l.; lat., 5—6½ l.

This species is so like the preceding (*C. bifossus*) that the detailed description of the latter may be read as applying to it, subject to the distinctions noted. The puncturation of the prothorax is very widely different; if it be closely examined it will be seen that the intervals between puncture and puncture are for the most part scarcely equal to the diameter of a puncture. I have seen half-a-dozen specimens of this insect apparently all taken in company by Mr. Lea, and have taken others singly myself, and find that they vary very little except in the development of the prothoracic inequalities and to some extent in the closeness of puncturation on the pygidium. I find throughout the Australian *Dynastides* that the sculpture of the pygidium is a singularly unreliable character. The sculpture of the apical ventral segment in this species is as in *C. bifossus*. The front of the clypeus (looked at from in front) appears a trifle less strongly emarginate.

N.S. Wales; Forest Reefs; also Blue Mountains.

*C. latipes*, Guér. I have seen only a single female example (which was taken near Sydney) of a *Cheiroplatys* that can be called "oblong," the term its author and also Boisduval use to describe the form of *C. latipes* or "elongate-cylindric" (Burmeister's term). As it agrees very fairly with the diagnosis in other respects I take the example in question to be *C. latipes*. It is however not the *Cheiroplatys* that is evidently most common in the neighbourhood of Sydney, which I believe to be *C. juvenis* and refer to under that name below. Its length is 11½ l., its breadth 5 l. Its color on the upper surface is nearly black, on the under-surface red-brown. Its head is like that of *C. bifossus* except that the clypeus is more evenly and less strongly elevated in front, so that looked at from the front it appears very little sinuate. Its prothorax has only one impression (fairly strong in the example before me) and one tubercle, with puncturation (even closer than in *C. accedens*) much stronger and closer than that of *C. bifossus*, the base is distinctly margined only close to the hind angle. Its scutellum has no punctures except in two small clusters near the front. Its elytra are sculptured much like those of *C. bifossus* except that the intervals between the sub-

sutural stria and the first pair of rows of punctures, and between the first and second pairs of rows of punctures (are not confusedly and rather closely punctulate but) bear only a few punctures and they placed interruptedly in a longitudinal direction. Its pygidium is somewhat irregularly studded with rather large isolated punctures with which fine punctures are not intermingled except in the antero-external corners (and there not very closely). In other respects the description of *C. bifossus* applies to the present species.

*C. compactus*, sp. nov. Mas. *C. bifosso* sat affinis; minor; prothorace excavatione 1 et cornu brevi 1 solis instructo, multo magis crebre magis fortiter (fere ut *C. accedentis*) punctulato; scutello (parte antica subtilius rugulosa excepta) lævi; elytrorum interstitio inter striam subsuturalem et puncturarum seriatarum par primum magis grosse minus crebre (et inter paria primum et secundum serie unica) punctulatis, parte submarginali et apicali multo magis crebre punctulata; pygidio puncturis minutis minus crebre vel vix impresso; tibiaram anticarum parte apicali dilatata haud extus bisinuata.

Feminae prothoracis excavatione et tuberculo subobsoletis; tibiis anticis extus obtuse tridentatis. Long.  $10\frac{1}{2}$ —11 l.; lat., 6 l.

This species has a single large excavation and horn-like tubercle on its prothorax, with close comparatively coarse puncturation resembling that of *C. accedens*. Its elytra have their first interstice (between the subsutural stria and the first pair of rows of punctures) confusedly and strongly but not closely punctured, while the interstice between the first and second pairs of rows of punctures bears a single row of strong punctures. The pygidium of the male type has fine puncturation mixed with the coarser punctures but less closely than in *C. bifossus*; that of the females before me has very little fine puncturation. Compared with *C. latipes* (female) the female of this species is much less narrow and cylindric, with the prothorax evidently less closely punctulate, the first elytral interstice much more punctulate. The space in front of the furrow on the last ventral segment is closely rugulose and somewhat finely punctulate.

S. Australia.

*C. juvenicus*, Burm. The insect which I take to be this species is, I should judge, not uncommon in the neighborhood of Sydney; for though I have never taken it myself in my occasional collecting there I have not infrequently received it from Sydney correspondents. Comparing it with the description of *C. bifossus* (above) I find the following distinctions: the clypeus is very little elevated along its front margin and not more so in its

middle than at the sides, so that viewed from in front it appears only slightly emarginate; its size is much smaller (long.,  $8\frac{1}{2}$ —11 l.); its prothorax has only one excavation (a very large one) and only one tubercle (which is of the form of a short horn); its scutellum is lævigata except near the front where it is finely and closely rugulose; its elytral puncturation is a little finer and much less plentiful, the first interstice bearing only sparse confused punctures, the interstice between the first and second pairs of rows of punctures only a more or less interrupted row of fine punctures, and that between the second and third pairs only fine punctures usually disposed in a more or less interrupted row; the pygidium is devoid or nearly so of fine puncturation; the space in front of the furrow on the apical ventral segment is in the female almost without punctures or (in some examples) very sparingly punctulate; the apical dilatation of the front tibiæ of the male is not bisinuate externally.

*C. pygmæus*, sp. nov. Fem. Sat late subovatus; *C. bifosso* affinis; differt statura multo minore; prothorace multo magis sparsim punctulato, excavatione et tuberculo unicus instructo, ad basin haud marginato; elytrorum interstitio 1° sparsim, 2° 3° que uniseriatim, punctulatis; pygidio puncturis minutis haud impresso; cetera ut *C. bifossus*. Long.,  $7\frac{4}{5}$  l.; lat.,  $4\frac{2}{5}$  l.

I have ventured to describe this female because I have before me also a male (belonging to Mr. Lea) which however is slightly deformed I think and therefore not suitable to be regarded as a type; its elytra bear some unsymmetrical gibbosities which look as if caused accidentally, probably in the pupal condition. I can say however that it presents all the characters noted above as distinguishing the female from *C. bifossus*, also that the apical dilatation of its front tibiæ is not bisinuate externally.

This species differs from all those mentioned above in the extremely sparse puncturation of its prothorax on which (except near the front and lateral margins) the intervals from puncture to puncture are for the most part about three or four times the diameter of a puncture. It also differs in the base of its prothorax unmarginated except close to the hind angles. In the female the space on the apical ventral segment in front of the furrow is almost without punctures. The pygidium of the male example is notably less closely punctulate than that of the female and of *C. bifossus*.

N.S. Wales; taken by Mr. Lea near Forest Reefs.

#### NOVAPUS.

*N. bidentatus*, Blackb. In a recent re-examination of the *Dynastides* in my collection I observed with regret that this species is a *Xynedria* and that I was in error in describing it as

a *Novapus*. Moreover I am of opinion that it is not even specifically valid but is simply a very large example, with sexual characters very strongly developed of my *X. interioris*. *N. bidentatus* therefore must be regarded as a synonym of *X. interioris*.

*N. crassus*, Shp. I have recently examined male specimens from W. Australia (forwarded by Mr. Lea) of what I have no doubt is this insect. It is certainly distinct from all the *Novapi* that I have described, being nearest to *N. Adelaidæ* (from which it differs *inter alia* by its larger size, scutellum strongly and closely punctulate at least in the front of the middle part, and evidently larger and coarser elytral punctures).

ASEMANTUS (gen. nov. *Dynastidarum*).

Mentum ovale, antice minus angustum; maxillæ robustæ 6-dentatæ; mandibula magna superne conspicua ad apicem obtuse (extus nullo modo) dentata; clypeus a fronte vix distinctus antice angustatus ad apicem recurvus, frons media tuberculo crasso brevi armata; antennæ 10-articulatæ flabello modico; prothorax antice sat late minus profunde excavatus, postice fovea magna (hac puncturis sat grossis impressa) instructus; elytra sat convexa, puncturis seriatis geminatim impressa, interstitiis haud vel vix convexis; pedes robusti, tibiis anticis extus tridentatis posterioribus 2-carinatis, tarsorum posticorum articulo basali (præsertim femine) extus sat fortiter lobato, tarsorum anticorum maris unguiculis inæqualibus, tibiis posticis ad apicem lobatis ciliatis; stridulationis organa nulla.

This genus is very close to *Semanopterus* but differs from it by the short basal joint of its hind tarsi which is strongly dilated externally at the apex in a kind of lobe (especially in the female) and by the claws of the front tarsi in the male being unequal (one of them is thicker than the other and is abruptly turned back under the claw joint). The sexes present no distinguishing characters on the upper surface; the apical ventral segment is (as in allied genera) widely and feebly emarginate in the male. The only species I can refer to the genus is one which I believe to be *Semanopterus subæqualis*, Hope, but Hope's description is so defective that it is impossible to be very confident of this identification; the description calls the elytra "fere æqualia" but further on refers to them as having "elevated lines;" I presume this means that there are some scarcely elevated spaces on the elytra, and if this is the correct interpretation I have little doubt the insect before me is *S. subæqualis*. It cannot however stand in the same genus as *S. Adelaidæ*, Hope, which that learned author seems to have regarded as the type of his genus

*Semanopterus*. Although it is difficult to believe that Burmeister could have placed this insect in the genus *Scapanes* I may say that the description of *S. solidus*, Burm., reads much like a description of its female, examples of which not rarely present the peculiar coloring he attributes to *S. solidus*.

A. *subaequalis* (? Hope). Late subovatus; colore variabilis (nigro-piceus, piceus, vel rufescens); subtus rufo-hirtus; sat nitidus; fortiter convexus; capite transversim sat crebre rugato, tuberculo valido brevi armato; prothorace quam longiori paullo plus quam sesquialtiori, postice quam antice ut  $1\frac{5}{7}$  ad 1 latiori, antice excavatione sat magna minus profunda (hac intus squamose sat grosse punctulata) et postice excavatione purva ovali (hac intus fortiter punctulata) impresso, lateribus minus rotundatis, subtilissime (antice crebrius, postice sparsim) punctulato, angulis anticis acutis sat productis posticis rotundato-obtusis; scutello basin versus punctulato; elytris subtiliter punctulatis, puncturis ut series 8 geminatim dispositis, interstitiis haud vel vix convexis inter serierum paria ut series (sed confuse sparsim) punctulatis, parte apicali confuse magis fortiter punctulata; pygidio fortiter gibboso.

Maris pygidio longitudinaliter leviter sulcato, sparsim subtiliter ad basin crebre subtilissime) punctulato; segmentis ventralibus (basali et apicalis parte basali crebre rugulosis exceptis) nitidis transversim uniseriatim punctulatis.

Feminae pygidio grosse squamose ruguloso, fulvo-hirto; segmentis ventralibus (apicali quam cetera magis crebre) squamose sat grosse rugulosis.

Australia; widely distributed.

#### SEMANOPTERUS.

This genus is placed by M. Lacordaire provisionally among the *Phileurides* on account of the general resemblance of Hope's figure to the appearance of a *Phileurus*. The labial palpi of *Semanopterus* are inserted low down on the sides of the mentum in such fashion that their basal joint is very little visible from above; nevertheless I cannot satisfy myself that the genus ought to be very widely separated from *Cheiroplatys* and its allies. The following characters in combination distinguish *Semanopterus* from the other known Australian *Dynastides*,—viz., Prothorax with two excavations in both sexes, hind tibiae with apical ciliae, basal joint of hind tarsi not excessively dilated at apex, club of antennae not extraordinarily developed in the male, three external teeth on the front tibiae, one of the two apical spines of the hind tibiae inserted more or less behind the base of the tarsus, mentum not of the compressed type, head armed with a blunt tubercle in

both sexes, clypeal suture wanting or very faint, sides of clypeus scarcely (or very feebly) sinuous, mandibles visible in repose, labrum not prominent, front marginal furrow of prothorax not angulated hindward in the middle, organs of stridulation wanting; claws of male simple.

The following is a tabulated statement of the distinctive characters of the *Semanopteri* known to me. *S. (Phileurus) subcostatus*, Cast., might be almost any *Semanopterus* but is probably *Adelaidæ*, Hope. *S. subæqualis*, Hope, is probably the insect for which I propose the new generic name *Asemantus*. I have seen no *Semanopterus* that agrees with the description of *S. depressus*, Hope, or *depressiusculus*, Macl. *S. convexiusculus* might possibly be identical with my *S. punctiventris*, but as the brief description of it implies that the hind corners of the prothorax are not excised, I think its identity very improbable.

- |      |   |                               |
|------|---|-------------------------------|
| A.   | Sides of prothorax not (or scarcely) sinuate nor strongly incurved in front of base.  |                               |
| B.   | Pygidium (at any rate near its base) opaque through the presence of fine close strigosity.  |                               |
| C.   | Punctures of the pygidium near its apex quite isolated and very sparse ... ..   | <i>Adelaidæ</i> , Hope.       |
| CC.  | The whole surface of the pygidium opaque through close strigosity in the female, rather closely and coarsely punctured near apex in the male ... .. | <i>meridianus</i> , Blackb.   |
| BB.  | Pygidium not opaque through close strigosity  | <i>longicollis</i> , Blackb.  |
| AA.  | Sides of prothorax not or scarcely sinuate, but strongly rounded, and strongly incurved in front of base.   |                               |
| B.   | Pygidium pilose.  |                               |
| C.   | Sculpture of pygidium concentric in male ... ..   | <i>concentricus</i> , Blackb. |
| CC.  | Sculpture of pygidium not concentric in male ... ..   | <i>angustatus</i> , Blackb.   |
| BB.  | Pygidium not pilose ... ..  | <i>minor</i> , Blackb.        |
| AAA. | Hind corners of prothorax (viewed from above) strongly excised.   |                               |
| B.   | Hind excavation of prothorax very lightly impressed.  |                               |
| C.   | The elytral costæ quite feebly developed.   |                               |
| D.   | Puncturation of prothorax much finer and sparser near the hind excavation than on the sides ... ..  | <i>carinatus</i> , Blackb.    |
| DD.  | Puncturation of prothorax evenly distributed and comparatively strong ... ..  | <i>persimilis</i> , Blackb.   |
| CC.  | The elytral costæ very elongate and well elevated ... ..  | <i>tricostatus</i> , Blackb.  |
| BB.  | Hind excavation of prothorax deep and elongate-foveiform.   |                               |
| C.   | Anterior ventral segments not punctured in the middle ... ..  | <i>rectangulus</i> , Blackb.  |
| CC.  | Anterior ventral segments punctured in the middle ... ..  | <i>distributus</i> , Blackb.  |
- S. meridianus*, sp. nov. Convexus; nitidus; piceus vel rufescens,



subtus fulvo-hirsutus; capite transversim rugato, tuberculo frontali armato; prothorace quam longiori fere sesquialtiori, profunde (interrupte vel continenter) canaliculato, sparsius subtilius (in canaliculæ fundo sat crasse squamose) punctulato, lateribus modice arcuatis postice vix sinuatis; scutello vix distincte punctulato; elytris tricostatis (sutura costata haud inclusa), costa externa fere obsoleta, interstitiis sat crebre subseriatim punctulatis, parte apicali crebre confuse punctulata.

Maris prothoracis canalicula antice leviter dilatata; pygidio antice crebre strigoso, postice crebrius sat fortiter punctulato.

Feminae pygidio toto crebre æqualiter strigoso. Long.,  $6\frac{1}{2}$ —9 l.; lat.,  $3\frac{1}{2}$ — $4\frac{1}{2}$  l.

This species is very like that which I take to be *S. Adelaide*, Hope, differing from it by the external of the three elytral costæ being almost non-existent and by the sculpture of the pygidium. In the male this segment is throughout more roughly sculptured, the basal strigose portion much narrower and the punctures of the apical portion coarser and closer. In the female the entire segment is closely and evenly strigose, while in *S. Adelaide* the apical portion is impressed more or less sparsely with isolated punctures on a nitid surface.

Western N.S.W.; Bindagundra; sent by Mr. Lea.

*S. concentricus*, sp. nov. Convexus; nitidus; piceus vel rufescens, subtus et in pygidio fulvo-hirsutus; capite transversim vel fere subconcentrice rugato, tuberculo frontali armato; prothorace quam longiori sesquialtiori, profunde canaliculato, sparsius subtilius (in canaliculæ fundo sat crasse squamose) punctulato, canalicula ante medium ut excavatio subcircularis (pone medium ut excavatio ovalis angusta) dilatata, lateribus fortiter arcuatis postice vix sinuatis; scutello fere lævi longitudinaliter subtiliter canaliculato; elytris tricostatis (sutura costata haud inclusa), costa externa fere obsoleta, interstitiis sparsim plus minusve seriatim punctulatis, parte apicali leviter crebrius punctulata.

Maris prothoracis canaliculæ excavatione antica sat profunda; pygidio sparsim hirsuto, concentrice rugato, in area centrali parva sat fortiter punctulato.

Feminae prothoracis canaliculæ excavatione antica minus profunda; pygidio dense hirsuto, prope basin crebre rugato, in cetera parte crebre æqualiter granuloso-punctulato. Long.,  $7$ — $9\frac{1}{2}$  l.; lat.,  $3\frac{3}{4}$ — $5$  l.

Differs from *Adelaide*, *meridianus*, and *longicollis* by the more strongly rounded sides of its prothorax which are strongly, but

scarcely sinuously, incurved close to the base. The costæ of the elytra are much like those of *meridianus*, but do not extend so far back and the intervals between them are more finely and less plentifully punctulate. This species is also distinguished from most of its congeners by the pilosity of its pygidium and from nearly all of them by the sculpture of that segment.

W. Australia; sent to me by Messrs. J. J. Walker and Lea.

*S. angustatus*, Blackb. This species is certainly rather close to *S. concentricus*, but I am convinced it is distinct. The principal difference seems to be that the costæ of its elytra are markedly feebler—in fact almost obsolete; and that its pygidium is in the male notably less closely (and not concentrically) strigose with a larger and more nitid punctured space in the centre in which the strigosity is much less distinct, while in the female the pygidium is (not closely granulose-punctulate but) confusedly and by no means closely strigose, with an evident intermixture of defined punctures—in fact not much different from the same segment in the male.

*S. tricostatus*, sp. nov. Convexus; nitidus; piceus; subtus fulvo-hirsutus; capite strigoso et sat distincte punctulato, tuberculo armato; prothorace quam longiori plus quam sesquialtiori, pone medium leviter canaliculato, sparsius (ad latera magis crebre) sat distincte punctulato, lateribus sat rotundatis ante basin sinuatis (superne visis profunde excisis apparentibus); scutello puncturis nonnullis impresso; elytris tricostatis (sutura costata haud inclusa), costis (ut *S. Adelaide*, Hope) bene elevatis et ad callum subapicalem continuis, interstitiis sat crebre subseriatim punctulatis, partibus lateralibus et apicalibus crebre confuse sed quam interstitia vix minus fortiter punctulatis.

Maris prothoracis canalicula ante medium ut excavatio circularis sat profunda dilatata; pygidio confertim subconcentrice rugato.

Fem. latet. Long.,  $7\frac{1}{2}$ — $8\frac{1}{2}$  l.; lat.,  $4$ — $4\frac{1}{2}$  l.

This is a very distinct species with strongly sculptured elytra almost exactly like those of the insect that I take to be *S. Adelaide*, Hope, but with a prothorax closely resembling the prothorax of *S. carinatus* and *persimilis*. A single male example sent by Mr. Cowley from N. Queensland seems indistinguishable but perhaps the knowledge of the females might reveal differences.

W. Australia; near Geraldton (Lea), &c.

*S. distributus*, sp. nov. Convexus; nitidus; piceus vel rufescens, subtus fulvo-hirsutus; capite transversim vel fere subconcentrice rugato, tuberculo armato; prothorace quam longiori sesquialtiori, profunde canaliculato, sparsius subtilius (in

canaliculæ fundo sat crasse squamose) punctulato, canalicula ante medium ut excavatio variabilis (pone medium ut excavatio ovalis angusta) dilatata, lateribus sat rotundatis ante basin sinuatis (superne visis profunde excisis apparentibus); scutello minus distincte punctulato; elytris tricostatis (sutura costata haud inclusa), costis internis ultra medium distinctis externa fere obsoleta, interstitiis sat crebre subseriatim punctulatis, partibus lateralibus et apicalibus crebre subtiliter confuse punctulatis; segmentis ventralibus anterioribus punctulatis.

Maris prothoracis canaliculæ excavatione antica sat profunda circulari, feminae minus profunda magis elongata; maris pygidio confertim subconcentrice rugato, feminae hirsuto crebre sat fortiter punctulato (antice et ad latera sat subtiliter rugato. Long.,  $7\frac{3}{4}$ —9 l.; lat.,  $4\frac{1}{5}$ — $4\frac{2}{3}$  l.

This species is very like *S. rectangulus*, Blackb. It is distinctly larger and more elongate and may be readily distinguished by its anterior ventral segments being quite coarsely squamose-punctulate and its pygidium pilose in the female.

Victoria and N.S. Wales.

#### PALMERSTONIA.

Under this name I separated the Australian species that had been attributed to *Horonotus*, chiefly on the ground of their females being devoid of prothoracic excavation or tubercle.

*P. (Horonotus) variolicollis*, Fairm. In Tr. Roy. Soc., S.A., 1895, p. 40, I expressed the opinion that this is likely to be identical with *P. (H.) optata*, Shp. I have received from Mr. Cowley examples of Dr. Sharp's species taken in N. Queensland and with them other examples that may possibly represent a distinct species and may be Fairmaire's very briefly described insect. They differ from typical *optatus* in having the cephalic-horn much shorter and of the form of an erect triangular lamina, and the coarse puncturation of the sides of the prothorax continuous across the base.

*P. pusilla*, sp. nov. Sat brevis; picea, supra nitida; subtus sat dense fulvo-hirsuta; prothorace grosse ruguloso; elytris vix punctulatis.

Maris capite lamina triangulari verticali armato; prothorace antice retuso; hujus parte retusa (area longitudinali mediana sat alta sparsim punctulata excepta) ut prothoracis superficie cetera crebre grosse rugulosa, haud ultra prothoracem medium extensa, postice tuberculo parvo armata.

Fem. latet. Long.,  $5\frac{1}{2}$ — $6\frac{1}{2}$  l.; lat.,  $3\frac{1}{5}$ — $3\frac{3}{4}$  l.

The males of the *Dynastides* vary to such an infinite extent in their sexual character that I cannot but recognise the possibility

of this pygmy turning out to be an extreme form of *P. optata*, Shp., but among half a dozen typical specimens of the latter I have seen none intermediate. The striking difference between this species and *P. optata* and *variolicollis* is the small size of the excavation of the prothorax (which does not reach back beyond the middle of the segment) its having at the middle of its hind margin only a minute tubercle; and the rough sculpture of the prothorax being continuous over the whole surface except a thinly punctulate area running along the middle of the excavated portion. The examples before me are undoubtedly males.

N. Queensland; sent by Mr. Cowley.

*P. Bovilli*, Blackb. I have received from Mr. Cowley a specimen taken in N. Queensland which I believe to be the male of this species. It is very large (long.,  $13\frac{1}{2}$  l.) and differs from *P. optata*, Shp., in its frontal horn being much shorter and resembling a triangular lamina with the apex bent hindward, in its prothorax almost punctureless (there are a few subobsolete punctures in the hind angles), in its prothoracic excavation very wide but only reaching back to the middle of the segment and having three strong pointed tubercles along its hind margin, and in the median opaque stripe on its propygidium occupying nearly the whole width of the segment so that only the extreme margins of the segment are less minutely sculptured.

#### NEOCAVONUS.

*C. bidens*, sp. nov. Sat nitidus; piceo-rufus, elytris nigris; subtus fulvo-hirsutus; elytris fortiter punctulato-striatis, striis vix geminatis, interstitiis fere lævibus.

Maris clypeo subverticali fortiter transverso vix manifeste punctulato, antice rotundato, basi fortiter carinato, marginibus fortiter reflexis; prothorace quam longiori sesquialtiori, antice late retuso, in margine anteriori tuberculo magno bifido armato, antice sat crebre subfortiter (postice minus distincte) punctulato; pygidio sat fortiter (antice et ad latera quam in ceteris partibus magis crebre) punctulato.

Fem. a mari differt prothorace æquali, antennarum clava quam ceteri articuli conjuncti paullo breviori, segmento ventrali apicali haud emarginato, tarsis posticis brevibus. Long., 6 l.; lat.,  $3\frac{1}{2}$  l.

Easily distinguishable from its described congeners by the strongly bifid tubercle on the front margin of its prothorax.

S. Australia.

#### PIMELOPUS.

The following characters in combination distinguish *Pimelopus* among the Australian *Dynastides*,—viz., clypeus straight on

the sides, its front margin usually somewhat sinuate, its base feebly carinate and furnished in the middle with a feeble tubercle in the male; prothorax without any discal depression or elevation in either sex, usually with a small fovea on either side near the lateral margin and a feeble basal impression on either side of the middle; elytra more or less punctulate-striate, the striae not geminate; antennal club small in both sexes; mentum evidently though not strongly compressed (considerably more ridge-like, e.g., than in *Cheiroplatys* or *Novapus*), mandibles in repose but little visible; front tibiae tridentate in both sexes, posterior tibiae bicarinate; apex of hind tibiae ciliate, one of its apical spines inserted more or less behind the base of the tarsus; basal joint of hind tarsi short and very widely dilated at apex; claws simple in both sexes. M. Lacordaire asserts that there are organs of stridulation in two rows on the propygidium, but I have not succeeded in finding organs of stridulation in any *Pimelopus* that I have examined.

This genus is near my *Pseudopimelopus* which differs from it by the presence of a strong cephalic horn and a large prothoracic excavation in the male, and by the front claws being unequal in the same sex,—also by the sub-basal carina on the posterior tibiae (especially the hind pair) being notably feebler and the rows of punctures on the elytra running in pairs.

I have already (Tr. Roy. Soc., 1887, p. 217) stated and given reasons for my opinion that Burmeister (and Lacordaire following his authority) was in error in thinking that the female on which Erichson formed the genus *Pimelopus* appertained to a species whose male exhibited the characters specified above as distinctive of *Pseudopimelopus*. I think there is no reasonable doubt in the matter and that consequently the only true *Pimelopus* described previously to 1887 was the typical species of the genus (unless *P. lævis*, Burm., be another; it is described on a female and almost certainly appertains to some other genus; at any rate is not as a species at all like any species known to me as congeneric with *P. porcellus*, Er.). In 1887 I added two species to the genus,—one of them doubtfully, but subsequent study confirms its place,—and I now have to describe another species of which I took a female some years ago in N.S. Wales and have since received both sexes (taken near Sydney) from Mr. Lea. The following table shows some of the distinctive characters of the species,—which are very closely allied and differ chiefly in the structure of the hind tarsi and the sculpture of the elytra. It is to be noted that as far as my observations go Lacordaire's statement that *Pimelopus* has organs of stridulation is incorrect (it does not appear that that author had seen a true *Pimelopus*), and also that the tubercle on the head of the female mentioned

by Burmeister and Lacordaire is scarcely noticeable; Erichson in characterising the genus did not mention either organs of stridulation or a tubercle on the head. I have before me a fairly long series of a species that is almost certainly *P. porcellus*, Er., with the description of which it agrees well. I described this species (Tr. Roy. Soc., S.A., 1887, p. 220) as "*P. porcellus*, Er. (?)" but subsequently have examined fresh series of it and think there is very little doubt of its being *porcellus*, and shall so consider it until evidence to the contrary turns up.

- A. The striæ and rows of punctures well defined to considerably behind the middle of the elytra.  
 B. Hind tarsi very short, their third joint scarcely (in the female not) longer than wide ... *crassus*, Blackb.  
 BB. Hind tarsi less short, their third joint markedly longer than wide.  
 C. Subsutural region of elytra coarsely and rather closely punctured; subsutural striæ strongly impressed in front ... *porcellus*, Er.  
 CC. Subsutural region of elytra lævigata or nearly so; subsutural striæ very lightly impressed ... *sydneyanus*, Blackb.  
 AA. The striæ and rows of punctures scarcely reach the middle of the elytra ... *dubius*, Blackb.

*P. sydneyanus*, sp. nov. Ovatus; fortiter convexus; sat nitidus; ferrugineus, subtus hirsutus; capite ruguloso, clypeo antice leviter bisinuato; prothorace lævigato; elytris sat fortiter punctulato-striatis, striis longe ultra medium continuis (suturali in nulla parte fortiter impresso), interstitiis fere lævibus; pygidio ad basin crebre punctulato, in cetera parte lævi; tarsis posticis sat brevibus, articulo basali ad apicem extrorsum sat fortiter dilatato, articulo 3° quam latiori sat longiori.

Maris capite vix manifeste tuberculato.

The male is scarcely distinguishable from the female except by the emargination of the apical ventral segment and the greater convexity of its pygidium.

N.S. Wales.

#### ANEURYSTYPUS.

I characterised this genus in Tr. Roy. Soc., S.A., 1887, on a S. Australian species which I named *A. calvus*. Subsequently I have seen other species some of which I described in Pr. L.S., N.S.W., 1890, and I took the opportunity of writing those descriptions to mention that the generic characters I had drawn from the mouth organs of *A. calvus* did not seem to be truly generic as they were not exactly reproduced in other species that had come under my notice. The examination of still additional species confirms this observation and also shows an apparent difference in the form of the mentum even between individuals of

a species. I suspect however that this is more apparent than real as the mentum when the insect has its mouth open is more prominent than if the mouth be closed; this point could be cleared up only by dissecting a number of conspecific examples, but unfortunately these species are rare and I have not yet received or collected any in sufficient numbers for the purpose. But at any rate within the range of *species* that cannot possibly in my opinion be removed generically from *A. calvus* there is considerable variety in the mouth organs and especially in the mentum, some having the mentum only gently convex (as is the case with *A. calvus*) and others having it quite strongly compressed and even carinate down the middle line; in *A. calvus* the hind part is gently concave down the middle, the concavity however ceasing in the front part which is entirely convex. In *Corynophyllus* (as far as my observations go) the mentum is invariably flat (or at any rate notably less convex than in any *Aneurystypus*) and I think this is a reliable distinction between the genera which (as I have already pointed out) are also distinguishable *inter se* by the form of the antennal club, the joints of which are in *Aneurystypus* narrow elongate and parallel while in *Corynophyllus* the corresponding joints are much wider and are ovate in form. *Teinogenys* must be very near to *Aneurystypus* but no doubt differs as the described species are evidently quite unlike the described *Aneurystypi* as species. I have not an authentic type of *Teinogenys* and therefore do not feel able to speak authoritatively about it though I have little doubt I know it.

The following tabulated statement will show distinctive characters for the six described species of this genus:—

- |     |  |                              |
|-----|--|------------------------------|
| A.  | Antennal club very long,—more than half again as long as the rest of the joints together.  |                              |
| B.  | Front of prothorax armed with a strong tubercle.   |                              |
| C.  | Clypeus subvertical ... ..   | <i>calvus</i> , Blackb.      |
| CC. | Clypeus nearly continuous in direction with the rest of the head ... ..  | <i>aurilegulus</i> , Blackb. |
| BB. | Front of prothorax unarmed.  |                              |
| C.  | Clypeal suture carinate, armed with a strong median tubercle ... ..  | <i>metallicola</i> , Blackb. |
| CC. | Clypeal suture feebly defined, unarmed ... ..  | <i>collaris</i> , Blackb.    |
| AA. | Antennal club much shorter.  |                              |
| B.  | Clypeus subvertical, narrow ... ..   | <i>dives</i> , Blackb.       |
| BB. | Clypeus much wider nearly continuing the plane of the rest of the head ... ..  | <i>Richardse</i> , Blackb.   |
| A.  | <i>aurilegulus</i> , sp. nov. Mas. Castaneus; subtus dense longe fulvo-hirsutus; clypeo (hoc subhorizontali) squamose, vertice rugulose, prothorace sparsius minus subtiliter, scutello subtilius inæqualiter, pygidio sparsissime (ad latera sat crebre) punctulatis; elytris puncturarum seriebus circiter |                              |

10 minus regularibus (his vix geminatis) instructis, interstitiis (ex his nonnullis leviter convexis) punctulatis; antennarum flagello quam articuli ceteri conjuncti fere ut  $1\frac{2}{3}$  ad 1 longiori; prothorace excavatione magna (hac fere ad basin extensa) impresso, antice tuberculo armato.

Fem. latet. Long., 7 l.; lat.,  $4\frac{1}{5}$  l.

The clypeus has the usual rounded outline and concave surface and almost continues the plane of the hinder part of the head instead of (as in some species) being sub-vertical. The clypeal suture is only moderately cariniform. The part of the head behind the clypeal suture is remarkably sculptured; from either end of the clypeal suture a strong carina runs sinuously backward and meets its fellow-carina at the back of the head thus enclosing a subtriangular flattened area. The prothoracic excavation is larger than in any other *Aneurystypus* or any *Corynophyllus* known to me. The elytral puncturation is (for this genus) exceptionally plentiful; there are about ten fairly distinct rows of punctures placed (not very noticeably) in pairs, the interstices between the two of a pair being irregularly a little convex and scarcely punctulate, while the others are punctured similarly to the series but somewhat confusedly.

W. Australia; taken by Mr. T. W. G. Blackburn near Coolgardie.

*A. dives*, sp. nov. Mas. Castaneus; subtus dense longe fulvohirsutus; clypeo (hoc subverticali) sparsius, vertice crebrius rugulose, prothorace sparsim subtiliter, scutello vix manifeste, pygidio sparsissime, punctulatis; elytris striis punctulatis; elytris striis punctulatis circiter 6 impressis, interstitiis in disco vix manifeste (parte laterali sparsim sat distincte) punctulatis; antennarum flagello quam articuli ceteri conjuncti fere ut  $1\frac{1}{4}$  ad 1 longiori; prothorace excavatione transversa (hac in medio retrorsum anguste producta) leviter impresso, antice tuberculo acuto armato.

Fem. latet. Long.,  $7\frac{1}{2}$  l.; lat.,  $4\frac{2}{5}$  l.

At once distinguishable from the preceding species by its sub-vertical clypeus and the absence of carinæ behind the clypeus, also by the very faintly impressed and smaller excavation of its prothorax, its striate and much less punctulate elytra, the absence of comparatively close puncturation on the sides of the pygidium, &c.

W. Australia; Coolgardie; sent by Mr. Lea.

#### RHIPIDOCERIDÆ.

##### CALLIRRHIPIS.

*C. cardwellensis*, sp. nov. Mas.? Picea, subrufescens; sat nitida; capite verticali; prothorace quam longiori sesqui



latiori, subtilissime sparsius (antice paullo minus sparsim) punctulato, angulis anticis nullis posticis minutis acutis retrorsum directis, basi fortiter bisinuata; scutello sub-circulari fere lævi; elytris subtiliter sat crebre punctulatis et costis 4 vix manifestis instructis; antennarum lamellis in articulis 3°—8° gradatim magis elongatis, in articulis 8°—11° inter se sat æqualibus (his lamellis quam antenna tota circiter triplo brevioribus). Long., 10 l.; lat., 3½ l.

Differs widely from *C. ruficornis*, Gray (the only Australian *Callirrhypis* yet described) by its finely punctured and non striate elytra.

N. Queensland; Cardwell; in the collection of Mr. French.

### LONGICORNES.

#### ANATISIS.

*A. Muelleri*, sp. nov. Mas. Piceus, elytris pedibusque rufescentibus; pilis (his in capite prothoraceque fulvis maculatim condensatis, in elytris abdomineque albis sparsim dispositis, in metasterni latere niveis dense lineatim condensatis) vestitus; prothorace brevi, grosse vermiculato-ruguloso, ad latera rotundato; scutello dense fulvo-piloso; elytris antice grosse (apicem versus obsolete) punctulatis, apice suturali spiniformi; antennis ut *A. laminosi*, Newm., laminatis. Long., 10 l.; lat., 3½ l.

Differs from *A. laminosus*, Newm., by its evidently shorter and wider form, its prothorax shorter, more rounded on the sides and more coarsely sculptured, its elytra with the sutural apex spiniform, their puncturation coarser, the coloring and arrangement of the pilosity, &c. Dedicated to the late Baron von Mueller.

N. Queensland; in the collection of Mr. French.

### PHYTOPHAGA.

#### OIDES.

*O. tigrina*, Blackb. In describing this species at p. 81 (Part I.) of the present vol. I accidentally omitted to state that it was taken by Mr. Cowley in N. Queensland.

#### AULACOPHORA.

*A. cucullata*, Blackb. In describing this species at p. 83 (Part I.) of this present vol. I accidentally omitted to state that it was taken in N. Queensland and sent to me by Mr. Masters.

## NOTES ON A BORE AT ENFIELD, NEAR ADELAIDE.

By WALTER HOWCHIN, F.G.S.

[Read December 3, 1895.]

In 1887 Mr. Rake, of Enfield, put down a bore near his homestead with the hope of finding water suitable for his stock at a moderate depth. The bore was continued to a depth of 154 feet, but as only a small flow of brackish water was tapped Mr. Rake was discouraged and stopped the work. I paid several visits to the spot when the works were in progress, and obtained samples of the material at various depths. A hope that Mr. Rake would pursue his investigations further led me to defer publishing the results until now, but as there seems little probability that boring operations will be resumed, I have decided to place the particulars on record.

The site of the bore is on a flat-topped ridge which extends from North Adelaide to Dry Creek. The ridge has an elevation of about 100 feet above the plains of the seaboard on the one side, and the valley of the Torrens on the other. It is thus to some extent isolated, and occupies a higher elevation than the alluvial plains in the vicinity.

*Lithological Features.*—If we except the first four feet, which was in the ordinary surface travertine of the neighbourhood, the bore can be roughly divided into three portions.

1. An upper series of variously colored clays—blue, grey, red, and mottled with a three feet layer of coarse sand and gravel near the base, the whole reaching a depth of 58 feet.

2. Variously colored sands, mostly very fine, and having a thickness of about 32 feet. The first 6 feet of these sand beds exhibit a wonderful diversity of bright colors in distinct bands—yellow, grey, bright red, pale red, pink, and white follow in descending order, the grains of sand for the most part being uniformly about one-hundredth of an inch in diameter.

Immediately under these highly-colored bands of sand a (?) freshwater limestone, two feet thick, was met with resting on a bed of clay about six feet thick. Below this clay there is a thick bed (18 feet) of yellow and white sand, so extremely fine and uniform in size that it nearly all passes through a two-hundredth of an inch mesh.

3. A series of lower clay beds (separated from the overlying sands by a foot of pipeclay), and reach a thickness of 64 feet. These clays are very compact and even finely laminated, which features distinguish them from the more plastic clays of the upper portions of the bore.

*Geological Features.*—The beds passed through are apparently of alluvial and lacustrine origin. The thick sand beds with grains of uniform size, as well as the limestone, were probably laid down under lacustrine conditions. The only indisputable evidence of fossil remains was the impression of a spire of a gastropod shell in the limestone, but too indefinite to indicate its generic affinities. The geological horizon of these beds can, therefore, only be surmised from their lithological features. They certainly do not correspond with the Pliocene clays and drifts of the Adelaide Plains. The fine, clean sands, the (?) fresh-water limestone, and the highly indurated condition of the lower clays are points of difference.

In examining some of the material microscopically, I observed small siliceous granules which had to all appearance been formed from colloid silica.

The River Torrens, in passing between North Adelaide and the city, cuts through the ridge referred to at right angles, and exposes the marine Miocenes in its banks. The travertine crust, which is a marked feature of this ridge from North Adelaide to Enfield, probably indicates an extension of the Miocene beds in that direction. Whether they actually extend in a northerly direction as far as the bore now described has been left unfortunately an undecided point, as the bore was not deep enough to settle the question.

The beds passed through in the Enfield bore certainly exhibit some resemblance to the variegated clays and sands of the Miocene beds at Hallett's Cove. It is not unlikely that they represent the eastern fringe of an Upper Miocene formation that once, more or less covered the plains to the westward, but has been removed by the denuding forces that immediately preceded or were coincident with Pliocene times.

[For particulars of the Boring see next page.]

ENFIELD BORE, NEAR ADELAIDE.

TABLE OF STRATA.

No.	Thickness of Bed in Feet.	Depth from Surface.	Description of Bed.
1	4	4	Travertine limestone.
2	21	25	Very stiff bluish-grey clay of uniform features.
3	10	35	Arenaceous red clay. Sand very fine and of uniform size.
4	9	44	Subangular gravel in red clay.
5	10	54	Mottled red and white clay, compact, and of uniform features, passing into dark red sand, the grains one-fiftieth inch in diameter.
6	3	57	Coarse sand and gravel (subangular), chiefly quartz with clay.
7	1	58	Bluish-grey arenaceous clay, streaked with brown.
8	6	64	Thin beds of variegated sands, mostly very fine and clean, as follows :— (a) Greyish-yellow sand, half of which passes through a hundredth-of-an-inch mesh—the rest a trifle larger. (b) Grey sand, very uniform, nearly all passes through the hundredth-of-an-inch mesh. (c) Bright red sand, half passes through the one-hundredth-inch mesh. (d) Light red sand, grains of same size as preceding. (e) Pink-coloured sand, grains having an average size of one-thirtieth of an inch. (f) Very fine white sand in clay cement. (g) Coarse gritty, white and grey sand, held together with a small proportion of pipe clay.
9	2	66	White limestone (? fresh-water) with fossil impressions. Residue after solution of $\text{Ca CO}_3$ in $\text{H Cl.}$ subangular quartz.
10	2	68	Grey-coloured clay. Residue, after washing, very fine white sand—translucent quartz grains of uniform size.
11	4	72	Yellowish-grey clay of uniform features, and giving a residue, after washing, of very fine sand.
12	10	82	Very fine yellowish sand, of uniform size, two-hundredth of an inch in diameter.
13	2	84	Very fine white sand, of uniform size, two-hundredth of an inch in diameter.
14	6	90	Very fine yellow sand, of uniform size, two-hundredth of an inch in diameter.
15	1	91	Pipe-clay of yellowish-white colour.
16	10	101	Argillaceous grey and yellow sands.
17	1	102	Arenaceous clay of reddish-grey colour.
18	7	109	Yellow tenaceous clay, finely laminated.
19	29	138	Very tough red clay, laminated (? with subangular quartz pebbles).
20	1	139	Cream-coloured, impure pipe-clay. Brackish water, yielding 170 gallons an hour.
21	15	154	Very tough laminated red clay, with stones. When washed, colours water a bright brick-red, leaving a residue of brick-red sand, the grains mostly two-hundredth of an inch in diameter.

[Bore stopped.]

ABSTRACT OF PROCEEDINGS  
OF THE  
**Royal Society of South Australia,**  
FOR 1895-96.

ORDINARY MEETING, NOVEMBER 5, 1895.

WALTER HOWCHIN, F.G.S. (President), in the chair.

EXHIBITS.—W. HOWCHIN, F.G.S. exhibited a fragment of a fossil fish from the Eocene beds of the River Murray, near Morgan, collected by the Rev. W. L. Butler, of Renmark. The scales resembled those of a fossil species of *Pagrus* in the University Museum; also a stone marked with straight lines apparently for ceremonial purposes by the Aborigines. J. G. O. TEPPER, F.L.S., showed some fine specimens of *Myliitta australis* from the South-East, and some younger specimens from Mount Lofty. Also a woody fungus from Kangaroo Island. Also a case of Australian *Buprestide* of the genus *Stigmodera*. S. DIXON exhibited, with descriptive remarks, a large collection of auriferous and geological specimens from Coolgardie and Kalgoorlie, Western Australia. E. C. STIRLING, M.D., F.R.S., showed a large collection of ceremonial sticks and stones from the McDonnell Ranges, suggesting that they might have to do with marriage rites and food supplies. There were differences in their individual lines, but a general resemblance in the whole. The form of the animal represented by the totems was not approached in the markings.

PAPER.—“Natives of the Peake District,” by E. J. KEMPE.

ORDINARY MEETING, DECEMBER 3, 1895.

WALTER HOWCHIN, F.G.S. (President), in the chair.

EXHIBITS.—J. G. O. TEPPER, F.L.S., exhibited a case of *Lepidoptera*. Prof. TATE, F.G.S., laid on the table geological specimens from Victoria Land Antarctic Regions. S. J. SKIPPER exhibited a number of snakes caught by Mr. Willshire in the vicinity of Victoria River, Northern Territory, and presented to the South Australian Museum.

PAPERS.—“On the Origin of the Artesian Water Supply, Lake

Eyre Basin," by Prof. TATE, F.G.S. "Notes on a Bore at Enfield, near Adelaide," by W. HOWCHIN, F.G.S.

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ORDINARY MEETING, APRIL 14, 1896.

WALTER HOWCHIN, F.G.S. (President), in the chair.

EXHIBIT.—Prof. TATE, F.G.S., exhibited on behalf of THOS. SMEATON a specimen of *Helmintha echioides*, a European weed, now recognised for the first time in Australia.

BALLOT.—THOS. E. PARKER, C.E., was elected a fellow.

NOTICES.—Prof. TATE, F.G.S., drew attention of the Fellows and Members to the fact that a Memorial Fund was being raised to perpetuate the memory of the great scientific services rendered by Thomas H. Huxley, F.R.S. The Council of the Society had agreed to act as a General Committee, and E. C. Stirling, M.D., F.R.S., and Prof. R. Tate, F.G.S., F.L.S., as Hon. Secretaries.

W. HOWCHIN, F.G.S., reported that MAURICE HOLTZE, F.L.S., had been requested by the Council to act as its representative on the J. M. McDOWALL STEWART MEMORIAL COMMITTEE, the idea being to collect one shilling subscriptions for that purpose.

PAPERS.—"Eocene Strata near Bordertown," by E. V. CLARK. "*Microlepidoptera*," by J. JEFFREYS TURNER, M.D. "Contributions to *Coleoptera*," by Rev. THOMAS BLACKBURN, B.A.

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ORDINARY MEETING, MAY 5, 1896.

WALTER HOWCHIN, F.G.S. (President), in the chair.

EXHIBITS.—Prof. TATE, F.G.S., exhibited specimens and gave a technical description of a new species of land snail, *Glyptorhagada euglypta*, obtained by the Government Geologist, H. Y. L. BROWN, F.G.S., at Anabama, 75 miles North-East from Koorunga. The nearest ally is *G. Bordaënsis*, inhabiting near Cape Borda, Kangaroo Island, from which it differs by much larger size, relatively deeper, aperture different in outline, the spire slightly elevated, the costæ wider apart and serrated by spiral incisions, and the umbilicus smaller.

W. HOWCHIN, F.G.S., laid on the table a portion of the bore from Murray Flats, near Pine Hut Creek, about a quarter of a mile from the base of the hills. It consisted of earthy limestone carrying fossils of lower Eocene age. Depth 356 feet. J. G. O. Tepper, F.L.S., showed a case of rare and highly colored *Orthoptera*. When at rest they resemble in color their surroundings, in flight their gayer color is seen. MAURICE HOLTZE, F.L.S., exhibited a portion of a willow branch that had grafted itself by its apex into the stem.

BALLOT.—J. W. JONES, Conservator of Water, was elected a Fellow.

PAPERS.—“Correlation of the Marine Tertiaries of Australia, Part II,” by Prof. R. TATE, F.G.S., and JOHN DENNANT, F.G.S. “Description of New Land Snail, *Glyptorhagada euglypta*,” by Prof. TATE, F.G.S.

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#### ORDINARY MEETING, JUNE 2, 1896.

WALTER HOWCHIN, F.G.S. (President), in the chair.

EXHIBITS.—W. HOWCHIN, F.G.S., showed for Prof. R. TATE, F.G.S., specimens of *Apus Australiensis* (Spencer and Hall) taken from a lake at the Leviathan Battery, Kalgoorlie, W.A., by G. R. TATE. The species resembled *Lepidurus viridis* common in rain pools about Adelaide, but it belongs to a distinct genus which as far as known has only one species in Australia, which was figured and described in 1896 in the Zoology of the Horn Expedition. It had, however, been taken at Arkaringa Valley, S.A., by R. HELMS, of the Elder Exploring Expedition. R. JAGOE forwarded specimens of the moth and cocoon of *Antherea Roylei*, the produce of cocoons taken by some of Dr. Jamieson’s party from the Cape Colony.

BALLOT.—THOMAS J. GREENWAY was elected a Fellow.

PAPERS.—“Notes on a Genus of *Gryllide*,” by J. G. O. TEPPER, F.L.S. “New Australian Lepidoptera,” by OSWALD LOWER, F.Ent.S.

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#### ORDINARY MEETING, JULY 7, 1896.

WALTER HOWCHIN, F.G.S. (President), in the chair.

BALLOT—Dr. JAS. H. G. DRUMMOND, Dr. M. VON LUKOWITZ, and E. W. HAWKER were elected Fellows.

PAPER.—“The Artesian Water Supply, Lake Eyre Basin,” by J. W. JONES, Conservator of Water.

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#### ORDINARY MEETING, AUGUST 4, 1896.

WALTER HOWCHIN, F.G.S. (President), in the chair.

EXHIBITS.—J. G. O. TEPPER, F.L.S., exhibited a nest of *Palistes* of the family *Apidae* of a very large size, forwarded by Miss ELSIE ROBERTSON, from Chowilla, River Murray. E. C. STIRLING, M.D., F.R.S., and A. ZIETZ, F.L.S., laid on the table the fossil bones of *Genyornis Newtoni* and other fossils and recent struthious birds for comparison.

PAPER.—“Preliminary notes on *Genyornis Newtoni*,” a new

genus and species of Fossil Struthious Bird, found at Lake Callabonna, South Australia, by E. C. STIRLING, M.D., F.R.S., and A. ZIETZ, F.L.S.

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ANNUAL MEETING, OCTOBER 6, 1896.

WALTER HOWCHIN, F.G.S. (President), in the chair.

EXHIBITS.—J. G. O. TEPPER, F.L.S., exhibited a case of *Lepidoptera*, illustrative of the genera *Euphloea* and *Danais*, from Cachar, India, being part of the collection presented by ALLAN W. CHALMERS to the South Australian Museum. W. HOWCHIN, F.G.S., exhibited a block of silicified wood forwarded by C. H. HUSSEY, from a spot two miles from Port Elliot. It resembles the silicified wood from the Miocene beds at Gawler. He was not aware that these beds were represented near Port Elliot.

ANNUAL REPORT and BALANCE-SHEET were read and adopted.

ELECTION OF COUNCIL.—Walter Howchin, F.G.S., President; Prof. R. Tate, F.G.S.; and Rev. Thomas Blackburn, B.A., Vice-Presidents; Walter Rutt, C.E., Hon. Treasurer; W. L. Cleland, M.B., Hon. Secretary; Professor Rennie, D.Sc., E. C. Stirling, M.D., F.R.S., Maurice Holtze, F.L.S., S. Dixon, J. S. Lloyd, and W. H. Selway, Members of Council.

ELECTION OF AUDITOR.—D. J. Adcock was elected Auditor for 1896-97.

PAPERS.—“Descriptions of *Coleoptera*,” by Rev. THOMAS BLACKBURN, B.A.; “*Genyornis Newtoni*, Part II.,” by E. C. STIRLING, M.D., F.R.S., and A. H. C. ZIETZ, F.L.S.; and “Relation of Plants, Insects, and Birds to One Another,” by J. G. O. TEPPER, F.L.S.

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## ANNUAL REPORT.

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The Council has to report that the scientific work of the Society in publishing new and original matter relating to geology, entomology, mollusca, fossil birds, and Australian anthropology has been carried on successfully during the past year. The Council has also much pleasure in reporting that with the monetary assistance of Sir Thomas Elder, the printing and publishing of the third and final portion of the scientific results of the Elder Exploring Expedition has been brought to a satisfactory completion.

During the past year six new Fellows have been elected, three Fellows have resigned, and one Fellow has died. Although Mr. John Wilson, whose death the Council has the melancholy duty to record, never contributed any paper to the Society's Proceedings, yet by his staunch and loyal support of the Society during the past ten years contributed not a little to the successful carrying out of the expensive work which the publication of the Society's Proceedings entails. In this modest and retiring manner Mr. Wilson set an example to all his fellow-colonists who possess any interest in the recording of new scientific facts, which it would be much to the benefit of the Society if they would follow.

The membership of the Society consists of 11 Hon. Fellows, 75 Fellows, 16 Corresponding Members, and 2 Associates.

During the year the question of raising a fund to assist in erecting a suitable memorial to Prof. Huxley was brought before the Council, with the result of the Council forming itself into a Memorial Committee, with Dr. Stirling, C.M.G., F.R.S., and Prof. Tate, F.G.S., as Hon. Secs.

The Council was also represented on the John McDouall Stewart Memorial Committee by one of its members, Mr. M. Holtze, F.L.S., who kindly consented to act.

The President (Mr. W. Howchin, F.G.S.) has also had the arduous work of editing the Society's Proceedings for the current year (1895-96), owing to the necessity for Prof. Tate, F.G.S., paying a visit to Europe. Whilst the Council sympathises with the President on the additional and responsible work which has devolved upon him, yet at the same time it feels that much good will result to the Society from the fact that Prof. Tate will be brought into personal contact with some of the Hon. Fellows of the Society who reside in Europe, and who enjoy a world-wide reputation in their respective Branches of scientific work. The Council has already been advised of some of the results of this intercourse, which will lead to the publishing of valuable papers in the coming year's Proceedings.

THE TREASURER IN ACCOUNT WITH THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

DR.		CR.		£ s. d.		£ s. d.	
Oct. 1st, 1895.							
To Balance	...	...	76	3	0	...	65
“ Subscriptions—							18
Royal Society	...	...	69	0	0	...	3
Field Naturalists' Section	...	...	15	0	0	...	15
Malacological Section	...	...	2	10	0	...	0
							87
“ Grant from Government	...	...	86	10	0	...	14
“ Interest	...	...	81	6	3	...	2
							3
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							12
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							140
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							£246
							0
							10

Audited and found correct, October 6, 1896.

D. J. ADCOCK, Auditor.

WALTER RUTT, Treasurer.

## DONATIONS TO THE LIBRARY

For the Year 1895-6.

## TRANSACTIONS, JOURNALS, AND REPORTS.

*Presented by the respective Societies, Editors, and Governments.*

## AUSTRIA AND GERMANY.

- Berlin—Abhandlungen der Königlich Preussischen Meteorologischen Instituts. Ergebnisse der Beobachtungen an den Stationer II. and III., 1895 ; do., 1892.
- Zeitschrift der Gesellschaft für Erdkunde, band XXIX., No. 6 ; band XXX., Nos. 1, 2, 3, 4, 5.
- Verhandlungen Gesellschaft für Erdkunde, band XXI., Nos. 1 to 10 ; band XXII., Nos. 2 to 5, No. 10.
- Sitzungberichte Königlich Preussischen Akademie der Wissenschaften zu Berlin, Nos. 26 to 53, 1895 ; Nos. 1 to 39, 1896.
- Gottingen—Nachrichten von der K. Gesellschaft der Wissenschaften u. d. Georg-August. Universität, heft 3, 1895 ; heft 1, 2, 1896
- Halle—Leopoldina, heft 30.
- Nova Acta der K. Leopold-Carol. Deut. Akad. der Naturforscher, band LXIV., Nos. 1 and 2
- Friburg—Berichte der Naturforscher zu Friburg, band VIII., 1894 ; band IX., heft 1 to 3.
- Kiel—Schriften der Naturwissenschaftlichen Vereins für Schleswig-Holstein, band X., heft 1.
- Munich—Sitzungsberichte der Mathematisch-Physikalischen Classe der K. B. Akad. der Wissenschaften zu Munich, heft 2, 3, 1895 ; heft 1, 2, 1896.
- Vienna—Sitzungsberichte der Mathematisch-Naturwissenschaftlichen Classe Kaiserliche Akad. der Wissenschaften, Nos. X to XVIII.
- Verhandlungen der K. K. Geologischen Reichenstalt, Nos. 8, 9, 1895 ; Nos 1, 3, 1896.
- Kaiserliche Akad. der Wissenschaften in Wien, No. 1 to 18, 1896.
- K. K. Gradmessungs-Bureau Astronomische Arbeiten, band 7, 1895. Protocoll Commission, 1895.

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- Wurzburg—Sitzungsberichte der Physikalisch-Medicinischen Gesellschaft, Nos. 1 to 8, 1895.

#### AUSTRALIA AND NEW ZEALAND.

- Adelaide—Gov. Geologist.—Report on Northern Territory Explorations, 1895.
- Woods and Forests Department.—Annual Progress Report, 1894-95.
- Adelaide Observatory.—Reports 1891-93; Meteorological Observations, 1886-7.
- Australasian Association Advance. Science, vol. II., 1895.
- Brisbane—Department of Agriculture, Botany Bulletin, 12, 13.
- Royal Society of Queensland, vol. XI., part 2; Stratigraphical Notes on the Georgina Basin (Jack)
- Geological Survey Office, Annual Progress Report, 1894, 1895.
- Leichardt Gold Field and other Mining Centres in the Cloncurry District.
- Hobart—Royal Society of Tasmania, Papers and Proceedings, 1894, 1895.
- Melbourne—Victorian Naturalist, vol. XII., Nos. 6 to 12; vol. XIII., Nos. 1 to 6.
- Royal Society of Victoria, Transactions, vol. IV., 1895; Proceedings, vol. VIII., N.S.
- Department of Agriculture, Systematic Arrangement of Australian Fungi (McAlpine)
- Department of Mines and Water, Annual Report, 1895.
- Perth, W.A.—Mining Handbook, second edit., Gov. Geologist.
- Sydney—Australian Museum, Records, vol. II., No. 7; Report, 1895.
- Agricultural Gazette, vol. VI., pts. 9 to 12; vol. VII., pts. 1 to 9.
- Linnean Society, Proceedings, vol. X., pts. 2 to 4; supplement to vol. X.
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- Fossil Fishes of the Talbragon Beds (Woodward)
- Sydney Observatory, Results of Rain, River, and

Evaporation Observations made in N.S.W. during 1894; Icebergs in the Southern Ocean (H. C. Russell); Current Papers (H. C. Russell).

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#### BELGIUM.

Brussels—Annales de la Société Entomologique de Belge, tome 38, 1894.

————— Memoirs de la Société Royale des Sciences de Liege, tome XVIII., sec. series.

#### CANADA.

Halifax—Proceedings Nova Scotian Institute of Natural Sciences, vol. 13, part 4.

Montreal—Geological Survey of Canada, Maps of the Principal Auriferous Creeks in the Cariboo Mining District; Maps of S.W. Nova Scotia, Quebec, Ontario, Nova Scotia.

————— Canadian Record of Science, vol. VI., Nos. 3 to 8.

Ottawa—Geological Survey of Canada; Contributions to Canadian Palæontology, vol. II.; Palæozoic Fossils, vol. III., part 2.

Toronto—Canadian Institute Transactions, vol. IV., part 2.

#### FRANCE.

Caen—Bulletin de la Société Linnéenne de Normandie, vol. IX., series 4.

Lille—L'Institut Coloniale de Marseille, vol. III., part 2, 1895.

Marseilles—Faculté des Sciences de Marseille, Annales, tome IV., V., VI., VII.

Nantes—Bulletin de la Société Sciences Naturelles de l'Ouest de la France, tome IV., Nos. 2 to 4; tome V., Nos. 1 to 4; tome VI., No. 1.

Paris—Feuille des Jeunes Naturalistes, Nos. 300 to 311.

———— Bulletin des Seances Société Entomologique, Nos. 15 to 20, 1895; Nos. 1 to 12, 1896; Annales, Vol. LXIII.

———— Annuaire Géologique Universale, tome X., pp 655 to 900.

———— Bulletin de la Société de Géographie Commerciale de Paris, tome XVII., fasc. 4.

———— Bulletin du Museum d' Histoire Naturelle, Nos. 1 to 8, 1895; No. 1, 1896.

———— Annales de l' Institut Botanico-Geologique Coloniale de Marseille, vol. I, 1893.

———— Extrait des Memoires de la Société Zoologique de France, 1895

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## GREAT BRITAIN AND IRELAND.

- Belfast—Belfast Natural History and Philosophical Society, Report and Proceedings, 1894-5.
- Dublin—Royal Dublin Society, Proceedings, vol. VIII., pt. 3, 4; Transactions, vol. V., sec. series, Nos. 5 to 12; vol. VI., sec. series, No. 1.
- Royal Irish Academy, Proceedings, vol. III., third series, Nos. 4, 5; Todd Lecture Series, vol. VI.; Transactions, vol. XXX., parts 15 to 20.
- Edinburgh—Royal Physical Society, Proceedings, 1894-5.
- London—Royal Microscopical Journal, parts 5, 6, 1895; parts 1 to 4, 1896.
- Royal Society, Proceedings, vol. LVIII., Nos. 351, 352; vol. LIX., Nos. 353 to 358; vol. LX., No. 359.
- Linnean Society, Journal, vol. XXXI., Nos. 212 to 215; Proceedings, 1896.
- Royal Colonial Institute, Report of Proceedings, vols. XXVI., XXVII.
- Kew Royal Gardens, Bulletin, 1895.
- Entomological Society of London, Transactions, 1895.
- British Museum, Catalogue of Birds, vol. XXV.; vol. XXVII.
- Leeds—Journal of Conchology, vol VIII., Nos. 4 to 7.
- Manchester—Manchester Literary and Philosophical Society, Memoirs and Proceedings, vol. IX., Nos. 3 to 6; vol. X., Nos 1 to 3.
- Manchester Geographical Society, Journal, vol. X., Nos. 10 to 12.
- Manchester Field Naturalists and Archæologists Society, Report and Proceedings, 1895.
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- Madras—Madras Government Museum, Bulletin, No. 4.

## ITALY.

- Florence—Società Entomologica Italiana, Bulletin III. and IV.
- Milan—Atti Società Italiana Scienza Naturali Milano, vol. XXXVI., Nos. 1 to 14.
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- Pisa—Atti della Società Toscana de Scienza Naturali, vol. X.
- Turin—Bolletino dei Musei di Zoologia ed Anatomia Comparata dello R. Università di Torino, vol. X., Nos. 210 to 240.

## JAVA.

Batavia—Naturkundig Tidschrift, deel LV.; Supplementary Catalogues, 1883-1893; Boekwerken, 1895.

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- Tokio—Asiatic Society, Transactions, vol. XIII.; Supplement.  
 ——— College of Science, University of Japan, vol. VIII., part 2; vol. IX., part 1.  
 ——— Calendar, 1894-95.  
 ——— Tokio Geographical Society Journal, 1894.

## MEXICO.

- Mexico—Sociedad Científica, Memoirs, tome VIII., Nos. 1 to 4; tome IX., Nos. 1 to 8.  
 ——— Instituto Geológico, Bolletino, No. 3.

## NORWAY AND SWEDEN.

- Bergen—Bergens Museum, Aarbag, 1894-5.  
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 ——— Entomologisk Tidschrift, vols. 1880 to 1894; vol. 1895, hefte 1 to 4  
 Stavanger—Stavanger Museum, Aarsberetning, 1894.

## RUSSIA.

- Moscow—Société Impériale des Naturalistes, Bulletin, Nos. 2 to 4, 1895; No. 1., 1896.  
 St. Petersburg—Société Impériale Mineralogique, band XVII.  
 ——— Comité Géologique Bulletins, tome XIII., Nos. 8 to 9; tome XIX., Nos. 1 to 9, Supplement; tome XV., Nos. 1 to 2; Memoirs, vol. IX., No. 4; vol. X., Nos. 3 and 4; vol. XIII., No. 2; vol. XIV., No. 3.  
 ——— Académie Impériale des Sciences, Bulletins, tome II., No. 5., tome III., No. 1; Memoirs, tome XLII., No. 12.

## SWITZERLAND.

- Geneva—Société de Physique et d' Histoire Naturelle, Comptes Rendus des Séances, vol. XII., 1895.  
 Lausanne—Société Vaudoise des Sciences Naturelles, vol. XXXI., Nos. 118 to 119; vol. XXXII., No. 120.

## SOUTH AMERICA.

- Buenos Aires—Academia Nacional de Ciencias, Boletin, tome XIV., No. 2.  
 La Plata—Revista de la Facultad de Agronomía y Veterinaria Nos. 5 to 18.

Monte Video—Museo Nacional, *Annales* IV.

Rio de Janeiro—Observatoria, *Anuario*, 1895; *Le Climat de Rio de Janeiro*; *Determinatio das Posicoes Geographicas*; *Eclipses du Soleil et Occultations*.

#### SOUTH AFRICA.

Cape Town—Philosophical Society, vol. VIII., part 2.

#### UNITED STATES AMERICA.

Baltimore—John Hopkins University Studies, series XII., Nos. 8 to 12; series XIII., Nos. 1 to 8; *Circulars*, vol. XV., Nos. 121 to 126.

———— American Chemical Journal, vol. XVI., Nos. 7 to 8; vol. XVII., Nos. 1 to 7.

Boston—Society Natural History, *Proceedings*, vol. XXVI., part 4; *Memoirs*, vol. V., Nos. 1 to 2.

———— American Academy of Arts and Sciences, *Proceedings*, vol. XXI., 1894-5; Vol. XXII., 1894-5.

Cambridge—Harvard Museum Comparative Zoology, *Bulletin*, vol. XXVI., No. 1; vol. XXVII., Nos. 2 to 7; vol. XXIX., Nos. 1 to 6; *Report*, 1894-5.

———— *Psyche*, vol. VII., Nos. 233 to 244.

Cincinnati—Society of Natural History *Journal*, XVII., No. 4; vol. XVIII., Nos. 1 and 2.

Chicago—Field Columbian Museum, vol. I., No. 1; *Geological series*—No. 1, *Botanical series*; Nos. 1 and 2; *Zoological series*; No. 1, *Anthropological series*.

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———— (Albany)—New York State Museum, *Report*, 1893.

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- Sacramento—Californian State Mining Bureau Report, 1893.  
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#### FROM THE AUTHORS.

- Enzio Reuter—Ober die Palpen der Rhopaloceron.  
 D. Gill, L.L.D.—Report on the Geodetic Survey of South  
 Africa.  
 W. Horn—Report on the Work of the Horn Expedition to  
 Central Australia, parts I. to IV.



## LIST OF FELLOWS, MEMBERS, &amp;c.

NOVEMBER, 1896.

Those marked (F) were present at the first meeting when the Society was founded. Those marked (L) are Life Fellows. Those marked with an asterisk have contributed papers published in the Society's Transactions.

Any changes in the addresses should be notified to the Secretary.

Date of Election

## HONORARY FELLOWS.

1857. BARKELEY, SIR HENRY, K.C.M.G., K.C.B., F.R.S., Royal Colonial Institute, London.
1893. COSSMANN, M., Rue de Maubeuge, 95, Paris.
1876. ELLERY, R. L. J., F.R.S., F.R.A.S., Government Astronomer Victoria, The Observatory, Melbourne, Victoria.
1890. \*ETHERIDGE, ROBERT, Palæontologist to the Geological Survey of New South Wales, Sydney.
1853. GARRAN, A., L.L.D., Sydney, New South Wales.
1893. GREGORIO, MARQUIS DE, Palermo, Sicily.
1855. HULL, H. M., Hobart, Tasmania.
1878. JERVOIS, SIR W. F. D., K.C.M.G., C.B., F.R.S., Ex-Governor of South Australia, London, England.
1855. LITTLE, E.
1879. \*MUELLER, BARON F. VON, K.C.M.G., F.R.S., M. and Ph. D., F.G.S., F.R.G.S., F.C.S., C.M.Z.S., &c., &c., Government Botanist, Melbourne, Victoria. [Since deceased.]
1876. RUSSELL, H. C., B.A., F.R.S., F.R.A.S., Government Astronomer New South Wales, Sydney, New South Wales.
1894. \*WILSON, J. T., M.D., Professor of Anatomy, Sydney University.

## CORRESPONDING MEMBERS.

1881. BAILEY, F. M., F.L.S., Colonial Botanist, Brisbane, Queensland.
1881. \*CLOUD, T. C., F.C.S., Manager Wallaroo Smelting Works, South Australia.
1888. \*DENNANT, JOHN, F.G.S., F.C.S., Inspector of Schools, Russell-street, Camberwell, Melbourne, Victoria.
1880. \*FOELSCH, PAUL, Inspector of Police, Palmerston, Northern Territory, Australia.
1881. GOLDSTEIN, J. R. Y., Melbourne, Victoria.
1880. \*KEMPE, REV. J., Australia.
1893. \*MCKILLOP, REV. DAVID, S.J., Superior Daly River Mission, Northern Territory.
1892. \*MAIDEN, J. H., F.L.S., F.C.S., Botanic Gardens, Sydney, New South Wales.
1888. \*MASKELL, W. M., Wellington, New Zealand.
1886. NICOLAY, REV. C. G., Freemantle, Western Australia.
1880. \*RICHARDS, MRS. A., Georgetown, South Australia.
1892. \*SCHULZ, REV. LOUIS.
1883. \*STIRLING, JAMES, Assistant Geological Surveyor, Victoria.
1893. \*STRETTON, W. G., Palmerston, Northern Territory.

## FELLOWS.

1887. ADCOCK, D. J., Adelaide, South Australia.  
 1874. ANGAS, J. H., Adelaide, South Australia.  
 1895. ASHBY, EDWIN, Adelaide, South Australia.  
 1887. BAGOT, JOHN, Adelaide, South Australia.  
 1893. \*BEDNALL, W. T., Adelaide, South Australia,  
 \*BLACKBURN, REV. THOMAS, B.A., Woodville, South Australia.  
 1884. BOETTGER, OTTO, Adelaide, South Australia.  
 1886. \*BRAGG, W. H., M.A., Professor of Mathematics, University of  
 Adelaide, South Australia.  
 1882. BROWN, L. G., Adelaide, South Australia.  
 1883. \*BROWN, H. Y. L., F.G.S., Government Geologist South Australia,  
 Adelaide.  
 1893. BRUMMITT, ROBERT, M.R.C.S., England, Kooringa, South  
 Australia.  
 1884. BUSSELL, J. W., F.R.M.S., North Adelaide, South Australia.  
 1879. \*CLELAND, W. L., M.B., Ch.M., J.P., Colonial Surgeon, Resident  
 Medical Officer Parkside Lunatic Asylum, Lecturer on  
 Materia Medica University of Adelaide, Parkside, South  
 Australia.  
 1876. (L) COOKE, E., Commissioner of Audit South Australia, Adelaide,  
 South Australia.  
 1895. COOKE, JOHN H., Adelaide, South Australia.  
 1880. COX, W. C., Semaphore, South Australia.  
 1887. \*DIXON, SAMUEL, Adelaide, South Australia.  
 1876. DOBBIE, A. W., Adelaide, South Australia.  
 1896. DRUMMOND, J. H. G., M.D., Moonta.  
 1893. DUDLEY, U.  
 1890. \*EAST, J. J., F.G.S. (Corresponding Member, 1884.)  
 1871. ELDER, SIR THOMAS, G.C.M.G., Adelaide, South Australia.  
 1886. FLEMING, DAVID, Adelaide, South Australia.  
 1882. FOWLER, WILLIAM, Melton, Yorke's Peninsula, South Australia.  
 1889. FRASER, J. C., Adelaide, South Australia.  
 1880. \*GOYDER, GEORGE, JUN., F.C.S., Government Analyst South  
 Australia, Adelaide, South Australia.  
 1890. GREY, REV. WILLIAM, Mount Barker, South Australia.  
 1887. GRASBY, W. C., F.L.S., Adelaide, South Australia.  
 1896. GREENWAY, THOMAS J., East Adelaide.  
 1896. HAWKER, E. W., Adelaide.  
 1891. \*HOLTZE, MAURICE, F.L.S., Director Botanic Gardens, Adelaide  
 (Corresponding Member, 1882), Adelaide, South Australia.  
 1883. \*HOWCHIN, WALTER, F.G.S., Goodwood East, South Australia.  
 1893. JAMES, THOMAS, M.R.C.S., England, Moonta, South Australia.  
 1896. JONES, J. W., Conservator of Water, Adelaide.  
 1853. (F) KAY, ROBERT, General Director and Secretary South Australian  
 Public Library, Museum, &c., Adelaide, South Australia.  
 1894. KERSHAW, JAMES A., Entomologist National Museum, Melbourne.  
 1884. LENDON, A. A., M.D., M.R.C.S., Lecturer on Forensic Medicine  
 and on Chemical Medicine University of Adelaide, Honorary  
 Physician Children's Hospital, North Adelaide, Adelaide,  
 South Australia.  
 1866. LLOYD, J. S., Adelaide, South Australia.  
 1888. \*LOWER, O. B., F. Ent. S., Parkside, Unley, South Australia.  
 1885. \*LUCAS, R. B., Adelaide, South Australia.  
 1896. LUKOWITZ, M. VON, M.D., Adelaide.  
 1874. \*MAGAREY, HON. S. J., M.D., M.L.C., Adelaide, South Australia.  
 1874. MAYO, G. G., C.E., Adelaide, South Australia.

1882. \*MEYRICK, E. T., B.A., Ramsbury, Hungerford, Wiltshire, England.
1888. MOLINEUX, A., F.L.S., Secretary Central Agricultural Bureau South Australia, Kent Town, South Australia.
1859. (L)MURRAY, DAVID, Adelaide, South Australia.
1884. MUNTON, H. S., Brighton, South Australia.
1896. \*PARKER, THOMAS, C.E., Rockhampton, Queensland.
1893. PERKS, R. H., M.D., F.R.C.S., England, Birksgate, South Australia.
1883. PHILLIPS, W. H., Adelaide, South Australia.
1886. POOLE, W. B., Adelaide, South Australia.
1895. RAMAGE, REV. GRANVILLE, Norwood, South Australia.
1885. \*RENNIE, H. E., M.A., D.Sc., F.C.S., Professor of Chemistry University of Adelaide.
1891. ROGERS, R. S., M.D., Adelaide, South Australia.
1876. \*RUTT, WALTER, C.E., Adelaide, South Australia.
1891. SELWAY, W. H., JUN., Adelaide, South Australia.
1893. SIMSON, AUGUSTUS, Hobart, Tasmania.
1857. SMEATON, THOMAS D., Blakiston, Littlehampton, South Australia.
1871. SMITH, ROBERT BARR, Adelaide, South Australia.
1881. \*STIRLING, EDWARD C., C.M.G., M.A., M.D., F.R.S., F.R.C.S., Lecturer on Physiology University of Adelaide, Honorary Director South Australian Museum, Adelaide, South Australia.
1893. \*STREICH, VICTOR, F.G.S.
1876. \*TATE, RALPH, F.L.S., F.G.S., Professor of Natural Science University of Adelaide.
1886. \*TEPPER, J. G. O., F.L.S., Entomologist South Australian Museum (Corresponding Member, 1878), Adelaide, South Australia.
1894. \*TURNER, A. JIFFERIS, M.D., Brisbane.
1889. VARDON, JOSEPH, J.P., Adelaide, South Australia.
1878. \*VERCO, JOSEPH C., M.D., F.R.C.S., Lecturer on the Principles and Practice of Medicine and Therapeutics and on Clinical Medicine University of Adelaide, Adelaide, South Australia.
1883. WAINWRIGHT, E. H., B.Sc., St Peter's College, South Australia.
1878. WARE, W. L., Adelaide, South Australia.
1879. WAY, EDWARD W., M.B., M.R.C.S., Lecturer on Obstetrics and Diseases Peculiar to Women and Children University of Adelaide, Adelaide, South Australia.
1859. WAY, SAMUEL J., D.C.L., Chief Justice and Lieutenant-Governor South Australia, Adelaide, South Australia.
1882. \*WHITTELL, HORATIO, M.D., M.R.C.S., F.R.M.S., President Central Board of Health and City Coroner, Adelaide, South Australia.
1886. \*ZIETZ, A., F.L.S., Assistant Director South Australian Museum, Adelaide, South Australia.

## ASSOCIATE.

1895. CLELAND, JOHN B., Parkside, South Australia.

# APPENDIX.

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## FIELD NATURALISTS' SECTION

OF THE

# Royal Society of South Australia.

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### THIRTEENTH ANNUAL REPORT

OF THE COMMITTEE, BEING FOR THE YEAR ENDING SEPTEMBER  
30TH, 1896.

*Evening Meetings.*—Eight evening meetings have been held during the year, at which the attendance has again been well maintained, the number present being very even throughout the session. It is interesting to note that whereas in the early years of its existence the Section depended almost entirely on its elder members and outside help (such as University Professors and others) for members, &c., younger members are now coming forward for this purpose, with the result that the Section is becoming more self-reliant. The subjects dealt with have been varied and interesting—plants, birds, gold-crystals, and aquaria being some of the topics, while instructive addresses on the structure of feathers and of hair have also been contributed. Exhibits in natural history have formed a prominent feature at these meetings, and the “Question Box” has frequently been utilised as a means of eliciting information on various subjects. Owing to the holding, in October last year, of the Learned Societies' Conversazione, to which members of this Section contributed a large number of exhibits, no similar gathering was held by this Section during the year. Papers, &c., have been given by Dr. Perks, Miss E. F. Haycraft, B.Sc., Messrs. J. G. O. Tepper, F.L.S., T. D. Smeaton, E. Ashby, S. Smeaton, B.A., and W. H. Selway, jun.

*Excursions.*—Eleven excursions have been held, and the experiment has again been tried of continuing them through the winter months, when the seaside has usually been visited. These coastal trips have not been so much in favour as those to the

hills, some of the latter having been particularly well attended over 40 ladies and gentlemen journeying to the Happy Valley Waterworks and Clarendon. Many of the localities have been visited for the first time by the Section, those specially worthy of mention being the Sandy Creek Scrub and Barossa Goldfields (perhaps the most successful, botanically, during the year) and Echunga, when the gold-bearing features, as well as the plant-life of the locality, was examined. By way of variety, an excursion, chiefly devoted to the study of birds and their habits, was held, and proved very interesting.

*Protection of our Native Fauna and Flora.*—A separate report from the Committee appointed for this purpose is presented here with.

*McDonall Stuart Memorial Fund.*—This section appointed a representative on the Committee formed for establishing this fund, and members willingly contributed to the praiseworthy object sought to be carried out by this movement.

*Death of Mr. J. Wilson, F.E.I.S.*—During the year the Section recorded with regret the death of Mr. J. Wilson, F.E.I.S., who had been a member almost from its inception, and had filled the position of Vice-Chairman.

*Financial.*—The desire expressed by the parent Society at the beginning of the year for economy in working the Section has been duly regarded. The expenditure has been the smallest on record, and has been considerably exceeded by the amount received in subscriptions.

*Membership.*—There has been a satisfactory addition of new members to the roll during the year, which counterbalances the loss through resignation and other causes. The number now on the roll is 88.

ROBT. H. PERKS, Chairman.

W. H. SELWAY, JUN., Hon. Sec.

Adelaide, September 18, 1896.

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## EIGHTH ANNUAL REPORT OF THE NATIVE FAUNA AND FLORA PROTECTION COMMITTEE.

The Committee has met twice only during the past year. They sincerely regret that the state of Mr. Robin's health has not been such as to enable him to resume the position of Secretary.

*Kangaroos.*—The Committee having within the last week been informed that the term proclaimed for the protection of kangaroos in the Western District expired 22nd April last, has desired the Secretary to write to the Commissioner of Crown Lands suggesting that the term may be extended.

*Destruction of Native Birds' Eggs.*—A report has been received from the police stating that at both S. Peters and Norwood all eggs brought in as sparrows' eggs have been carefully examined by the Corporation Officer receiving them to ascertain that there are none of other birds among them.

*Shooting Protected Birds During Close Season.*—Complaints having been made last year that the reports of guns were frequently to be heard both in the district between Henley Beach and Glenelg, and in the Eastern Suburbs, the Secretary wrote to the Commissioner of Police on the subject. He obtained reports from Glenelg and Norwood that the constables could not obtain sufficient evidence to convict offenders. The Committee are, notwithstanding, aware that the provisions of the Game Act are being constantly broken, and regret that more active steps to prevent such breaches are not taken by the authorities.

*The Destruction of Seals.*—In their last report the Committee referred to the illegal capture of a seal at Port Vincent. By a letter from the Crown Lands Office, dated 26th September, 1895, they were informed that the seal in question had escaped, and by a subsequent letter that the police had been instructed to strictly enforce the observance of the close season for seals.

*The Cape Borda Lighthouse Reserve.*—The Committee of the Australasian Association for the Advancement of Science having recommended that this reserve should be dedicated to the preservation of the native fauna, the Secretary wrote to the Commissioner of Crown Lands asking what steps had been taken to carry out this recommendation, and received in reply an intimation that the Marine Board had enquired into the matter, and had carried the following resolution :—"The reserve in question being required as providing a fresh food supply for the Lighthouse-keepers, the Board cannot agree to the suggested dedication."

Again the thanks of the Committee are due to the Commissioner of Crown Lands for the distribution of notices regarding the close seasons for birds and animals.

SAMUEL DIXON, Chairman.  
M. SYMONDS CLARK, Hon. Sec.

September 18, 1896.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

RECEIPTS AND DISBURSEMENTS FOR THE YEAR 1895-6.

DR.	RECEIPTS.	£ s. d.	CR.	DISBURSEMENTS.	£ s. d.	£ s. d.
To	Balance brought forward	... ..			... ..	3 16 3
"	Grant from Royal Society	... ..		By Postage and Sundries	... ..	2 8 0
"	Subscriptions	... ..		" Printing	... ..	1 0 0
		... ..		" Attendance	... ..	
		... ..				7 4 3
				" Subscriptions, as per contra, paid over to		
				Royal Society	... ..	15 0 0
				" Balance in hand	... ..	3 10 2
						£25 14 5

Audited and found correct,

THOS. EVANS, F.S.A.I.A., }  
 THOS. FABIAN, } Auditors.

Adelaide, 21st September, 1896.

W. H. SELWAY, JUN.,  
 Hon. Secretary and Treasurer.



# ASTRONOMICAL SECTION

## OF THE

# Royal Society of South Australia.

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### FOURTH ANNUAL REPORT.

In submitting their fourth annual report the Committee are pleased to note signs of the steadily growing interest in those subjects which this society seeks to popularise.

There have been five general meetings of the society during the past year, and five business meetings of the Committee.

The membership numbers forty-five, having gained four and lost two since last annual meeting.

Papers on the following subjects have been read and discussed:—

Computations of time, by Miss A. M. M. Todd.

The effect of the Tides on the Rotation of the Earth, by C. C. Farr, B.Sc.

Hypothesis to Account for Gravitation, by C. C. Farr, B. Sc.

The Theory of the Tides, by R. W. Chapman, M.A.

Jupiter, by E. P. Sells.

Symbols for the Signs of the Zodiac, by Sir C. Todd, K.C.M.G.

Besides the papers the Question Box has provided interesting matter, both for research and discussion.

The Monthly Notes (now in their fifth year) have maintained their character for excellence and have been distributed at the beginning of every month. The thanks of the society are due to the proprietors of the *Register* for publishing the Notes in their paper, thereby increasing the number of those who may be benefited by them, thus furthering the objects of the society.

Members have been supplied with printed copies of the Rules.

The part taken by the Astronomical Section in the conversatione tendered to His Excellency the Governor last November proved a success, and its best thanks are due to the President and those members who contributed towards that end.

Adopted at annual meeting held at the Adelaide Observatory on the 15th September, 1896.

The following officers were elected for the ensuing year:—Sir C. Todd, K.C.M.G., President; Messrs. Lee and Dobbie, Vice-Presidents; Messrs. Strawbridge, Harris, Kestle, and Griffiths, Committee; and W. E. Cheesman, Honorary Secretary.

C. TODD, President.

W. E. CHEESMAN. Hon. Secretary.

ASTRONOMICAL SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

BALANCE SHEET FOR 1895-6.

	£	s.	d.		£	s.	d.
DR.				CR.			
1895.				By Printing Monthly Notes ...	...	...	...
To Balance	...	12	17 7	“ Postage	...	...	2 8 0
“ Subscriptions received	...	9	15 0	“ Stationery	...	...	2 10 0
“ Interest	...	0	8 4	“ Advertisement	...	...	0 18 0
				“ Notes Album	...	...	0 3 6
				“ Printing Rules	...	...	0 15 6
				1896.			1 0 0
				“ Balance	...	...	15 5 11
							£23 0 11

Audited and found correct, Sept. 13, 1896.

RICHARD T. GRIFFITHS, Auditor.

W. E. CHEESMAN,  
Secretary and Treasurer.

Read and adopted, September 15, 1896.

C. TODD, President.

## MALACOLOGICAL SECTION

OF THE

## Royal Society of South Australia.

## SECOND ANNUAL REPORT.

The section has concluded its work of a critical revision of the Marine Gastropods of South Australia, and have dealt with the following families:—Marginellidæ, Olividæ, Conidæ, Pleurotomidæ, Cancellariidæ, Cypræidæ, and Cassidæ.

The lists of local representations of these families have been considerably increased by the addition of many new species (obtained chiefly through the dredging operations of Dr. Verco), and many forms not hitherto recorded as occurring have been duly localised and identified. Of the former, new species to the number of sixteen belonging to the Pleurotomidæ have been described by Mr. J. B. Sowerby, from type specimens forwarded to him, in a paper in proceedings of the Malacological Society (Vol. II., Part I., April, 1896), and of the other, several have been dealt with by their discoverer, Dr. Verco, in a paper published in this volume of the transactions of the Royal Society of South Australia.

Ten meetings have been held during the year. Dr. R. H. Perks was elected Hon. Secretary and Treasurer vice Mr. R. H. Pülleine, the latter having left Adelaide for residence in Sydney, New South Wales.

Two new members have been elected during the year, Dr. Torr and Mr. Ashby.

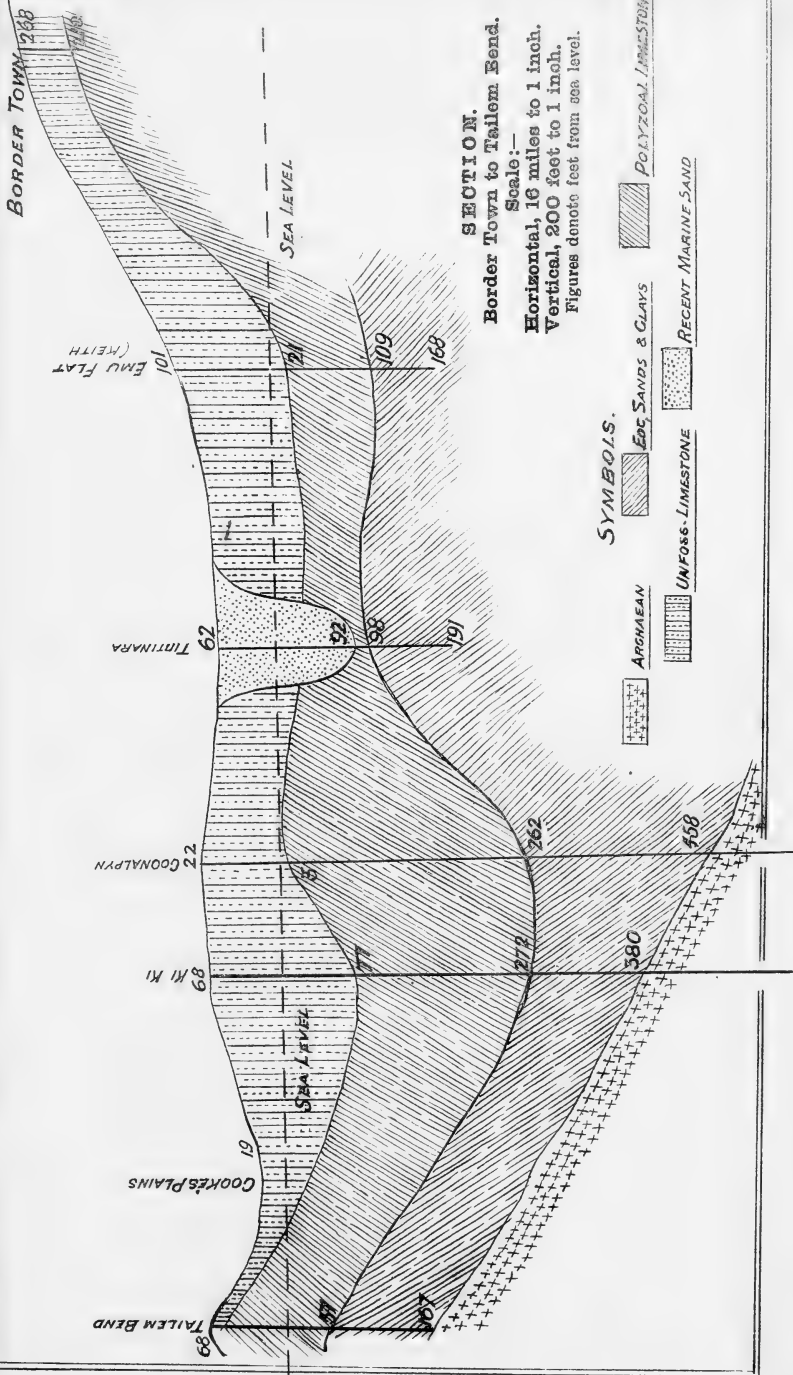


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 Zietz, A. H. C., on a New Fossil Struthious Bird, 171, 191.



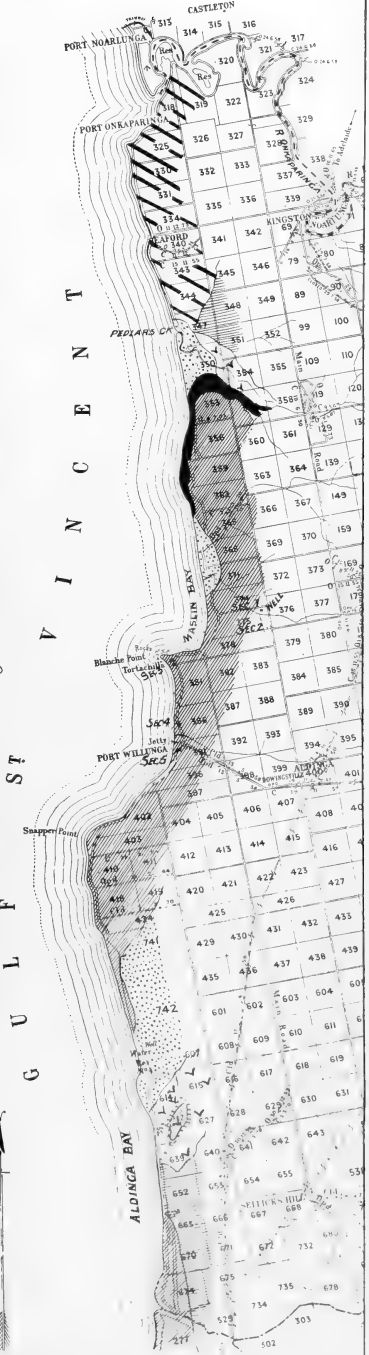
**SECTION.**  
**Border Town to Tallam Bend.**  
 Scale:—  
 Horizontal, 16 miles to 1 inch.  
 Vertical, 200 feet to 1 inch.  
 Figures denote feet from sea level.





V I N C E N T

- INDEX TO SIGNS
- Archaeum
- Grits, rotten slates and ferric Oxide in bands.
- Older Tertiary.
- Drifts.
- Blown sand.
- Alluvium.



G U L F S T

ALDINGA BAY

PORT NOARLUNGA

PORT ONKAPARINGA

LAFFORD

PEDIARS CR

MASLIN BAY

Blanche Point

Tortachilla

Jetty

PORT WILLUNGA

Snapper Point

WATER

WELL

CASTLETON

313

314 315 316

317 318 319 320 321 322 323 324

325 326 327 328 329

330 331 332 333 334 335 336 337 338 339

340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401

402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500

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601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700

701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742

743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900

901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000



FIG. 1. - 1.



FIG. 2. - 2.



FIG. 3. - 3.

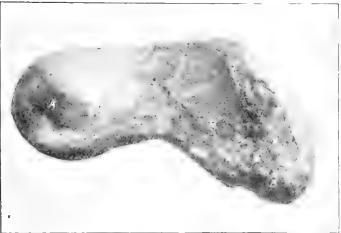


FIG. 4. - 4.

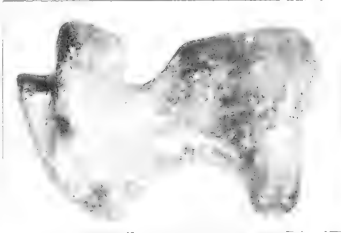








FIG. 2. - 3.



FIG. 5.

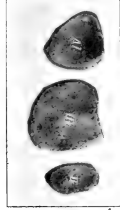


FIG. 6.



FIG. 1. - 4.



FIG. 3.

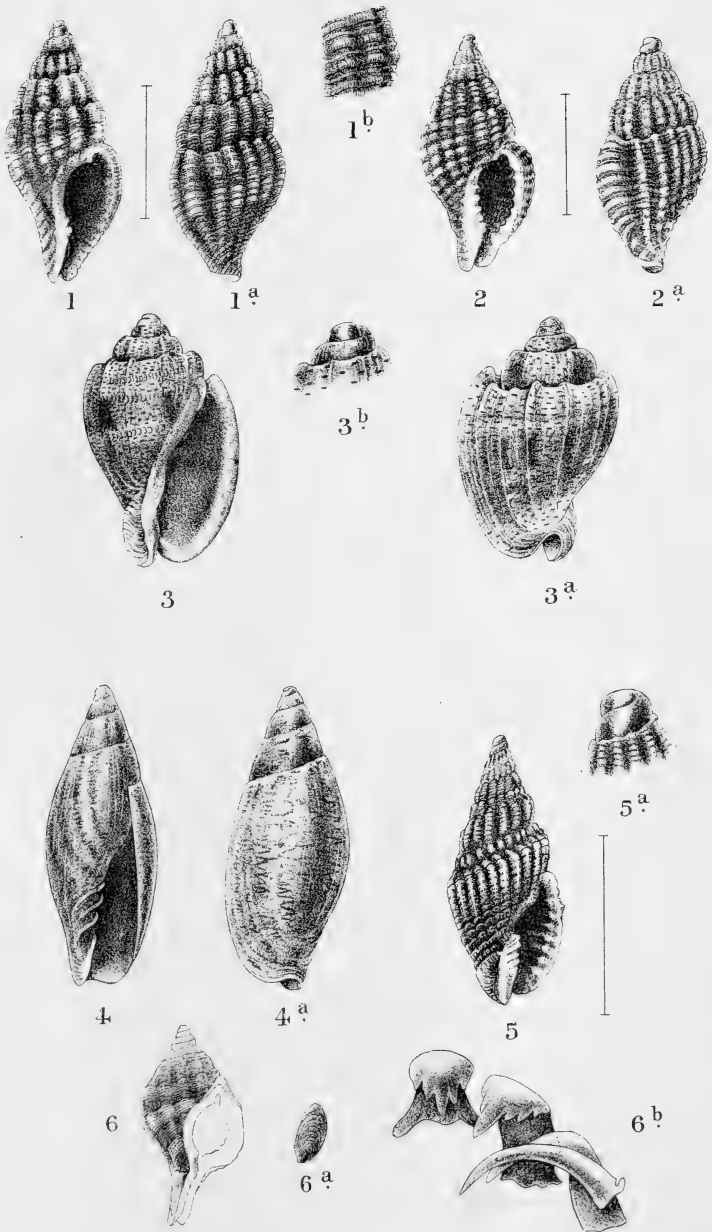


FIG. 4.









H.B. lith.





1



1<sup>a</sup>



1<sup>b</sup>



2

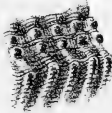


2<sup>a</sup>



3

3<sup>b</sup>



3<sup>c</sup>



3<sup>a</sup>



4

4<sup>b</sup>

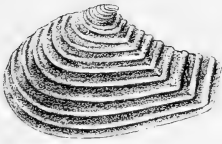


4<sup>c</sup>

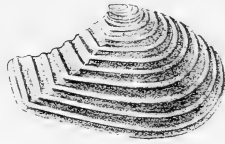


4<sup>a</sup>



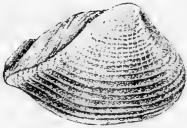
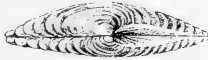


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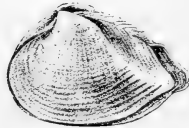


1<sup>a</sup>

1<sup>b</sup>



2



2<sup>a</sup>



2<sup>b</sup>



3



4



4<sup>b</sup>



4<sup>a</sup>



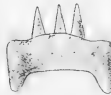
6<sup>a</sup>



5



5<sup>a</sup>



6



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7256

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[WITH TWO PLATES.]

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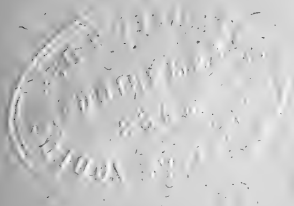
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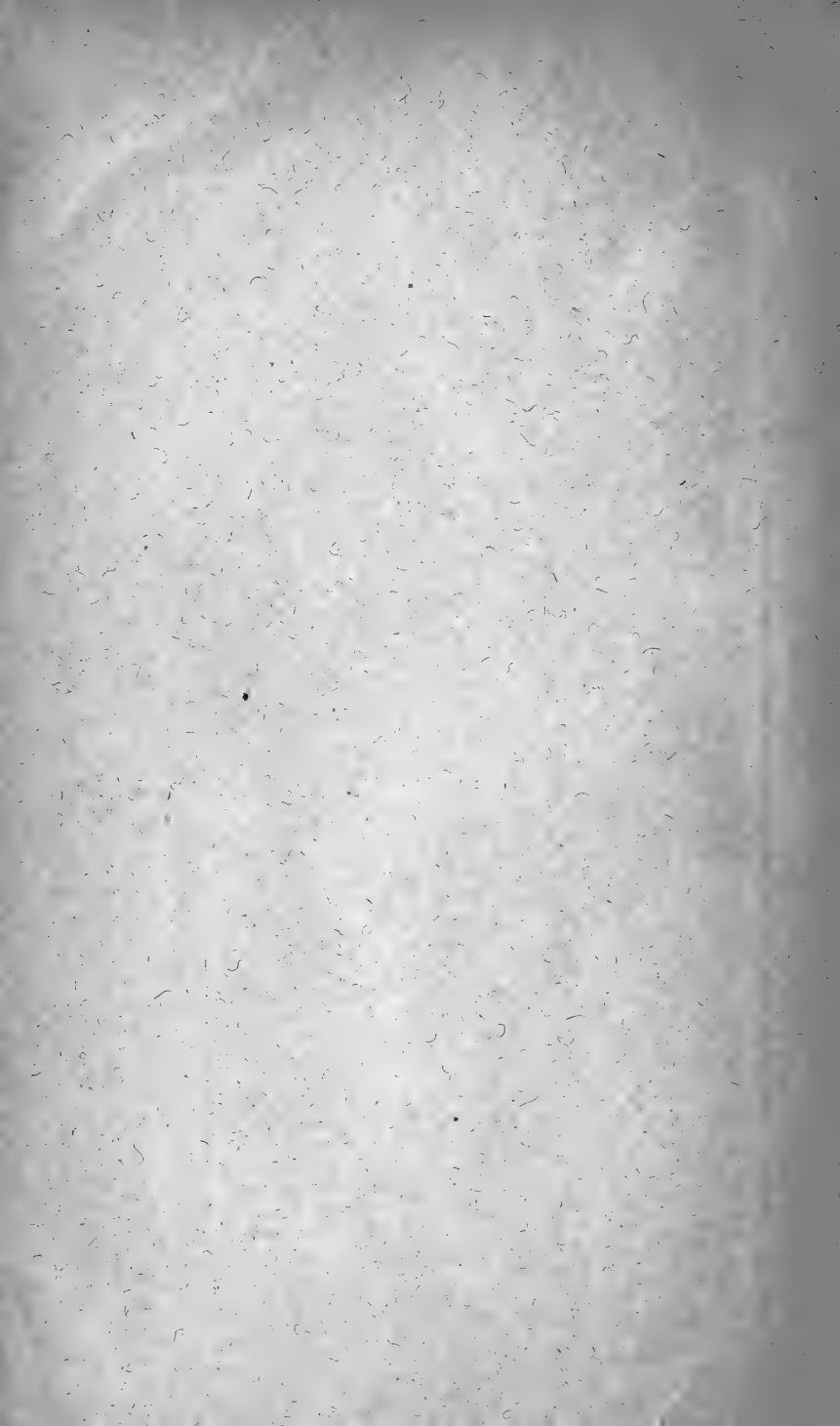
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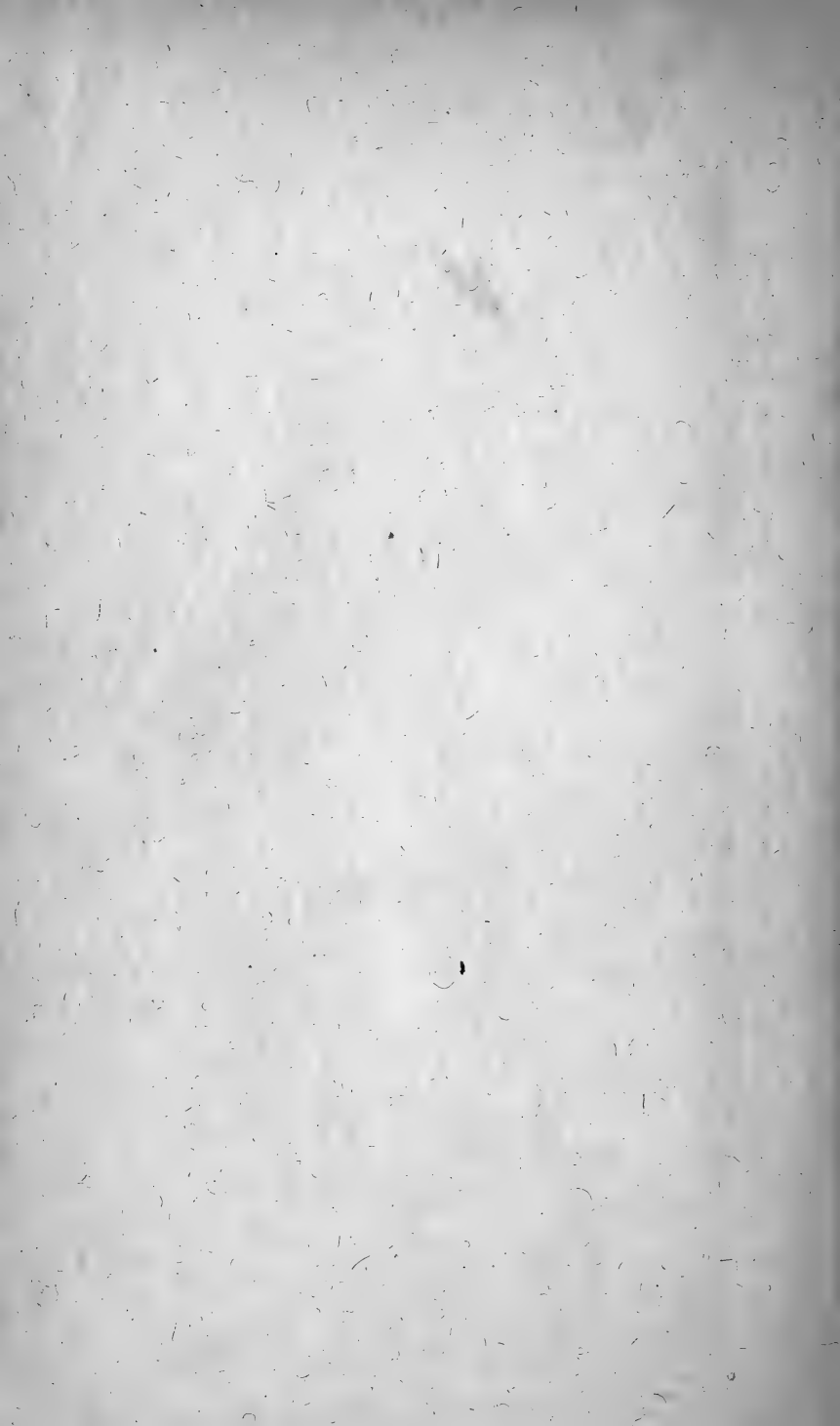
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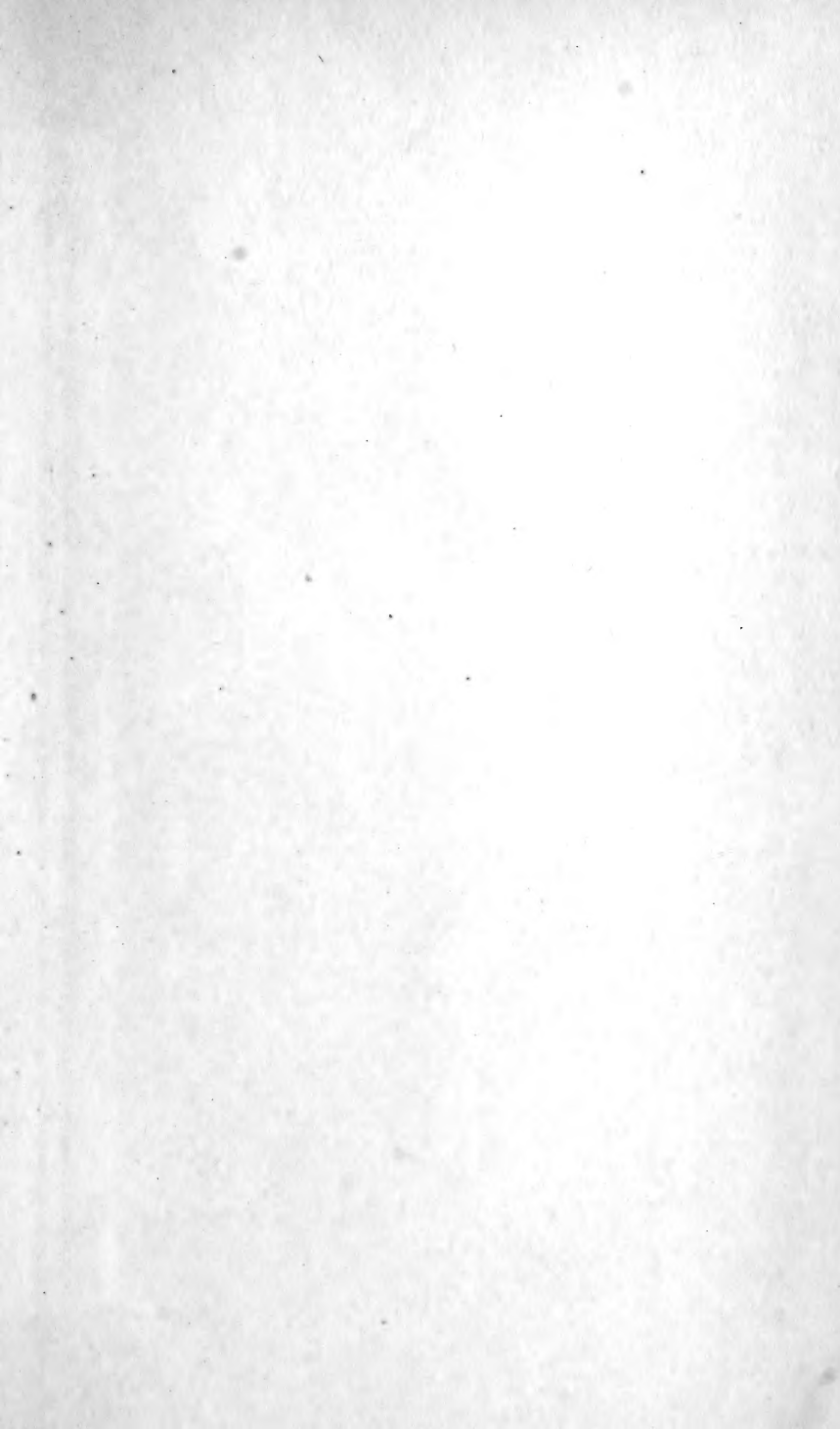
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