

MEMOIRS OF THE
QUEENSLAND
MUSEUM *

VOL. I.

BRISBANE:
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EDITED BY THE DIRECTOR,
R. HAMLYN-HARRIS, D.Sc., F.L.S., F.R.M.S., F.Z.S., &c.



FRONTISPIECE.

THE QUEENSLAND MUSEUM, BRISBANE.



QUEENSLAND
MUSEUM,
BRISBANE.

Family PTILONORHYNCHIDÆ.

Prionodura newtoniana, De Vis.
THE GOLDEN BOWER-BIRD.

AMONG the many unique features Australia presents to the naturalist, a prominent place must be given to the bower-building habits of the Ptilonorhynchidæ. These bowers, or, to use Gould's term, theatres, must not be confounded with the nests, which are built in the usual way. They are assembly grounds, in which the birds meet to display their amatory and decorative instincts. The remarkable bower here displayed was found in the Atherton Scrub, and secured in its natural state. The actual work of the birds is thus shown. Overhead, a tangle of creepers made an appropriate canopy. The Golden Bower-bird decorates its theatre with flowers, leaves, and moss. In this case the birds have made use of the white fruit of a species of *Evodia*.

ONE OF A SERIES OF LABELS ON THE BOWER BIRDS OF AUSTRALIA.
(Two-thirds Natural Size.)



BOWER OR THEATREION OF *Prionodura newtoniana* De Vis.
The Golden Bower Bird.

From the Atherton Scrub, North Queensland.
Recently mounted in the Bird Gallery.

Face page 1A.



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Editor:—R. HAMLYN-HARRIS, D.Sc., F.L.S., F.R.M.S., F.Z.S., F.E.S., &c.,
DIRECTOR.

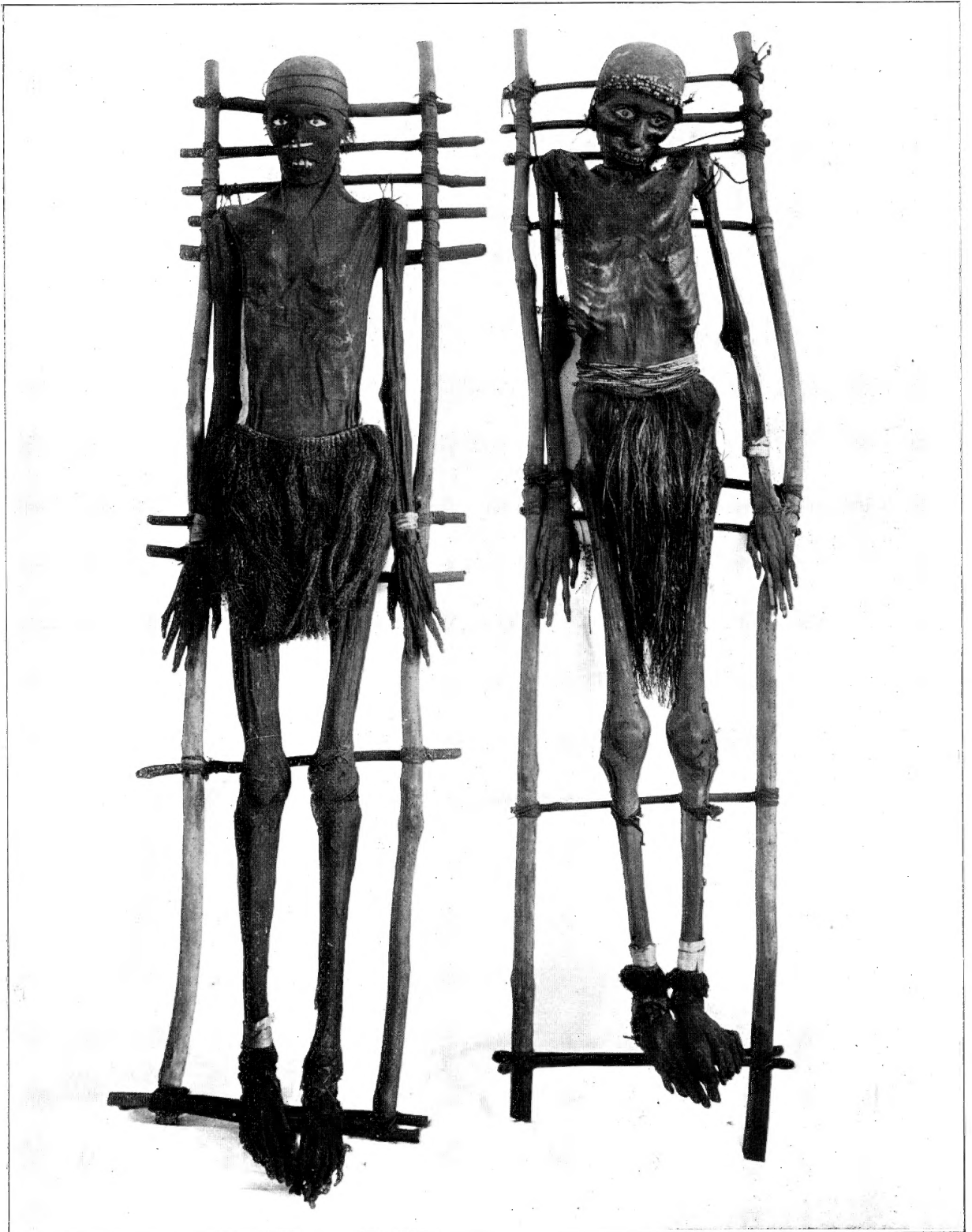


FIG. A.—FEMALE.

FIG. B.—MALE.

PAPUAN MUMMIES FROM STEPHENS ISLAND.

Q. M. Specimen No. E. 12/102.

PAPUAN MUMMIFICATION.

As practised in the Torres Strait Islands, and exemplified by specimens in the Queensland Museum collections.

By R. HAMLYN-HARRIS, D.Sc., F.L.S., ETC. (DIRECTOR).

(Plates 2 and 3.)

THERE are in the possession of the Queensland Museum two Torres Strait mummies deputed to have been brought from Stephen Island by the late Mr. W. F. Petterd, of Launceston, Tasmania, and donated by Sir A. H. Palmer, K.C.M.G., then Acting Governor of Queensland. The only reference to these two specimens seems to be in Edge-Partington and Heape's *Ethnographical Album* ⁽¹⁾, in which their country of origin is said to be Murray Island. So much interest has been attached to these mummies that I have been endeavouring to ascertain something of their origin and mode of preservation. Very little seems to be known of them except by a few persons intimately connected with the islands, and even then it is difficult to get those who are in possession of the facts to take the trouble to relate them for purposes of handing down to perpetuity customs which are rapidly dying out. Sir William Flower ⁽²⁾, in 1879, published an interesting account of the mode of preserving the dead in Darnley Island, and in the same volume reproduces a photograph of a specimen which was at that time in the possession of the Museum of the Royal College of Surgeons, and which is again reproduced by D'Albertis ⁽³⁾ in his book on New Guinea.

To Mr. J. S. Bruce, who has been for many years a resident on Murray Island, I am indebted for the information from which the following notes have been compiled. Although the process is said to have been practised on all the islands of the Strait, these remarks apply particularly to the customs at one time in vogue on Murray, Stephen, and Darnley Islands.

⁽¹⁾ EDGE-PARTINGTON.

Ethnographical Album of the Pacific Islands, third series, August, 1898, page 94.

⁽²⁾ WILLIAM HENRY FLOWER.

Illustrations of the Mode of Preserving the Dead in Darnley Island, &c.
Journal of the Anthropological Institute of Great Britain and Ireland, London, vol. 8, 1879, page 389.

⁽³⁾ L. M. D'ALBERTIS.

New Guinea (2 vols.), London, 1880, vol. i., page 240.

DEATH WAIL.

Immediately after death and when the first death wail was finished, the body was laid out on a mat on the ground in front of the house where the person died. If it was a male there was no covering on the body, but females were clothed with a grass petticoat from the waist to the knees. Soon the relatives and other mourners began to assemble. If the death took place in the daytime they kept up a subdued wailing and crying until sundown, when the old men sat down in a circle round the body and began to sing the death chant, accompanying themselves by beating on their drums. When they were finished, the relatives and mourners, who sat in an outer circle, began the wailing (*E bazoli*). The two parties kept on alternately with chant and wail until break of day, when green cocoanuts were distributed amongst the mourners, a sign that the wailing was finished.

TERER AND AUKEM.

About an hour after sunrise the ceremony of carrying away the spirit of the deceased to the Island of Boigo was enacted by two men, one of whom was dressed with a petticoat made of the young fronds of the cocoanut-palm. A light mask covered his features, and he was supposed to belong to the spirit world. In one hand he carried a bow and arrows; in the other a large rattle (*Goa*) made of dried nut shells. He appeared in the east, and postured and danced along the beach towards the west, accompanied by the singing and drum-tapping of the old men. When he passed by where the body lay a great wail was given by the mourners, as the spirit of the deceased was supposed to be then taken away from the body. The other actor was dressed to represent an old woman who hobbled after her son. The spirit carrier always postured towards the west until he arrived at a convenient spot out of sight of the mourners; then both retired into the bush, divested themselves of their trappings, and returned to mix with the others.

BODY PLACED ON PLATFORM.

After Terer and Aukem had passed off with the spirit, the body was removed by the relatives to a cleared space in the bush at the rear of the residence and placed on a bamboo platform (*paier*) about 8 feet high. A fence of dried cocoanut leaves was erected around it to act as a screen from observation. A fire was made on the ground to one side of the platform and was kept alight night and day whilst the body remained there. This fire was not for the purpose of drying the body, but it was considered that, as people enjoyed the convenience of a fire when alive, it was proper to give them the same comfort

in death. Probably another use of the fire was to assist in killing the noxious fumes from the decomposing body. There were generally six attendants (relatives) appointed whose duties were to watch the body, keep the fires alight, and prepare the body for mummifying. If the deceased was a male, the attendants were all males; if a female, one-half were females.

BODY TAKEN TO THE SEA FOR PREPARATION.

A ladder was placed for the attendants to mount on to the platform to view the body where it lay four or five days to decompose. When it was considered to be ready for operating on, it was placed upon the piece of an old canoe with a hollow on the bottom and carried down to the sea. The outer skin (epidermis) was then scraped and peeled off, an incision was made with a shell in the side, and all the entrails were removed, also the testicles. The eyes were also pierced to let the liquids drip out. None of the internals were kept; they were allowed to float away with the tide. For preservation, the tongue was cut out by the root. An incision was also made round each wrist, and round each finger and nail of the hands. Then the palms of the hands with finger-nails attached were pulled off; the same was done with the soles of the feet with toe-nails attached. These were dried and worn by the widow suspended from her neck. After the body was thoroughly cleansed in the sea, it was removed to the beach and placed in a sitting posture; a cut was made at the base of the skull behind, a piece of broken arrow was inserted, and the brain removed by screwing the arrow around.

The body was then stretched out at full length on the beach and pieces of dried sago-palm (which float to these islands from New Guinea) about 1 inch in diameter were placed inside the cavity of the body in positions to support it from contracting too much in the drying process. One long piece rested on the pelvis and extended to the breast-bone as a principal support; other pieces were placed in positions where it was considered necessary. When these were all placed, the cut in the side was sewn up with fine sennet, and the body was smeared all over with red ochre mixed with cocoanut oil. Cuts were made on the kneecaps and between the fingers and toes; then holes were pierced in the cuts with an arrow so as to allow the liquids to drip from them. The body was then laid out on a wooden or bamboo frame with two bars for the feet to rest upon, and other bars were fastened across the frame where the body was fixed to them with loops of sennet at the knees, hands, and shoulders; a broad plaited band passed round the forehead. The head was supported by a pin of wood, which was placed under the chin and rested on the breast-bone.

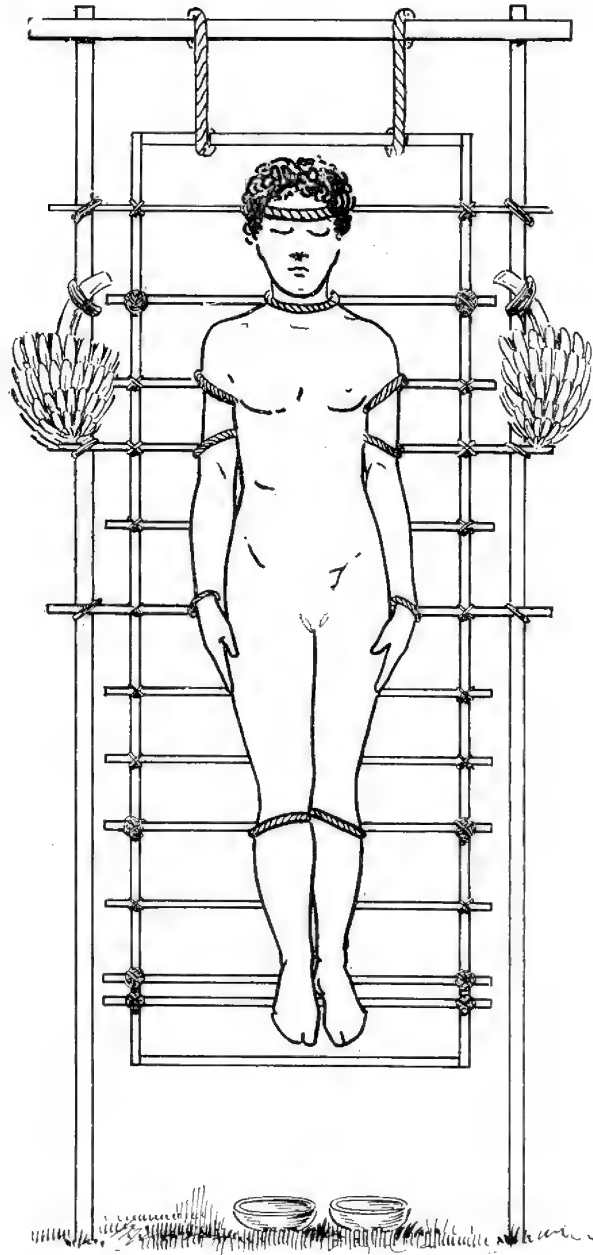
BODY HUNG UP TO DRY.

This frame, with the body on it, was then taken to where the platform had been removed, and hung up on a gallows, about 12 or 14 feet high, with ropes. Some of the cross-bars extended to the gallows, where they were tied to keep the body from swinging in the wind (*see* sketch). There was no screen round the gallows, it being open for anyone to view, but no one except the attendants were allowed near until the drying of the body was completed. A bunch of bananas was hung up on each side of the body, and renewed as they rotted off. A ladder was fixed up for the attendants to reach up as high as the head of the body. Twice a day they squeezed and rubbed with their hands the body downwards from the face to the feet. Two large shells were placed on the ground to receive the juices which dripped from the body. Plate 3.

DECORATING THE MUMMY.

When the body was nearly but not quite dried, it was taken down from the gallows to be decorated. Pieces of nautilus shell were placed in the eye-sockets to represent eyes. The body was all smeared again with ochre and cocoanut-oil. The ears where they were pierced were decorated with tufts of coloured grasses and coloured seeds. The nose-stick (Kirkub) was placed in position. Band of plaited sennet (Mat lager) were put round forehead and a white feather on each side of the head to represent a head-dress for dancing (Dari). A shell dance ornament (Eb neub) was hung in front of the penis. Pearlshell ornament, crescent-shaped (Mai), hung from the neck and rested on breast. The ankle and wrist ornaments (Put) used were made from the young fronds of the cocoanut palm.

After decorating the body, it was again hung up on the gallows to complete the drying process. When it was considered to be thoroughly dried a big feast was held, and the widow was presented with the dried tongue, palms of the hands, and soles of the feet, which she wore suspended from her neck along with her other mourning trappings. The mummified body was placed inside the bee-hive dwelling-house and fastened to the centre post. After a few years the head began to get loose and shaky; when the relatives would decide it was time to remove it from the house, the head was taken off, placed in a particular basket (Ka), and presented to the widow to take care of. The mummified body was then taken to one of the deceased's gardens and placed on a bamboo platform and left there to decay away.



MUMMY ON THE "GALLOWS" DURING THE PROCESS
OF DESICCATION, ETC.



FEMALE MUMMY'S DRESS.

In preparing the body of a female for mummification, females dressed the lower parts of the body and prepared suitable coverings for these parts. When the body was placed on the first platform, the petticoat was removed and one made of shredded leaves of a vine called Poar was placed in front, covering from the waist to the knees. When the body was hung up on the frame to dry, an apron made of shredded banana leaves was worn in front, and a small mat made from plaited pandanus leaves worn behind. The tongue was not cut out, neither were the palms of the hands or soles of the feet stripped off. The attendants, both male and female, who prepared the bodies kept their heads wrapped up with banana leaves to protect their hair from the fumes from the time they began work until they were finished. Their food was supplied to them strung on to arrows, so that they would not require to touch the food with their hands; they gnawed it off the arrows, holding one in each hand. The bodies of very old people were not mummified; others were, if their friends felt inclined to go to the trouble, or according to the season of the year, as many feasts were held and it required a season of plenty to supply the food.

FINAL DISPOSITION OF THE BODY.

Some bodies were buried close to the dwelling-house, and if the head was wanted for preservation a piece of sennet was inserted in an incision made under the skin and passed through the nose. This noose was firmly tied, and the end of the line was fastened to a stake driven into the ground. When the body was considered to be ripe enough, the head was jerked off by this line, dried and decorated, and then placed inside the house. Some bodies that were not wanted for mummifying were taken to one of the deceased's gardens, placed on a bamboo platform, and left there to decay. These gardens were put out of cultivation for a few years. Others were buried inside of dwelling-houses, and in these cases the houses were generally deserted and allowed to fall into decay. The platform and gallows where bodies were placed were always placed high enough to prevent dogs from attacking the body. There was one sept of native ghouls who were allowed to eat portions of the decomposed and dried bodies, also to drink the juices which dripped into the shells placed underneath. They had, in addition, the privilege of eating bananas that were hung up on each side of the body on the gallows.

THE QUEENSLAND MUSEUM MUMMIES.

Measure 5 ft. 4 in. (male) and 5 ft. 5½ in. (female) respectively, and on the whole are in a good state of preservation. Except in one particular, the foregoing remarks apply so closely to these specimens that further comment on my part would be unnecessary. The bodies show clearly that no incision was made in

the sides to extract the viscera. Sir William Flower remarks that the specimen in the Museum of the Royal College of Surgeons was opened on the right flank, longitudinally at a spot between the last rib and the crest of the ileum, and was closed again by seven separate ligatures. I have examined our specimens with great care and can find no such incision nor any sign of so delicate an operation having been performed, the viscera evidently having been removed from an opening created by the removal of the anus and its attendant parts. That this should have been the case, in view of what Sir William Flower tells us, is the more astonishing since customs of this kind are as a rule so deeply rooted that natives seldom depart from them, and yet under the circumstances the method evidently adopted in the Queensland Museum specimens would seem to be the most practical from a utilitarian standpoint, especially in view of the fact that a fairly large piece of wood had been inserted into the body cavity according to custom.

There is a specimen of a similar nature in the Macleay Museum, Sydney, but although I have seen it I regret I have not had an opportunity of examining it.

MUMMIFICATION,

And other similar customs as practised by the Queensland Aborigines, and exemplified by specimens in the Queensland Museum collections.

BY R. HAMLYN-HARRIS, D.Sc., ETC. (DIRECTOR).

(Plates 4-11.)

THE methods practised by the aboriginal inhabitants of Queensland in the matter of the disposal of their dead are extremely varied, gruesome, and revolting, and only a few scientific workers have made a real study of them. A great many disjointed accounts of interment and customs appertaining to the disposal of the dead have from time to time been published, but it is questionable whether reliance can be placed upon them, since the native is at all times very reticent and regards the interference of the white races with disfavour and distrust. We are, however, indebted to Dr. Roth ⁽¹⁾ for a valuable contribution dealing with Queensland customs in particular.

The Queensland Museum collections contain a fairly representative number of specimens which lend colour and confirmation to the writings of previous ethnologists. It is my intention strictly to avoid any vain repetition: the illustrations will speak for themselves. The object of this short paper is not so much to add anything new, as to place on record the various kinds of material which have from time to time come into our possession. Experience has taught us that with the very primitive races there is a considerable elasticity in native methods, and although the practices in the main are the same, they vary in detail. With wandering races such as ours, this elasticity doubtless is due to local conditions, and to the amount and kind of material available at time of death. One thing is strikingly noticeable, and that is the apparent callousness of the natives as to whether they dispose, by burial or otherwise, of the whole body or only a part of it. This is continually emphasised by various authors although reference is not made to it in so many words; consequently the so-called "coffins" contain as a rule only a small fraction of the original body, as will be seen when considering the accompanying reproductions.

(1) Walter E. Roth, *North Queensland Ethnography*, Bulletin No. 9.
Records of Australian Museum Vol. 6, No. 5, 18th July, 1907.

PLATE 4.

Mummy of adult aboriginal from Trinity Bay, Queensland.

Specimen: No. Q.E. 12/109.

Interest in this specimen lies in the fact that although it has been prepared according to the customary methods, the precaution seems to have been taken of removing the kneecap of the dead man prior to burial with a view to prevent "walking." Reference is made to this specimen by Thomas ⁽¹⁾.

⁽¹⁾ N. W. Thomas, "Natives of Australia," London, 1906.



MUMMY OF AN ADULT.
Q. M. Specimen No. Q. E. 12/109.

Face page 8.

PLATE 5.

An adult aboriginal mummy from Johnstone River, Queensland.

Specimen: No. Q.E. 11/88.

This body was that of a very small type of man. The teeth are those of an adult and are much worn.



MUMMY OF AN ADULT.
Q. M. Specimen No. Q. E. 11/98.

PLATE 6.

Mummy of an aboriginal child from Cairns, Queensland.

Specimen: No. Q.E. 11/87.

Much desiccated. Greater part of the head missing and lower jaw toothless.

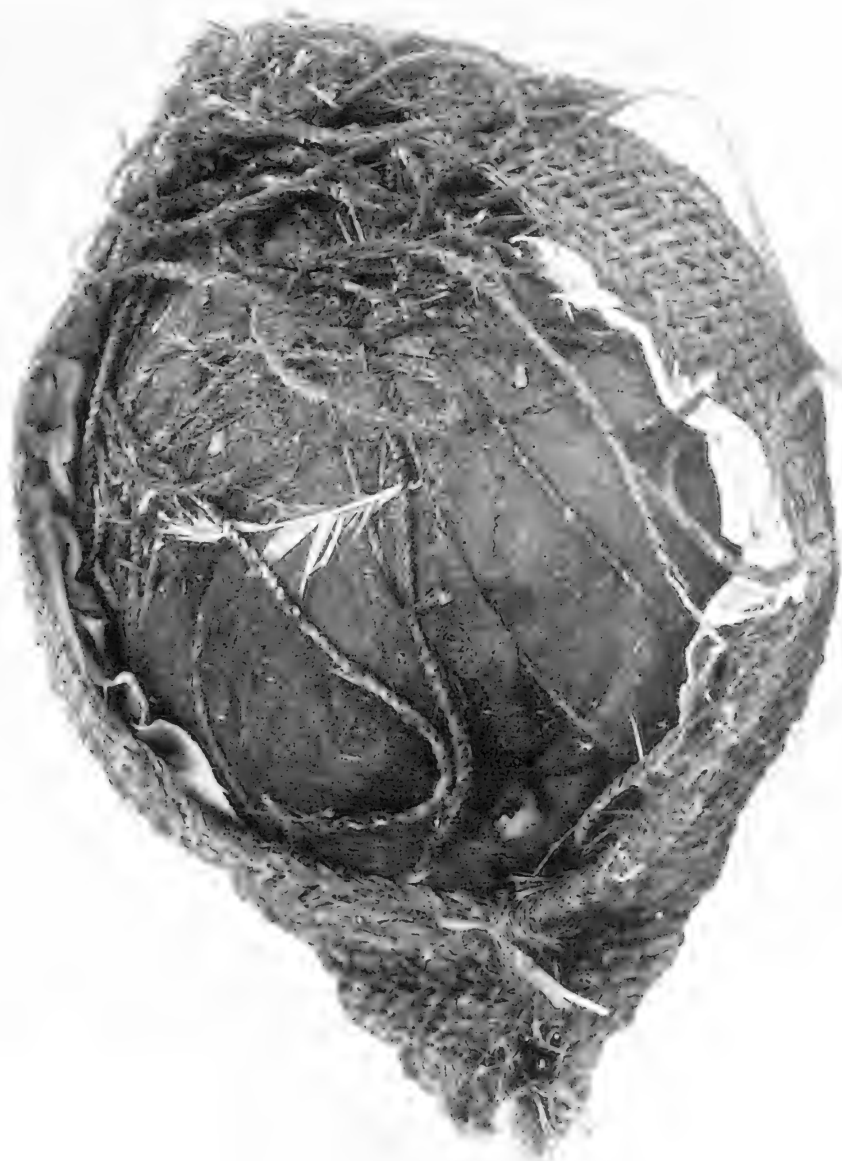


MUMMY OF A CHILD.
Q. M. Specimen No. Q. E. 11/87.

PLATE 7.

Specimen: No. Q.E. 12/124.

Skull of infant wrapped in dilly-bag as carried about by the mother.
Embley River, Queensland.



THE SKULL OF AN INFANT.
Q. M. Specimen No. Q. E. 12/124.

PLATE 8.

Specimen: No. Q.E. 11/65.

Skeleton (incomplete) of aboriginal youth wrapped in banana leaves and bound round with lawyer-cane. From Goondi, Johnstone River, Queensland. Dimensions, 25 in. x 12 in.



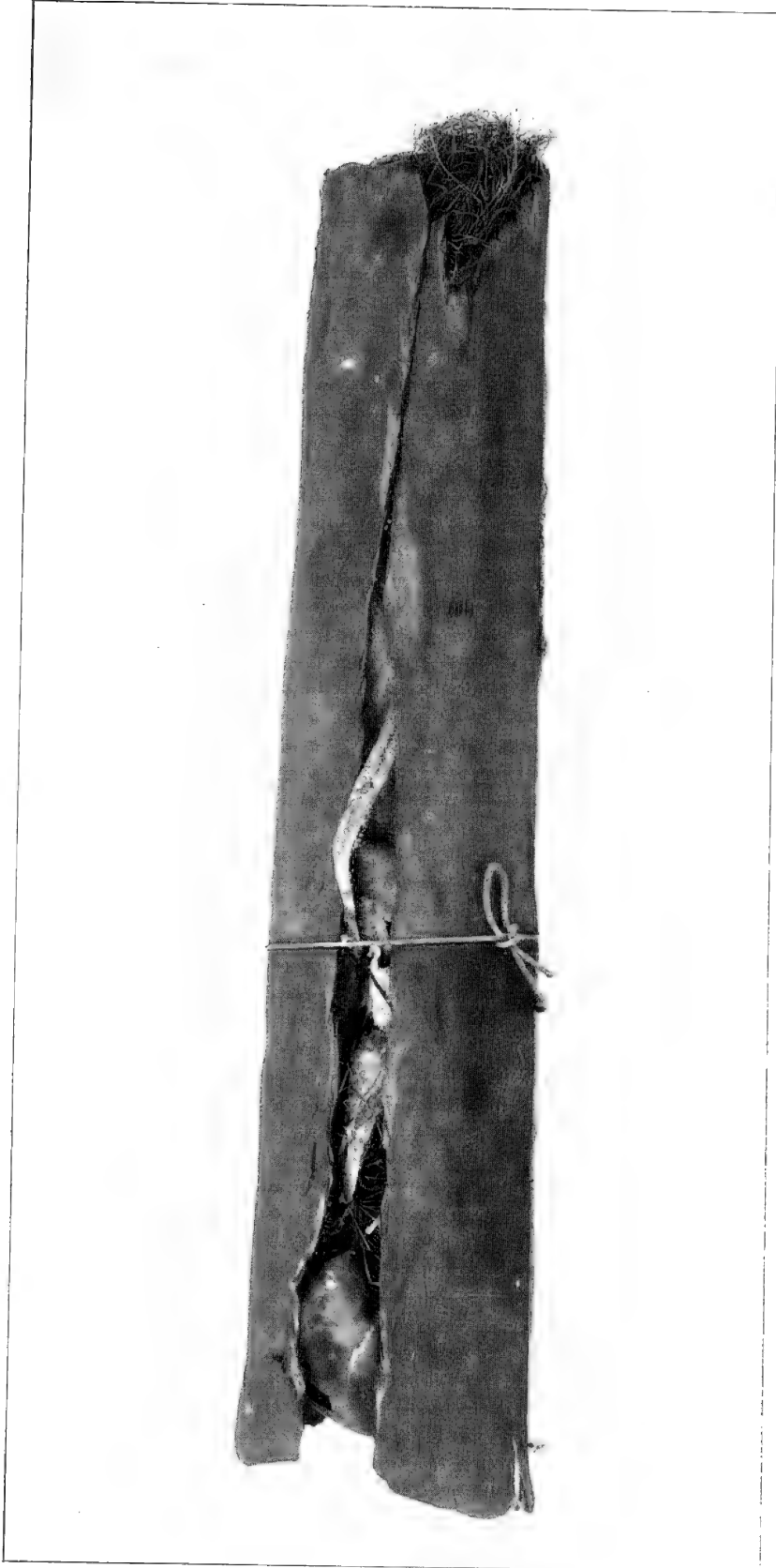
SKELETON WRAPPED IN BANANA LEAVES.
Q. M. Specimen No. Q. E. 11/65.

PLATE 9.

Specimen: No. Q.E. 12/84.

Skeleton of aboriginal infant enclosed in bark cylinder and filled up with dry grass. Nearly complete. Length, 31 in. From a cave at the head of Maranoa River, Queensland.

QUEENSLAND ABORIGINES.



SKELETON OF A CHILD ENCLOSED IN A BARK CYLINDER.
Q. M. Specimen No. Q. E. 11/84.

PLATE 10.

Specimen: No. Q.E. 12/185.

Remains of aboriginal, mostly small, contained in a bark cylinder, tied tightly with native cord and cemented with native gum. Fragile. Length, 34 in.

Loc.: Queensland; exact locality unknown.

QUEENSLAND ABORIGINES.



SKELETON REMAINS IN BARK CYLINDER.
Q. M. Specimen No. Q. E. 12/185.

PLATE 11.

Specimen: No. Q.E. 11/86.

A dilly-bag containing bones of relatives and carried by women for certain moons and then placed by them in a hollow tree.

Loc.: Queensland. Exact locality unknown.

Specimen: No. Q.E. 11/89.

Bark coffin of the pleat type used by the natives on the Laura River for their distinguished dead. Skeleton incomplete, head missing. Dimensions, 19 in. x 10½ in. The trough is unlined, the skeleton having been covered on top only with a thin layer of bark.

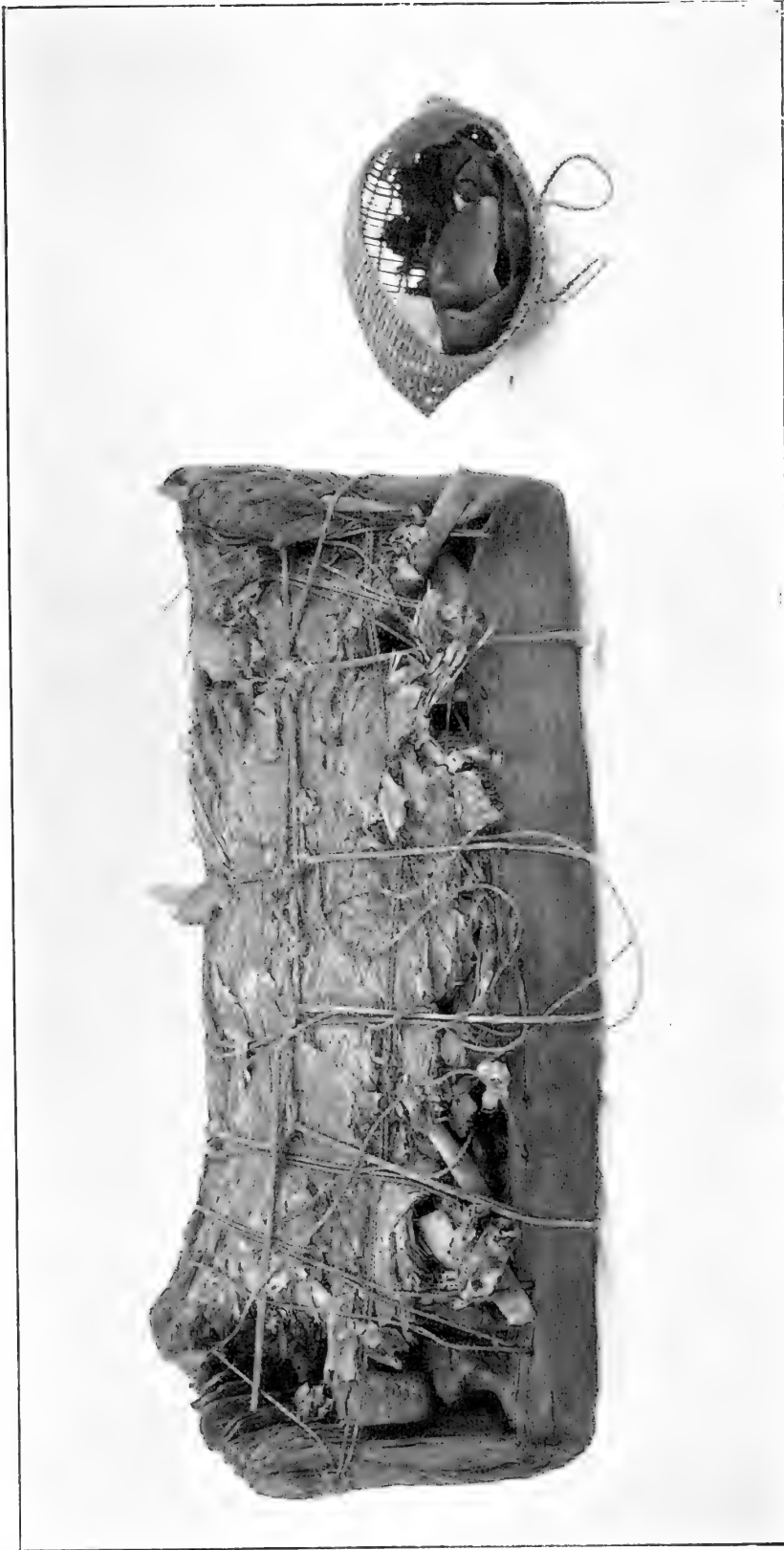
(Not illustrated.)

Specimen: No. Q.E. 12/186.

A human skin, consecrated to the memory of a relative, in good state of preservation.

When a man is killed, or dies, in the vigour of manhood, his nearest relatives summon all their friends to a feast, and the body is skinned, cut up, and devoured amidst the wailing of women and the mournful chantings of men who detail in melancholy and monotonous strains the virtues of the deceased and the chief occurrences of his life.

The skin is stretched upon two spears and rubbed with grease and charcoal in order to assist its preservation. From a cave, Blackall Range, Queensland.



A.
BARK COFFIN.
Q. M. Specimen No. Q. E. 11/89

B.
DILLY BAG WITH BONES.
Q. M. Specimen No. Q. E. 11/86.



HERPETOLOGICAL NOTES.

BY H. A. LONGMAN.

DURING the last few months opportunity has been provided for a more systematic arrangement of the reference collection of Snakes and Lizards in this Museum. When completed this will give facilities which have not previously existed for herpetological work. In this process, and in the working up of new specimens, material has been afforded for the following notes.

DENISONIA FENESTRATA, De Vis.*

This is identical with *Glyphodon tristis*, Gunther, of which De Vis had probably no specimens with typical markings available for comparative purposes. An examination of a series of six specimens of this snake brings to light but little variation. It may be noted, however, that one example from British New Guinea has three only of the lower labials in contact with the anterior chin-shields.

DENISONIA FORRESTI, Blgr.†

From Careena Station in Western Queensland comes a snake which is of special interest, as it is almost identical with the above species, described by Boulenger from Alexandria in the Northern Territory. Our specimen is pale olive-brown above, and on the body the scales show very numerous minute dots. The lower parts, including the last row of body scales on each side, are yellowish white. A very narrow suture between the præfrontal and second labial prevents the nasal and præocular from being in contact, all four shields almost meeting. Scales in 19 rows. Ventrals 164; anal entire; subcaudals 33. Total length 445 mm.; tail 35. Reg. No. J 12/110.

In other particulars our specimen agrees with Boulenger's description. As that authority notes, this species is allied to *D. suta*, Peters, and *D. frontalis*, Douglas Ogilby. Of the latter snake a distinct variety, *propinqua*, was described by De Vis in the Annals of the Queensland Museum, No. 6, p. 51.

PLATURUS COLUBRINUS, Schneid.

A young specimen, secured off the Queensland coast, has been named as this species after a little hesitation. In some respects it suggests an intermediate form between *P. colubrinus*, Schneid, and *P. laticaudatus*, Linn., but the variability of the lepidosis of these snakes is so considerable that the writer does not feel justified in doing more than note its characteristics, which are as follow:—Rostral deeper than broad; no azygous shield either between the præfrontals

* Annals of the Queensland Museum, No. 6, p. 50. This publication was issued in September, 1905, but no date was attached.

† Ann. and Mag. N.H. 7, 18 (1906), p. 440.

or the internasals; frontal as long as the parietals; one præ- and two post-oculars. Seven upper labials, third and fourth entering the eye. Temporals 1 + 2. Scales in 23 rows. Ventrals not keeled, 236, the first ten being much smaller; subcaudals 43. There are 63 annuli, which are narrower than the interspaces. Color as in *P. colubrinus*.

Total length 480 mm.; tail 50. Reg. No. J 12/304.

PSEUDECHIS MORTONENSIS, De Vis.

In the description of this snake in the Annals of the Queensland Museum, No. 10, page 24, a somewhat obvious printer's error occurs. The length of the tail should be 200 mm., and not 20. Since this species was described two further specimens have been secured. The Blue-bellied Black Snake is the local name.

PSEUDELAPS SUTHERLANDI, De Vis.*

In many specimens of juvenile *Diemenias* the conspicuous markings are so distinct from the sober uniformity of typical adults that it is not surprising that several forms have been described as new species in other genera, such as *Pseudelaps* and *Furina*. To Mr. D. B. Fry, of the Australian Museum, Sydney, we are indebted for a suggestion that *Pseudelaps sutherlandi*, De Vis, is another case in point, Mr. Fry having examined the type when recently in Brisbane. Were the type a new accession the writer would have no hesitation in referring this supposititious *Pseudelaps* to certain young specimens of *Diemenia* in our collection labelled *D. modesta*, Gunth. But *D. modesta* is recognised as a Westralian species, and although our Museum register records nine specimens as having been secured in Eastern Queensland, several of these which are available for examination have proved to be forms of either *textilis* or *nuchalis*. Doubtless with one of these three species *P. sutherlandi* should be placed, though, with the limited range of young specimens at command, the writer has hesitancy in definitely allocating it. *Pseudelaps bancrofti*, De Vis, † has also affinities with *Diemenia nuchalis* in its juvenile forms. It is hoped that a completer range of specimens will one day give an opportunity for an arbitrary pronouncement on these points.

TYPHLOPS LEUCOPROCTUS, Blgr.

Through the kindness of Mr. J. R. Tosh we are able to note Darnley Island as a new locality for this blindworm. This is the first record, so far as our knowledge goes, of a terrestrial reptile from that island.

DIPLODACTYLUS CILIARIS, Blgr.

From the Bishop of Carpentaria, who bears the honoured name of Gilbert White, a specimen has been received of *Diplodactylus ciliaris*, Blgr., "found on an oleander bush at Normanton." This gecko differs from its normal form, as described by Boulenger, in having its rostral not completely divided medially. Its tail presents quite a distinct appearance from that of a typical specimen, but it is obviously a second edition. Instead of bearing but two series of spines, this

* Proc. Roy. Soc. Qld., 1884, p. 139.

† Annals of the Queensland Museum, No. 10 (1911), p. 25.

tail is covered, except in the anterior portion, with an imbricated series. Towards the tip the spines are much longer and they extend over the sides. In other respects the general contour of this renewed tail presents no marked difference from an original one.

Reg. No. J 12/312.

VARANUS VARIUS, Shaw.

The omnivorous characteristics of Australian Monitor Lizards (Varanidæ) have often been placed on record. A notable example of the voracity of the common *Varanus varius*, Shaw, was recently secured for the Queensland Museum. This shows a large specimen with the remains of *Tachyglossus aculeatus*, Shaw, partially engulfed in its capacious jaws. But the spiny Echidna proved too tough a meal for even a Monitor Lizard, and both animals perished in the struggle.

SILUBOSAURUS ZELLINGI, De Vis.*

Further specimens having been received of the spiny-tailed Egernias—*E. stokesii*, Gray, and *E. depressa*, Gunth., a re-examination has been made of *Silubosaurus zellingi*, De Vis. This confirms the query of Boulenger, in the B.M. Catalogue of Lizards, that this species is not specifically distinct from *Egernia stokesii*. Locality, Barcoo, W.Q.

* Proc. Roy. Soc. Qld. 1884, p. 53.

ON SOME QUEENSLAND FISHES.

BY J. DOUGLAS OGILBY.

(Plates 12-14 and 2 text figures.)

IN the following pages forty-one species of Queensland fishes are more or less fully discussed. These may be separated in five sections as follow:— Undescribed species, redescribed species, species not hitherto recorded from the State, additional information on little-known forms, and corrections.

To the first section belong—

1. SCOLIODON AFFINIS; fam. *Carcharhinidæ*; Snapper Banks off Moreton Bay.
2. SCOLIODON LONGMANI; fam. et distr. eid.
3. RHINOPTERA NEGLECTA; fam. *Aëtobatidæ*; Moreton Bay.
4. GALAXIAS O'CONNORI; fam. *Galaxiidæ*; Mountain Streams of Southern Queensland.
5. DORYCHITHYS STICTORHYNCHUS; fam. *Syngnathidæ*; Coast of South Queensland (Moreton Bay).
6. ATHERINA HONORLE; fam. *Atherinidæ*; Coast of South Queensland (Nerang Creek).
7. PSEUDORHOMBUS ELEVATUS; fam. *Bothidæ*; Coast of South Queensland (Moreton Bay).
8. PSEUDORHOMBUS CARTWRIGHTI; fam. et distr. eid.
9. PSEUDORHOMBUS ANOMALUS; fam. et distr. eid.
10. LEIOGNATHUS MORETONIENSIS; fam. *Leiognathidæ*; Coast of South Queensland.
11. KYPHOSUS GIBSONI; fam. *Kyphosidæ*; Coast of South Queensland (Moreton Bay).
12. SIGANUS CONSOBRINUS; fam. *Siganidæ*; Coast of South Queensland, generally distributed.
13. SIGANUS AUROLINEATUS; fam. ead.; Coast of North Queensland (Somerset).

14. SPHEROIDES TUBERCULIFERUS; fam. *Tetraodontidæ*; Coast of South Queensland (Moreton Bay).
15. ANTENNARIUS STIGMATICUS; fam. *Antennariidæ*; Coast of South Queensland (Moreton Bay).

To the second section belong—

1. ATHERINA PINGUIS Lacépède; fam. *Atherinidæ*; Indian and Pacific Oceans.
2. ATHERINA LACUNOSA Forster; fam. ead.; Western Pacific (New Caledonia and Moreton Bay).
3. LETHRINUS LATICAUDIS Alleyne & Macleay; *Sparidæ*; Coasts of Middle and North Queensland.
4. LEIOGNATHUS HASTATUS Ogilby; nom. nov. for *Equula longispina* De Vis, preoccupied; fam. *Leiognathidæ*; Coast of North Queensland (Cape York).

To the third—

1. LYCODONTIS MARGARITOPHORUS (Bleeker); fam. *Murauidæ*.
2. STIGMATOPHORA NIGRA Kaup; fam. *Syngnathidæ*.
3. PEGASUS DRACONIS Linnæus; fam. *Pegasiidæ*.
4. PARATRACHICHTHYS ELONGATUS Günther; fam. *Trachichthyidæ*.
5. LOPHONECTES GALLUS Günther; fam. *Bothidæ*.
6. EPINEPHELUS HOEDTH Bleeker; fam. *Serranidæ*.
7. LEPTOSCOPUS MACROPYGUS Richardson; fam. *Leptoscopidæ*.
8. GASTEROCHISMA MELAMPUS Richardson; fam. *Scombridæ*.
9. EUMYCTERIAS CALLISTERNUS Ogilby; fam. *Tropidichthyidæ*.
10. LEPADICHTHYS FRENATUS Waite; fam. *Gobiesocidæ*.

In the fourth the claims of *Tæniura lymma* and *Leiuranus semicinctus* to inclusion in our fauna are further strengthened, and the ranges of *Amia berthæ* and *Tathicarpus muscosus* are extended, while in the fifth the relationships of *Jenynsella weatherilli* Ogilby, *Homalogrystes luctuosus* De Vis, *Chatodon aurora* De Vis, *C. nigripes* De Vis, *C. germanus* De Vis, *Holacanthus sphynx* De Vis, and *Salarias lincolatus* Alleyne and Macleay, are determined.

CARCHARHINIDÆ.

The genus *Scoliodon* was established in 1837 by Drs. Müller and Henle for the accommodation of certain "blue sharks," which differ from Blainville's *Carcharhinus*¹ chiefly in their small size and less specialized dentition, the teeth

¹ Journ. Phys., 1816, p. 164 (*commersonii*=*lamia*).

being wholly free from serræ. In the "Systematische Beschreibung der Plagiostomen" of these authors, published four years later, *Scoliodon* is reduced to the rank of a subgenus¹ of *Carcharias* Cuvier² (not *Carcharias* Rafinesque³) which is synonymous with *Carcharhinus* Blainville. Three species are described under this subgenus, namely—*Carcharias (Scoliodon) laticaudus* Müller & Henle⁴ *C. (S.) acutus* Rüppell, and *C. (S.) lalandii* Müller & Henle,⁵ the latter being identical with the *Squalus (Carcharias) terra-novæ* of Sir John Richardson,⁶ a Florida species erroneously ascribed by its author to Newfoundland, hence the specific name. In 1856 Bleeker added two species under the names *Carcharias (Scoliodon) dumerilii*⁷ and *C. (S.) walbechmi*.⁸ In the "British Museum Catalogue of Fishes" these five species were redescribed by Dr. Günther. No addition was then made to the ranks of the genus until 1882, in which year Professors Jordan and Gilbert made known a second American species, for which they proposed the name *Carcharias longurio*.⁹ It will thus be seen that up to 1896, when Jordan and Evermann published the first part of their monumental work on the "Fishes of North and Middle America," ichthyologists had been content to relegate *Scoliodon* to the subordinate position of a subgenus of Cuvier's *Carcharias*, but the last-named authors reinstated it in its generic rank, making it equivalent with *Prionace*¹⁰ and *Carcharhinus*, a conclusion with which I am cordially in agreement. Rather more than four years ago the writer was fortunate enough to be present at the capture of a shark on the Snapper Banks off Moreton Bay, which on examination proved to be an undescribed species, and which he subsequently described as *Scoliodon jordani*, in commemoration of Prof. Jordan's visits to Brisbane at that time. The present paper adds two more species to the Queensland list, so that no less than four of the nine recognized species are inclusive in the fauna of this State.

¹ That this alteration was only made after much consideration is shown by the fact that in the Plagiostomen there are two separate sheets bearing the pagination 27 and 28. On the first *Scoliodon* is treated as a genus, on the second, which in view of the succeeding pages assuredly represents the final decision of the authors, as a subgenus.

² Règne Animal, ed. 1, 1817, p. 125 (*lamia*).

³ Caratt. d'alc. nuov. Gen., 1810, p. 10 (*taurus*).

⁴ Plagiost., 1841, p. 28, pl. viii.

⁵ Plagiost., 1841, p. 30.

⁶ Faun. Bor. Amer., iii, 1836, p. 239.

⁷ Act. Soc. Sci. Ind. Neerl., i, 1856, Amboina, p. 70.

⁸ Nat. Tijds. Ned. Ind., x, 1856, p. 353.

⁹ Proc. U.S. Nat. Mus., 1882, p. 406.

¹⁰ Cantor, Journ. As. Soc. Bengal, xviii, 1849, p. 1381. Substitute for *Prionodon* Muller & Henle, preoccupied in Mammals.

KEY TO THE QUEENSLAND SPECIES.

- a*¹. Length of anal much less than its distance from the ventrals.
- b*¹. First dorsal fin higher than long.
- c*¹. Labial groove very short, directed outwards from the angle of the mouth.
- d*¹. Preoral length 1.9 in head; eye midway between tip of snout and fourth gill-opening; second dorsal nearer origin of first than tip of tail; anal partly below second dorsal; pectoral extending well beyond origin of first dorsal 1. *affinis*.
- d*². Preoral length 2.5 in head; eye midway between tip of snout and second gill-opening; second dorsal much nearer tip of tail than origin of first; anal wholly in advance of second dorsal; pectoral extending to below origin of second dorsal 2. *jordani*.
- b*². First dorsal fin longer than high; anal fin partly below second dorsal.
- e*¹. Labial grooves very short, extending along both jaws; eye midway between tip of snout and first gill-opening; second dorsal nearer origin of first than tip of tail; pectoral fin extending to below origin of first dorsal 3. *acutus*.
- e*². Labial grooves well developed; eye midway between tip of snout and second gill-opening; second dorsal midway between origin of first and tip of tail; pectoral fin extending to below middle of first dorsal 4. *longmani*.

SCOLIODON AFFINIS sp. nov.**Long-nosed Dog Shark.**

Depth of body 9, length of head 5.35, predorsal length 3, length of caudal 3.6, of pectoral 7.75 in total length. Width of head 2, depth of head 2.8, preoral length 1.9, interocular width 2.2, internasal 3.25, width of mouth 3, vertical height of first dorsal 2.45, length of ventral 2.8 in length of head.

Body slender and compressed, conspicuously convex between the occiput and the first dorsal fin, its greatest width 1.66 in its depth. Head strongly depressed, its length 1.5 in that of the trunk. Snout produced and pointed, its length equaling the space between the eye and the last gill-opening and 1.6 time the width of the mouth, which is one seventh more than its ramal length. Space between inner angle of nostril and mouth 1.85 in its distance from the tip of the snout; tip of mandible broadly rounded, extending forward to the vertical from the middle of the eye; no lower labial groove, the upper very short and directed outwards at a right angle to the jaw. Teeth in $\frac{11-1-11}{11-1-11}$ series, those of the upper jaw oblique, with the inner edge slightly angulated mesially, those of the lower linear and nearly horizontal. Diameter of eye 3.5 in the preoral length, which is one fifth more than the interocular width. Tail about one seventh longer than the head and trunk.

First dorsal fin inserted one fifth nearer to the ventral than to the pectoral, its anterior border mostly linear with the outer angle pointed; posterior angle produced and acute, not quite reaching to the vertical from the ventral; vertical height of fin a little more than its basal length. Second dorsal inserted one fifth nearer to the origin of the first than to the tip of the tail; interdorsal space 1.4 in the predorsal length, and 3.25 times the base of the first dorsal. Caudal fin long, the upper angle pointed; anterior border of lower lobe 3 in the upper lobe. Anal fin terminating below the middle of the second dorsal, its length 2.1 in its distance from the caudal, which is 1.25 in that from the ventral. Pectoral fin inserted about one tenth nearer to the ventral than to the tip of the snout and extending to below the anterior third of the first dorsal, the anterior and posterior borders convex, the outer emarginate; upper angle sharply, lower more bluntly rounded, the latter but little produced. Space between ventral and anal 1.2 in its distance from the pectoral. Last gill-opening 1.33 in the third, which is 1.25 in the eye-diameter.

Dark blue above, shading through gray on the lower sides to silvery white below. Iris blue. Anal, pectoral, and ventral fins edged with white. (*affinis*, allied to.)

Total length (of type) 526 millim.

Coast of Southern Queensland.

Described from the single example as yet known, a young male which was taken by myself on a line off Noosa Head on the 6th of August, 1909. Type in the A.F.A.Q. collection, Cat. No. 1524.

This species approaches *S. dumerilii* more closely than to any other species of *Scyliodon*, but may be distinguished by the longer anal fin, which (*vide* Günther¹) is never more than one third of its distance from the ventral. The greater length of the snout, which considerably exceeds the space between the eye and the root of the pectoral, and the more backward extension of that fin are also noteworthy.

SCYLIODON LONGMANI sp. nov.

Longman's Dog Shark.

Depth of body 8.6, length of head 5.25, predorsal length 3.25, length of caudal 3.7, of pectoral 8.15 in total length. Width of head 1.8, depth of head 2.25, preoral length 2.25, interocular width 2.25, internasal width 3.95, width of mouth 2.8, vertical height of first dorsal 2.25, length of ventral 2.5 in length of head.

¹ Brit. Mus. Catal. Fish., viii, 1870, p. 359.

Body rather slender and but little compressed, with a gentle convexity from the eye to the first dorsal, its greatest width 1.25 in its depth. Head strongly depressed, its length 1.4 in that of the trunk. Snout produced and sharply rounded, its length equaling the space between the eye and the second gill-opening and 1.2 time the width of the mouth, which is one third more than its ramal length. Space between inner angle of nostril and mouth 1.7 in its distance from the tip of the snout; tip of mandible rounded, not extending forward to the vertical from the front margin of the eye; labial grooves well developed, the upper the longer, three fourths of the space between the eye and the mouth. Teeth in $\frac{13-1-13}{11-1-11}$ series, those of both jaws with the inner border obliquely linear, the outer deeply notched. Diameter of eye 3.7 in the preoral length, which is equal to the interocular width. Tail about one tenth longer than the head and trunk.

First dorsal fin equidistant from the pectoral and ventral, its anterior border linear with the outer angle sharply rounded, the posterior angle produced and acute, reaching to the vertical from the origin of the ventral; vertical height of fin 1.1 in its basal length. Second dorsal inserted a little nearer to the origin of the first than to the tip of the tail; interdorsal space 1.25 in the predorsal length and 2.6 times the base of the first dorsal. Caudal fin long, the upper angle obtusely pointed; anterior border of lower lobe 3 in the upper lobe. Anal terminating below the anterior third of the second dorsal, its length 1.7 in its distance from the caudal, which is 1.1 in that from the ventral. Pectoral fin inserted two fifths nearer to the ventral than to the tip of the snout and not quite extending to below the middle of the first dorsal, the anterior border linear, the posterior convex, the outer feebly emarginate; upper and lower angles rounded, the latter but slightly produced. Space between ventral and anal fins 1.6 in its distance from the pectoral.

Last gill-opening 1.1 in the third, which is equal to the eye-diameter.

Blue-gray above, shading into whitish below. Outer edge of first dorsal, upper, posterior, and part of the lower edge of the caudal blackish.

Described from an immature male, 452 millim. long, obtained in Moreton Bay, and now in the possession of the Queensland Museum; Reg. No. I. 292.

I have much pleasure in naming this distinct species after my friend and colleague Heber Albert Longman, Queensland biologist.

DASYBATIDÆ.

TÆNIURA LYMMA (Forskål).

Twenty-seven years ago the writer identified an old spirit specimen from Cape York in the Australian Museum collection, since which time it does not seem to have been noticed on the Australian Coast. It is, therefore, with great pleasure that I am able to record the reception of a beautifully marked young male from Darnley Island, whence it was forwarded by Mr. J. R. Tosh.

AËTOBATIDÆ.

RHINOPTERA NEGLECTA sp. nov.**Australian Cow-nose Ray.**

Disk more than twice as broad as long; median notch of snout deep. Nine series of teeth in each jaw, those of the middle upper series eight times as wide as long and one and two thirds time as wide as the adjacent series; middle lower teeth a little wider than the upper.

Width of disk 86 cm.

Moreton Bay.

In the first part of the second volume of the Royal Society of Queensland Mr. De Vis recorded the specimen here briefly described under the name *Rhinoptera javanica*, but the characters relied on above show that it is more closely allied to the Brazilian *R. jussieui* than to the Malayan species. This unique Australian specimen is unfortunately in such wretched condition as to preclude a more detailed description.

APLOCHITONIDÆ.

In part 9 of the Annals of the Queensland Museum I described under the name of *Jenynsella weatherilli* a small fish collected by Mr. W. Weatherill in Enoggera Creek; being under the impression that it was scaleless I placed the genus in the neighborhood of *Aplochiton*. During the past winter several fine examples were captured in the same locality by Messrs. Marshall and Catchpole, which coming into my hands in a fresh state I at once perceived to be covered by small delicate scales. This fact naturally brought to my mind Weber's much desired *Prototroctes semoni* from the Burnett River, and a further examination confirmed the identity of the two fishes. The synonymy of the species should therefore stand as follows—

JENYNSELLA SEMONI (Weber).

Prototroctes semoni Weber, Zool. Forsch., 1895, p. 274.

Jenynsella weatherilli Ogilby, Ann. Queensl. Mus., pt. 9, 1908, p. 15.

From the fact that for several years this smelt has been persistently but vainly sought for during the summer months, and that it was rediscovered in considerable numbers during last August (the month of its original discovery near Brisbane), we may well surmise that it is a migratory anadromous species, ascending our creeks during the winter months for the purpose of depositing its spawn.

GALAXIIDÆ.

GALAXIAS O'CONNORI *sp. nov.*

Queensland Mountain Trout.

Depth of body 7.33, length of head 4.52 in length of body. Diameter of eye 1.21 in length of snout and 4.42 in that of the head; width of interorbit 4.87 in the head. Lower jaw slightly projecting; maxillary extending to below the anterior border of the eye. Dorsal 2 + 8; space between origin of dorsal and root of caudal 3.62 in the length of the body. Anal 3 + 9, originating below the last third of the dorsal and not extending to the caudal when depressed. Pectoral extending four ninths of the distance between its origin and the ventral. Ventral 7-rayed, originating one eighth nearer to the root of the caudal than to the tip of the snout, extending half the distance between its origin and the anal. Caudal emarginate; caudal peduncle three fifths longer than deep. Light brown, profusely spotted with darker brown; fins immaculate.

Our single specimen comes from Lyra, near Stanthorpe, and measures 77 millim. It was presented to the Queensland Museum by Mr. Daniel O'Connor, and I am pleased to have the opportunity of naming this, the first Queensland galaxiid, after my old and valued friend, to whom also the State owes a debt of gratitude for having taken living specimens of our Queensland Lungfish (*Neoceratodus forsteri*) to England and the Continent, and thus giving our friends on the further side of the globe the opportunity of seeing in a living state one of the most marvelous of the products of our land, the ancestors of which at one time peopled the valleys where the Thames now runs. Reg. No. I. 421.

According to Mr. Tate Regan's able "Revision of the Fishes of the Family Galaxiidae" the nearest ally of our species is *Galaxias ornatus* Castelnau, only known at present from Cardinia Creek, Victoria.

OPHICHTHYIDÆ.

LEIURANUS SEMICINCTUS (Lay and Bennett).

Last year Mr. Allan R. McCulloch, of the Australian Museum, Sydney, exhibited before the Linnean Society of New South Wales a specimen of this handsome eel, which he had personally collected at Murray Island, Torres Strait; this was said to be the earliest Australian record of the species. I have now much pleasure in recording a second specimen, which has been forwarded by Mr. J. R. Tosh from Darnley Island.

MURÆNIDÆ.

LYCODONTIS MARGARITOPHORUS Bleeker.

During December of last year I received from Mr. Fred. Leftwich a collection of fishes and crustaceans obtained by him in the Wide Bay District. Among other rarities contained therein I found a small but beautifully preserved example of this rare and handsome Reef Eel. I have retained Bleeker's name for the Queensland fish, because the series of oro-opercular spots, which form so conspicuous a character in his specimen, are equally well marked in mine, in which however they are supplemented by several large irregular spots on the cheeks and lower opercular bones. Nevertheless it must be admitted that, even after so brief a period (not more than six months) of immersion in a 2½ per cent. formalin solution, these markings have perceptibly faded, and it may well be that in the old Madagascar example, which alone was available to Günther, they have wholly disappeared. The question therefore of the identity of Bleeker's species with *L. stelliferus* (Richardson)¹ must still remain in abeyance, until such time as opportunity is given to compare a representative series of specimens from so widely separated localities. My specimen, which bears the Cat. No. 1732 in the A.F.A.Q. Mus., measures 158 millim., and is therefore somewhat shorter than the British Museum type of *L. stelliferus*, 168 millim.

Günther in his latest publication² places *L. margaritophorus* in the synonymy of *L. undulatus*,³ from which he omits *L. stelliferus*, thus divorcing the species which he had previously considered varietal. This may be correct, but in any case the above is, so far as I can ascertain, the first Australian record of the occurrence of this very handsome variety.

SYNGNATHIDÆ.

DORYICHTHYS STICTORHYNCHUS sp. nov.

Osseous rings 21 + 24. Trunk hexagonal and moderately robust, its depth slightly more than its width and 1.25 in the postorbital portion of the head. Dorsal profile transversely linear, the ridges moderately elevated cultriform and smooth, continuous with the upper caudal ridges; sides above the lateral ridge convex, below concave; lateral ridge curved downwards posteriorly, uniting with the lower caudal ridge at the suture of the first and second caudal rings. Tail tetragonal, the caudal ridges rough but not spinulose, its length 1.37 in that of the head and trunk.

¹ *Muræna stellifera* Richardson, Zool. Erebus & Terror, Ichth., 1846, p. 86.

² Journ. Mus. Godeffr., Heft ix, 1910, p. 413.

³ *Murænophis undulata* Lacépède, Hist. Nat. Poiss., v, 1803, pp. 629 & 644.

Length of head 3 in that of the trunk and 6·9 in that of the body, the frontal region but little deflected from the level of the snout. Snout straight, with a well developed keel above, terminating between the eyes, a lateral keel terminating in front of the eye, and a pair of inferior keels, divergent posteriorly, and terminating at the opercle, its length 1·86 in that of the head. Interorbital region convex, its width 1·24 in the eye-diameter, which is 3·9 in the length of the snout to the tip of the lower jaw. Occipito-nuchal carina originating a little behind the posterior borders of the orbits and terminating at the last third of the first body (nuchal) ring; it is rather low and is divided by notches into three sections, the anterior (postfrontal) of moderate length and curved outwards anteriorly almost to the upper angle of the right eye,¹ its length twice that of the median (occipital) section, which like the nuchal section is straight; nuchal section longest, 1·5 time the postfrontal; supra-ciliary ridge low, bent downwards behind the eye, where it passes into an irregular carina, which crosses the parietal region; opercle with three well marked slightly divergent median ridges, extending backwards from an anterior tubercle.

Dorsal fin with 41 rays, inserted upon ten rings, two and a half of which belong to the body, its base not elevated, its length equal to the head from the tip of the upper jaw. Caudal fin small and pointed, with 8 rays, which increase in length to the third, below which they become rapidly shorter, its length 3·25 in that of the head. Pectoral with 16 rays, short and broad, scarcely reaching the end of the nuchal ring.

Ovisae occupying 19 body-rings, its length but little less than that of the tail.

Dark olive brown above, paler profusely dotted with brown below. Sides of snout with a series of nine conspicuous black, mostly quadrilateral, spots. Caudal fin black. (*στικτός*, spotted; *ῥύγχος*, snout.)

Described from a male specimen, 188 millim. in length, obtained in Moreton Bay by Mr. J. Palmer, and presented by him to the A.F.A.Q. Mus.; Cat. No. 1741.

Our species may possibly be the male of *Doryichthys bernsteini* Bleeker,² with which it has many characters in common, but cannot possibly be identified with *D. auronitens* Kaup,³ which is a *Doryrhamphus*. From *D. serialis* Günther,⁴

¹ Possibly this is an individual peculiarity and in other specimens the ridge would be straight.

² Arch. Néerl., 1867, p. 398 : Halmaheira (Gilolo).

³ Brit. Mus. Catal. Lophobr. Fish., 1856, p. 59 : Macassar.

⁴ Zool. Alert, 1884, p. 30, pl. iii, fig. B. : Port Molle, Q.

the only other Queensland member of the genus, it differs in the more elongate habit, the trunk being thrice the length of the head, in the increased carination of the opercle, in the increased number of dorsal rays and osseous rings, and in the coloration.

STIGMATOPHORA NIGRA Kaup.¹

There is a specimen of this fish in the A.F.A.Q. Museum, obtained at Bulwer by Mr. J. Palmer. This is the only example of the genus as yet recorded from the State.

NOTE.—The Queensland Museum possesses two examples of *S. olivacea* Castelnau² labeled “South Australia.” The species is certainly valid.

PEGASIDÆ.

PEGASUS DRACONIS Linnæus.³

The Queensland Museum possesses five examples of this hypostomid from the “Coast of Queensland”; Reg. No. I. 146. This is the first record of its occurrence in the State.

ATHERINIDÆ.

On the 18th of last October I received from my valued correspondent Mr. James Palmer, telegraph operator at the Bulwer Station, Moreton Bay, six atherinids, all of which had the dusky-tipped pectoral fins which are supposed to be a distinguishing character of the two species *Atherina lacunosa* and *A. pinguis*,¹ and which have been the direct cause of so much confusion. One of these was easily recognisable as belonging to the former species, which is the common “hardihead” of Moreton Bay, but the most cursory glance was sufficient to show that the remaining five were quite distinct, and a closer examination convinced me that I had unquestionably rediscovered Forster’s long-lost species, about which there has been so much controversy. To facilitate comparison I therefore give detailed descriptions and figures of both species, and woodcuts showing the position of the vent in relation to the ventral and anal fins, as also of a new atherinid here described from the same localities.

¹In order to assist those, who like myself have no access to the works of Schneider and Lacépède, I append here translations of the original descriptions of these two species, as kindly furnished to me by Mr. Allan R. McCulloch, of the Australian Museum, Sydney.

¹ Brit. Mus. Catal. Lophob. Fish., 1856, p. 53.

² Proc. Zool. & Accl. Soc. Vic., i, 1872, p. 244.

³ Syst. Nat., ed. 12, 1766, p. 418.

ATHERINA LACUNOSA:—

Body oblong, lanceolate, subcylindrical, semitransparent, with large rounded silvery scales; firmly adherent and imbricate. Head triangular, nearly linear above, naked, and pitted, with two pits between the eyes, and about 6 grooves on the snout. Cleft of mouth directed obliquely upwards; jaws equal, the lower with rounded apex; teeth very small and closely set; nostrils simple; eyes superior and very large. Opercles naked and silvery. Anus median.

Br. 6. D. 5, 9; P. 17; V. 1/6; A. 15; C. 18.

Caudal forked; posterior anal ray the longer; a slender oblong pointed scale adjacent to the ventral fin.

ATHERINA PINGUIS:—

L'Atherine Grasdeau { Six rays to the first dorsal fin; ten to the second;
(*Atherina pinguis*) { twenty to the anal fin; six to the branchial membrane;
a membrane between the ventrals; the caudal forked.

Atherina pinguis—The gradeau or the grasdeau, a transparent atherine, with denticulated mouth, etc. *Commerson, MSS.*

The *Atherina grasdeau* is yet another species unknown to naturalists. Commerson has seen, described, and figured it. The general color of this fish resembles that of very pellucid water, the back being of a somewhat darker tint; the upper fins are brown, as also is the caudal; the lower white and diaphanous; the pectorals are ornamented with a large transparent silvery transverse band; the interior of the mouth is also of a shining diaphanous white; the iris is silvery. The eyes are but little projecting; the head is destitute of small scales; the opercle is composed of two pieces and is pointed from behind; upper jaw extensible; peritoneum black; the flesh very delicate.

The following characters will suffice to distinguish the three species—

*a*¹. Pectoral fins with dusky tips.

*b*¹. Body robust, its depth about 4.75 in its length; spinous dorsal originating nearer to root of caudal than to tip of snout; base of anal more than its distance from caudal; vent in advance of tips of ventrals .. *pinguis.*

*b*². Body slender, its depth about 6 in its length; spinous dorsal originating midway between root of caudal and tip of snout; base of anal as long as its distance from caudal; vent well behind tips of ventrals .. *lacunosa.*

*a*². Pectoral fins uniform.

*c*¹. Body slender, its depth less than 6 in its length; spinous dorsal originating nearer to tip of snout than to root of caudal; base of anal much shorter than its distance from caudal; vent between tips of ventrals *honoræ.*

2. *ATHERINA PINGUIS* Lacépède.

Atherina pinguis Lacépède, Hist. Nat. Poiss., v, 1803, p. 372, pl. xi. fig. 1: Mauritius. After Commerson—Bleeker, Act. Soc. Sci. Ind. Néerl., viii, 1860, Sumatra 8, p. 24—Günther Brit. Mus. Catal. Fish., iii, 1861, p. 399: Madagascar; Southern Australia; Sydney; Aneiteum, New Hebrides—Klunzinger, Verh. zool.-bot. Ges. Wien, 1870 p. 833: Red Sea—Day, Fish. India, pt. 2, 1876, p. 344: Seas of India—Alleyne & Macleay Proc. Linn. Soc. N.S. Wales, i, 1877, p. 340: Hall Sound, British New Guinea—Kirk, Proc. N.Z. Inst., xii, 1880, p. 309, c. text-fig.: Wellington—Macleay, Proc. Linn. Soc. N.S. Wales, vi, 1881, p. 38—Hutton, Ind. Faun. Nov. Zeal., 1904, p. 46.

Atherina affinis Bennett, Proc. Zool. Soc., 1831, p. 166: Mauritius.

Atherina pectoralis Cuvier & Valenciennes, Hist. Nat. Poiss., x, 1835, p. 447: Ile de France Bourbon; Seychelles.

Atherina lacunosa Günther, Journ. Mus. Godeffr., Heft xiii, 1877, p. 213, pl. cxviii, fig. E. Vaté, New Hebrides; New Caledonia—id., Zool. Challenger, i, 1880, Shore Fish., p. 36: Fiji—Ogilby, Catal. Fish. N.S. Wales, 1886, p. 40—Waite, Synops. Fish. N.S. Wales, 1904, p. 21—id., Rec. Canterb. Mus., i, 1907, p. 15.

Common Hardhead.

Plate 12, fig. 1.

Depth of body 4.63 to 5.02, length of head 3.63 to 3.86, of caudal fin 4.47 to 4.86, of pectoral 4.2 to 4.8, of ventral 7 to 7.33 in length of body. Length of snout 3.85 to 4.25, diameter of eye 2.51 to 2.75, width of interorbit 2.64 to 2.92, length of maxillary 2.42 to 2.76, of mandible 2.03 to 2.17, height of spinous dorsal 2.38 to 2.62, of soft dorsal 1.86 to 2.2, of anal 1.7 to 2.05 in length of head.

Body robust and compressed, its width 1.5 to 1.62 in its depth, which is 1.24 to 1.36 in the length of the head; caudal peduncle long and slender, its least depth 2.13 to 2.5 in its length and 1.28 to 1.44 in the eye-diameter. Width of head 1.13 to 1.2 in its depth, which is 1.41 to 1.61 in its length; snout short and broad, its length 1.43 to 1.7 in the eye-diameter, which is equal to or a little more than the postorbital length of the head. Jaws equal; maxillary extending to below or somewhat beyond the anterior border of the eye, mandible to below the middle of the eye or not quite so far. Interorbital region flat, its width 1 to 1.12 in the eye-diameter; postorbital length of head 1.61 to 1.93 in the rest of the head. Posterior suborbital deeply notched above the angle.

Scales 38 to 40¹/₆. Predorsal scales 19; interdorsal 7; 5 scales between the origin of the soft dorsal and the anal; cheek scales and interopercular scales in a single series each; no axillary pectoral scale; axillary scale of ventral usually present, its length 2.06 to 2.32 in that of the fin and 1.58 to 1.77 in the eye-diameter.

¹ From behind the pectoral to the root of the caudal.

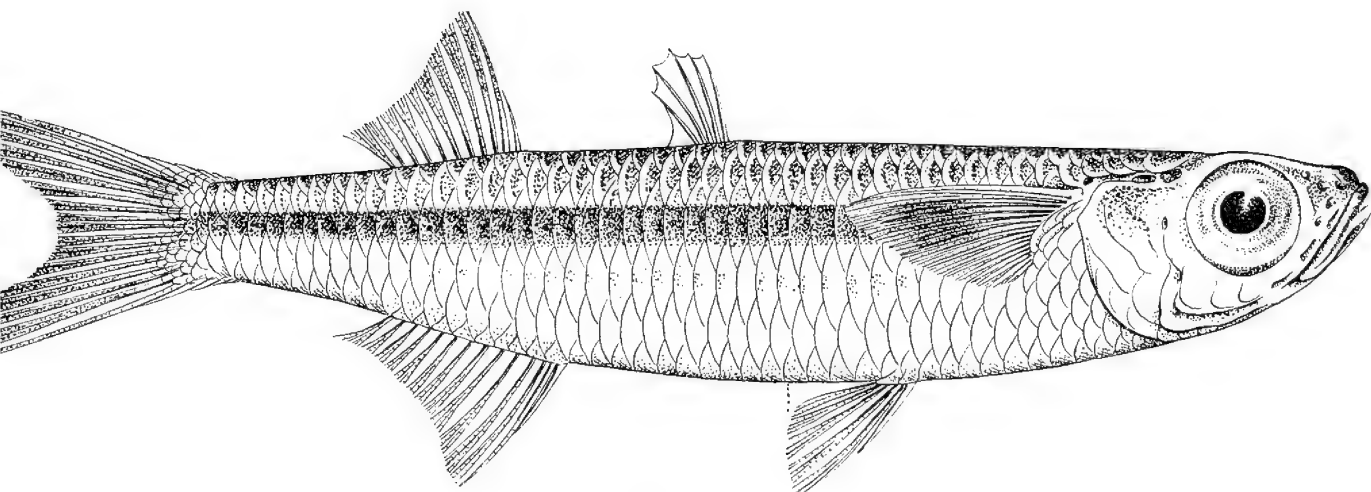


FIG. 1.

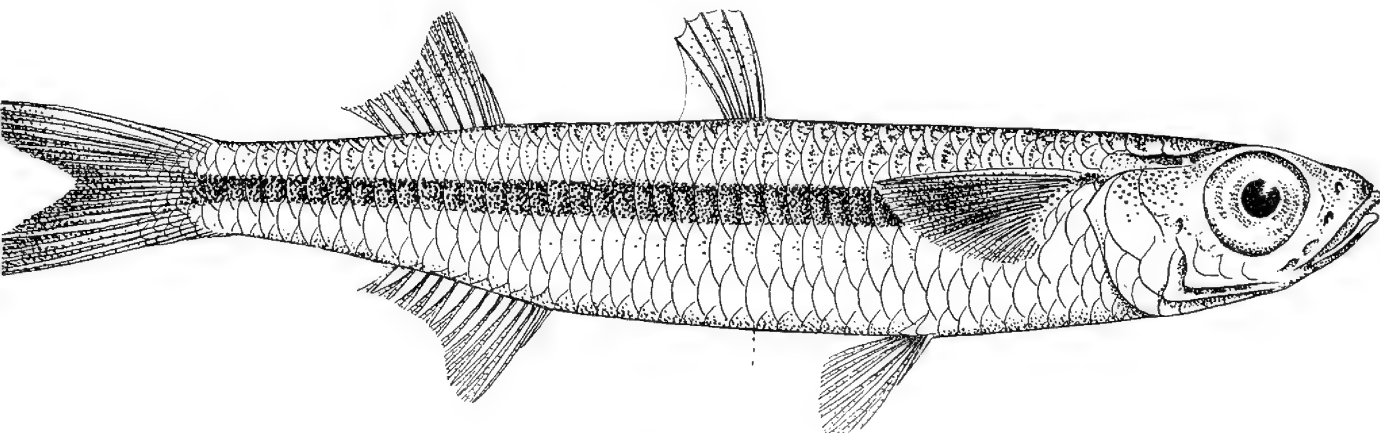


FIG. 2.

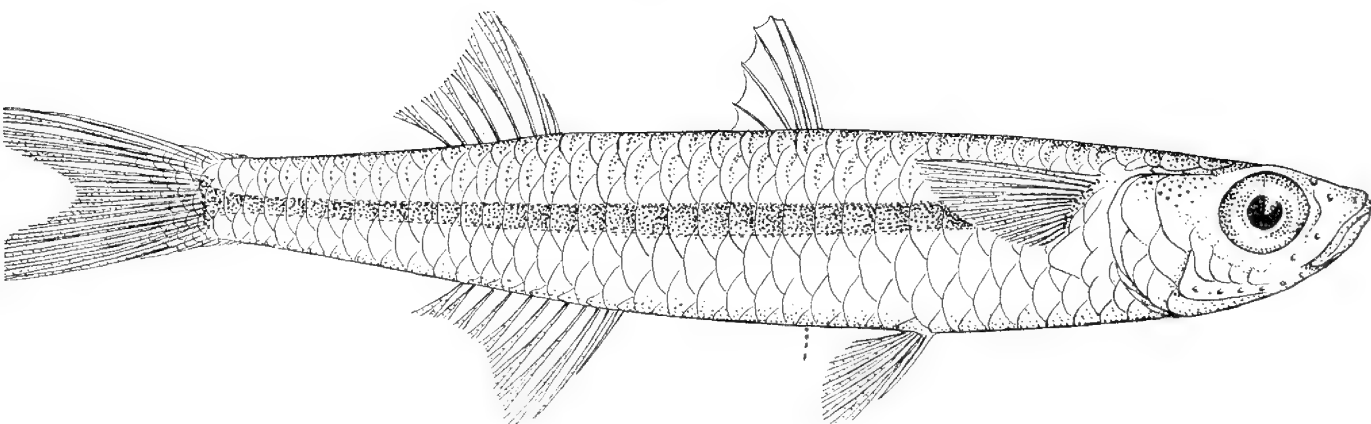
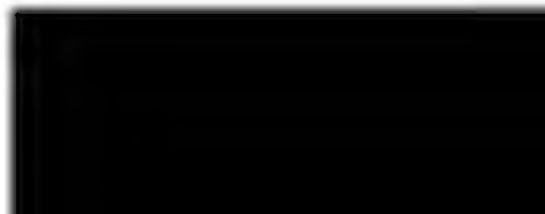


FIG. 3.

A. R. McCulloch, del.

FIG. 1.—*Atherina pinguis* Lacépède. Nat. size.
FIG. 2.—*Atherina lacunosa* Forster. x 2.
FIG. 3.—*Atherina honoræ* Ogilby. x 3.



D. v or vi, i 9 or 10; A. i 13 or 14; P. 16 to 19. Spinous dorsal originating above the 14th body-scale, its distance from the root of the caudal 1.16 to 1.25 in that from the tip of the snout; second spine usually a little longer than the first or third, 1.12 to 1.33 in the height of the soft dorsal, which originates above the 22nd body-scale. Caudal forked, with pointed lobes, the middle rays 1.79 to 2.06 in the upper lobe. Anal originating 3 scale-lengths in advance of and terminating on the same plane as the second dorsal, its base .21 to .35 more than its distance from the caudal and .4 to .6 more than that of the soft dorsal; last ray of both fins somewhat produced. Third and fourth pectoral rays longest, extending to the 8th or 9th body-scale. Ventral inserted a little behind the middle of the appressed pectoral, the space between its origin and the anal 1.31 to 1.53 in its distance from the tip of the mandible.

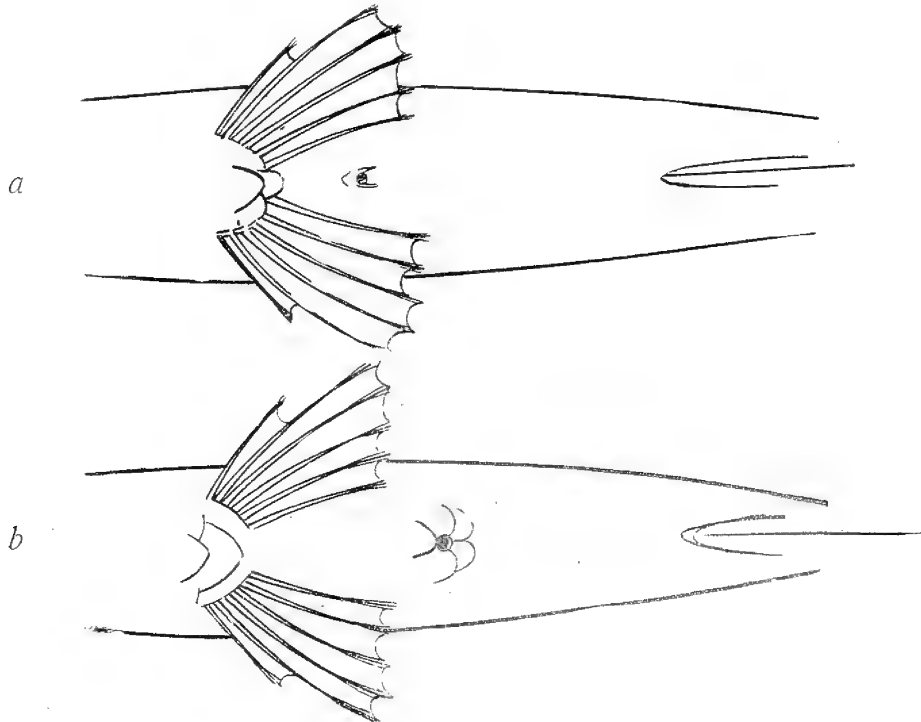
Gill-rakers 6 or 7 + 24 to 27, long and slender, the longest 2 to 2.5 in the eye-diameter and twice or rather less than twice the length of the gill-fringes. Pharyngeal dentition similar to that of *A. lacunosa*, but each separate tooth much longer and coarser. Vent situated about a pupil-diameter in advance of the tip of the ventrals, its distance from the origin of which is 1.81 to 2.18 in that from the anal. Vertebrae 21 + 20 or 21 = 41 or 42.

Upper parts pale green, each scale bordered and more or less dotted with black, the median dorsal with a terminal group of black dots so crowded together as to form a conspicuous spot; lower surfaces pearly white, with a single or irregularly double series of black dots just below the lateral line, one or more rows along each side of the base of the anal, a single row along the ventral ridge between the anal and caudal fins, and a few dots irregularly distributed over the sides of the trunk and tail; a silvery lateral band about half a scale-width separates the two areas, and covers the middle part of the third row of scales, extending from behind the base of the pectoral to the root of the caudal. Lips, upper surface of head, and parietal region profusely black-dotted, the dots being most densely crowded on the anterior edge of the snout, the ground color of which posteriorly is smoky brown; interorbital region wholly or in two supraciliary patches dark blue. Iris silvery, clouded above with blue. Vertical fins colorless, or with a series of black dots along the edge of the first dorsal spine and ray. Caudal narrowly, pectorals broadly black-tipped, due to the crowding together of numerous black dots; ventrals colorless. (*pinguis*, stout.)

Described from twelve Moreton Bay examples, measuring from 102 to 174 millim., the number being evenly divided between the Queensland and A.F.A.Q. Museums.

I am somewhat sceptical as to the specific identity of such a fish as this ranging from Madagascar to the New Hebrides and Fiji and from the Red Sea to New Zealand. It is more than likely that, as in the case of *Elops*, half a dozen species are being confounded under the name *pinguis*; as no other

Museum is likely to have so complete a geographical series of this fish as the British, we over here hope that Mr. Tate Regan will shortly make use of his opportunities to institute an exhaustive inquiry into the forms of this interesting little species, for even on the Australian coast the intertropical form differs more or less markedly from its southern brother.



(a) Ventral surface of *Atherina pinguis* Lacépède, showing position of vent.
 (b) Same view of *Atherina lacunosa* Forster, greatly enlarged.

ATHERINA LACUNOSA Forster.

Atherina lacunosa Forster, in Bloch & Schneider, Syst. Ichth., 1801, p. 112: New Caledonia—
 id., Deser. Anim., Lichstenstein ed., 1844, p. 298. Not of Valenciennes,¹ nor Bleeker,² nor
 Günther,³ nor Jordan & Richardson.⁴

Slender Hardihead.

Plate 12, fig. 2.

Depth of body 5·71 to 6·35, length of head 4·05 to 4·21, of caudal fin 5 to 5·19, of pectoral 5·1 to 5·4, of ventral 7·56 to 7·71 in length of body. Length of snout 3·86 to 4·1, diameter of eye 2·45 to 2·75, width of interorbit 2·59 to 2·82, length of maxillary 2·4 to 2·58, of mandible 2·25 to 2·5, height of spinous dorsal 2·24 to 2·6, of soft dorsal 2·14 to 2·6, of anal 1·87 to 2·2 in length of head.

¹ Hist. Nat. Poiss., x, 1835, p. 454: New Caledonia.

² Nat. Tijds. Nederl. Ind., v, 1853, p. 504: Sumatra.

³ Journ. Mus. Godeffr., Heft xiii, 1877, p. 213, pl. cxviii, fig. E: Vaté, New Hebrides; New Caledonia.

⁴ Bull. U.S. Bur. Fish., xxvii, 1907, p. 243: Iloilo, Philippines.

Body slender and subfusiform, its width 1.23 to 1.37 in its depth, which is 1.36 to 1.53 in the length of the head; caudal peduncle long and slender, its least depth 2.41 to 2.79 in its length and 1.38 to 1.62 in the eye-diameter. Width of head 1 to 1.11 in its depth, which is 1.67 to 1.73 in its length; snout short and broad, its length 1.4 to 1.62 in the eye-diameter, which equals or exceeds by one fifth the postorbital length of the head. Jaws equal; maxillary extending to or nearly to below the anterior border of the eye, mandible to below that of the pupil. Interorbital region flat, its width 1 to 1.09 in the eye-diameter; postorbital length of head 1.7 to 2.06 in the rest of the head. Posterior suborbital notch obsolete.

Scales 38 to 40¹/6. Predorsal scales 17 or 18; interdorsal 7 or 8; 5 scales between the origin of the soft dorsal and the anal; cheek-scales and interopercular scales in a single series each; no axillary pectoral scale; axillary scale of ventral sometimes wanting, its length, when present, 2.75 to 3 in the length of the fin and 2 to 2.12 in the eye-diameter.

D. v or vi, i 10; A. i 12; P. 17. Spinous dorsal originating above the 12th or 13th body-scale and midway between the root of the caudal and the tip of the snout or a trifle (less than one fifteenth) nearer to the former; second spine longest, as high as the soft dorsal, which originates above the 23rd or 24th body-scale. Caudal forked, with pointed lobes, the middle rays 1.8 to 2.04 in the upper lobe. Anal originating 2 scale-lengths in advance of and terminating on the same plane as the soft dorsal, its base as long as its distance from the caudal and .37 to .47 more than that of the soft dorsal; last ray of both fins somewhat produced. Fourth and fifth pectoral rays longest, extending to the 8th body-scale. Ventral inserted below the last quarter of the appressed pectoral, the space between its origin and the anal 1.25 to 1.41 in its distance from the tip of the mandible.

Gill-rakers 6 + 22 or 23, rather short and slender, the longest 4.5 to 5 in the eye-diameter and about as long as the gill-fringes. Upper pharyngeal bones armed with numerous close-set conical slightly curved teeth; lower with longer and more slender erect teeth. Vent immediately behind the tips of the ventrals in young to nearly a pupil-diameter behind in adult examples and midway between the origins of the ventrals and anal. Vertebrae 19 + 21 = 40.

Coloration as in *A. pinguis* (See p. 39). (*lacunosa*, full of pits; alluding to the large open pores of the muciferous system.)

Described from five specimens, measuring from 63 to 107 millimeters, obtained at Bulwer, Moreton Bay, by Mr. James Palmer, and kindly forwarded by him to the A.F.A.Q. Museum. One of these specimens being somewhat

¹ From behind the pectoral to the root of the caudal.

damaged was utilized for dissection; a second is in the possession of Dr. William Patten, Professor of Biology, Dartmouth College, Hanover, New Hampshire; a third has been presented to the Australian Museum, Sydney; a fourth is in the Queensland Museum, Reg. No. I. 448; and the last has been retained by the A.F.A.Q., Cat. No. 1700.

ATHERINA HONORIÆ sp. nov.

Estuarine Hardihead.

Plate 12, fig. 3.

Depth of body 6.12 to 6.25, length of head 4.13 to 4.33, of caudal fin 4.88 to 5.05, of pectoral 5.62 to 5.78, of ventral 7.66 to 8 in length of body. Length of snout 3.43 to 3.6, diameter of eye 2.7 to 2.86, width of interorbit 3.4 to 3.6; length of maxillary 2.9, of mandible 2.45 to 2.5, height of spinous dorsal 2.16, of soft dorsal 1.66 to 1.85, of anal 1.6 to 1.75 in length of head.

Body slender and somewhat compressed, its width 1.42 to 1.5 in its depth, which is 1.4 to 1.5 in the length of the head; caudal peduncle long and slender, its least depth 2.83 to 3 in its length and 1.15 to 1.33 in the eye-diameter. Width of head 1.08 to 1.13 in its depth, which is 1.67 in its length. Snout moderate and pointed, its length 1.2 to 1.33 in the eye-diameter, which is equal to or rather less than the postorbital portion of the head. Jaws subequal, mouth small, with strongly oblique cleft, the maxillary not extending to the level of the eye, the mandible to below the anterior border of the pupil. Interorbital region flat, its width 1.27 to 1.33 in the eye-diameter; postorbital length of head 1.5 to 1.66 in the rest of the head. No suborbital notch.

Scales 32 to 34/6. Predorsal scales 13 or 14; interdorsal 6; 5 scales between the origin of the soft dorsal and the anal; cheek-scales and interopercular scales in a single series each; no axillary pectoral scale; axillary scale of ventral short and triangular, its length 3.16 to 3.34 in that of the fin and 2.1 to 2.18 in the eye-diameter.

D. v, i 7 or 8; A. i 10; P. 13. Spinous dorsal originating above the 10th body-scale and nearer to the tip of the snout than to the root of the caudal; second spine longest, 1.12 to 1.28 in the height of the soft dorsal, which originates above the 18th body-scale. Caudal fin forked, with pointed lobes, the middle rays 1.9 to 2.15 in the upper lobe. Anal originating 3 scale-lengths in advance of and terminating slightly before the last ray of the soft dorsal, its base 1.25 to 1.4 in its distance from the caudal and .41 to .48 more than that of the soft dorsal; last ray of both fins slightly produced. Third pectoral ray the longest, extending to the 7th body-scale. Ventral inserted below the last quarter of the appressed pectoral, the space between its origin and the anal 1.5 to 1.62 in its distance from the tip of the mandible.

Gill-rakers $5 + 12$, rather short and stout, the longest about one fourth of the diameter of the eye and a little longer than the gill-fringes. Upper and lower pharyngeal bones clothed with close-set acicular teeth, the former with one or two rows of coarse conical teeth posteriorly. Vent between the tips of the ventrals and midway between the origins of the ventrals and anal. Vertebrae $21 + 20 = 41$.

Coloration after ten years' immersion in formalin solution—Yellow, clear above dull below; each scale of the median dorsal line with two or more black spots and numerous brown dots, the latter present on the other dorsal scales, mostly as a diminishing marginal band; a broad violet band along the middle of the side from above the base of the pectoral to the root of the caudal; all the scales below this band immaculate, except those along the median ventral line, which are black-dotted. Snout powdered with brown; a large blackish occipital blotch. Fins immaculate. Dedicated to Miss Honor Coralie Hamlyn-Harris.

Described from two specimens, measuring respectively 64 (type) and 78 millim., collected in Nerang Creek by Mr. J. R. Tosh in 1902; they are in the collection of the Queensland Museum.

TRACHICHTHYIDÆ.

PARATRACHICHTHYS ELONGATUS (Günther).

The Queensland Museum possesses a specimen of this fish labeled Moreton Bay; this was one of the discoveries of Mr. E. Marwedel during his memorable trawling experiments in 1889.

BOTHIDÆ.

With the addition of the two species here described we are now acquainted with seven founders of the genus *Pseudorhombus* inhabiting Queensland waters, as against but one catalogued by Macleay up to 1884 and a second recorded by Saville Kent in 1893.

Our list now contains the following forms:—

1. *russellii* Gray, in Gray and Hardwicke Ind. Zool., 1830, pl. —, fig. 2—Large-toothed Flounder.¹
2. *polyspilos* Bleeker, Nat. Tijds. Ned. Ind., iv, 1853, p. 503—Starry Flounder.
3. *novæ-cambiæ* Ogilby, Proc. Linn. Soc. N.S. Wales, xxiii, 1898, p. 296—Common Flounder.
4. *tenuirastrum* Waite, Mem. Austr. Mus., iv, 1899, p. 121—Slender Flounder.
5. *elevatus* Ogilby, infra.—Deep Flounder.

¹ I have not seen this species and doubt its occurrence.

6. *cartwrighti* Ogilby, infra.—Cartwright's Flounder.
7. *anomalus* Ogilby, infra.—Ocellated Flounder.
8. sp.—Twin-spot Flounder. Of this latter species, according to my notes, seven specimens were obtained during the Endeavour's second cruise in Queensland waters, two off Pine Peak in 25 fathoms on mud and five off Cape Gloucester in 36 fathoms on sand and mud. Owing to the tardy way in which these collections are unavoidably being worked out it may be years before we can authoritatively include this and many other interesting fishes in the Queensland Catalogue. This flounder may be *Pseudorhombus dupliciocellatus* Regan¹ from the Inland Sea of Japan.

In the same notes reference is briefly made to two other flounders which may belong to this genus; of the first of these four specimens are noted, under the heading "Small-mouthed Flounder," as having been trawled in 15 fathoms on sand and shell off Hummocky Island, and it is specially mentioned that the maxillary does not reach the eye; of the second two examples are recorded from 24 fathoms on fine sand off Cartwright Point; it is noted as the "Yellow Flounder" and as being destitute of ocelli or spots of any kind.

But few of these valuable food-fishes find their way to the tables of our consumers owing to the inefficient means of capture at our command, since it is not often that they approach so closely to the shore as to come within the scope of the seine-net, and the only others that are taken are the accidental captives of hook and line, mostly the spoil of the amateur angler. That, however, with the introduction of proper appliances—the more important of which would be the trawl-net and the boulder—our market supply of these delicious fishes might be materially increased, is evident from the fact that the number of specimens captured, during the necessarily sporadic and tentative operations of the Endeavour when on our coast, closely approached 500, most of which were in good condition and of marketable size. It is therefore quite within the bounds of probability that the day may not be far distant when the flounder and the sole may occupy their proper place on the daily bill of fare.

There is often considerable difficulty in distinguishing from outside characters alone the species of this genus, the one from the other, the general pattern of coloration being very similar in all; in some cases of course, such as that of our "twin-spot flounder"—much the handsomest of our species—this is unmistakable. The grouping of the larger ocellated spots gives some guidance, but I have not sufficient examples on hand to determine definitely whether this character be dependable. Of purely structural characters, in addition to the dentition, the relative depth of the body and the size of the gape—as shown by the length of the maxillary—may afford valuable assistance, but according

¹ Ann. & Mag. Nat. Hist. (7) xv, 1905, p. 25.

to my experience the form and number of the gill-rakers provides the most reliable character for the separation of our species, as they differ to an extraordinary degree *inter se*. This fact was first noted by the author (*loc. cit.*) when comparing the gill-rakers of his *P. novæ-cambiæ* with those of *P. multimaculatus* as described by Günther, and was afterwards made good use of by Waite in diagnosing his *P. tenuistratum*.

SYNOPSIS OF THE PSEUDORHOMBI OF MORETON BAY.

- a*¹. Scales of eyed side ctenoid, of blind side cycloid.
- b*¹. No enlarged teeth in either jaw; depth of body 1.83, length of head 3.55 in length of body; depth of peduncle 5.33 in that of body; scales in 66 transverse series; D. 71; A. 54; gill-rakers rather long and slender, 14 on lower branch of anterior arch 1. *elevatus*.
- c*¹. Enlarged teeth present in both jaws.
- d*¹. Depth of body about 1.95, length of head about 3.6 in length of body; depth of peduncle 4.75 in that of body; scales in about 85 transverse series; D. 71 or 72; A. 54 to 56 2. *russellii*.¹
- d*². Depth of body 2.02 to 2.28, length of head 3.22 to 3.42 in length of body; depth of peduncle 4.15 in that of body; scales in about 76 transverse series; D. 73 to 77; A. 56 to 59 3. *polyspilos*.
- c*². No enlarged teeth in either jaw.
- e*¹. Length of head 3.5 in that of body; depth of peduncle 3.9 in that of body; scales in about 71 transverse series; D. 67 to 70; A. 50 to 55; gill-rakers short and broad, 7 to 9 on lower branch of anterior arch 4. *novæ-cambiæ*.
- e*². Length of head 3.3 in that of body; depth of peduncle 4.7 in that of body; scales in 82 transverse series; D. 75; A. 63; gill-rakers shorter and broader, 10 on lower branch of anterior arch 5. *cartwrighti*.
- e*³. Length of head 3.4 in that of body; depth of peduncle 3.7 in that of body; scales in 84 transverse series; D. 64; A. 53; gill-rakers rather long and slender, 10 on lower branch of anterior arch 6. *anomalus*.
- a*². Scales cycloid on both sides; no enlarged teeth on either jaw; depth of body 2.2 to 2.4, length of head 4.25 in length of body; depth of peduncle 3.65 to 4 in that of body; scales in 76² transverse series; D. 75 or 76; A. 60 or 61; gill-rakers rather long and slender, 12 on the lower branch of the anterior arch 7. *tenuistratum*.

PSEUDORHOMBUS ELEVATUS sp. nov.

Deep Flounder.

Depth of body 1.83, length of head 3.55, of caudal fin 4.68 in length of body. Length of snout 3.37, diameter of eye 3.88, length of maxillary 2, of mandible 1.81, of left pectoral 1.44, of left ventral 2.43 in length of head.

¹ *Fide* Bleeker.² Waite counts 91.

Body ovate, its dorsal contour more elevated than that of our other species, so that the rostro-caudal line passes well below the lateral line; profile of head and nape from in front of the upper eye evenly and rather strongly convex, of mandible anteriorly truncate and vertical, inferiorly linear and declivous; caudal peduncle short, its depth 5.33 in that of the body. Snout a little shorter than the eye, its profile subvertical in front, bent sharply backwards above, the rostro-frontal notch deep; mental knob well developed and acute, as also is the articular. Mouth strongly arched, the jaws equal; maxillary extending to below the middle of the eye, its distal border truncate or feebly undulous, with a distinctly backward slope, its width 1.42 in the eye-diameter. Eyes on the same vertical plane; interorbital region reduced to a narrow sharp elevated ridge, rising to slightly above the level of the eye. None of the teeth enlarged; shaft of vomer with two large conical tooth-like processes, the posterior the larger.

Scales in 66 transverse series above the lateral line, those of the colored side ciliated, of the blind cycloid; maxillary scaly; a row of scales along each of the vertical fin-rays, except a few anteriorly and posteriorly. Depth of lateral line curve 2.74 in its length and 1.1 time the eye-diameter; the nuchal branch extending to the base of the seventh dorsal ray.

D. 71; A. 54; C. 15; P. 12/11; V. 6.

Dorsal originating on the blind side in front of the upper eye, the anterior rays only connected at the base, those of the anal similarly free. Caudal subcuneate. Left pectoral with oblique base, the upper middle rays the longest, reaching slightly beyond the curve of the lateral line, its insertion on the same plane as that of the right pectoral, the length of which is but 1.65 in that of the left. Ventrals well developed, that of the colored side inserted rather nearer to the abdominal ridge and notably anterior to the right fin, with which it is subequal in length, and which reaches to the first anal ray.

Gill-rakers of moderate length and slender, fully denticulated, 14 on the lower branch of the anterior arch.

Upper surface sandy brown with a large dark spot behind the angle of the lateral line and five series of inconspicuous ocelli, two above one on and two below the lateral line. Iris blue above, silvery below. Vertical fins with rather faint dark spots at intervals of about eight rays; caudal with some small spots distally and an upper and lower ocellus mesially; pectoral and ventral fins immaculate (*elevatus*, raised up: in reference to the height of the dorsal profile).

Described from a specimen, 142 millim. long, taken at Bulwer, Moreton Bay, by Mr. James Palmer, and presented by him to the A.F.A.Q. Museum. Cat. No. 1713.

At first I had hopes that this species would prove to be the missing *Pseudorhombus multimaculatus* Günther,¹ with which it agrees in the exceptional depth of the body, the shape of the interorbital region, the form and length of the gill-rakers, etc., but the remaining characters seem to show conclusively that my hopes were futile, and that Günther's species, if Australian, remains as heretofore a desiderate in all the Museums of the Commonwealth.

PSEUDORHOMBUS CARTWRIGHTI sp. nov.

Cartwright's Flounder.

Depth of body 2.08, length of head 3.31, of caudal fin 5.17 in length of body. Length of snout 4.41, diameter of eye 6.25, length of maxillary 2.14, of mandible 1.9, of left pectoral 1.87, of left ventral 3.12 in length of head.

Body ovate, its anterior upper profile gently rounded and but moderately declivous, the dorsal contour so little elevated that the rostro-dorsal line passes almost directly along the middle of the side; caudal peduncle short, its depth 4.7 in that of the body. Snout long, 1.42 time the eye-diameter, its profile obtusely angulated in front of the upper eye, the rostro-frontal notch conspicuous; profile of mandible anteriorly truncate and vertical, inferiorly linear and rather strongly declivous, with a slight concavity behind the mental knob, which is well developed and somewhat obtuse, as also is the articular knob. Mouth moderately arched, the jaws subequal; maxillary extending to below the middle of the eye, its distal border feebly convex and sloping well backwards, its width but little less than the eye-diameter; mandible reaching slightly beyond the maxillary. Lower eye slightly in advance of the upper, its diameter 1.5 in the length of the snout; interorbital region reduced to a narrow naked sharp ridge, which rises well above the level of the eye. None of the teeth enlarged.

Scales in 82 transverse series above the lateral line, those of the colored side smooth and ciliated, of the blind side cycloid; posterior half of left maxillary scaly; a row of scales along each of the vertical fin-rays, except some of the anterior and posterior ones. Depth of lateral line curve 2.69 in its length and 1.27 time the eye-diameter, the nuchal branch extending to the base of the ninth ray.

D. 75; A. 63; C. 15; P. 11; V. 6.

Dorsal originating on the blind side of the rostro-frontal notch. Caudal subcuneate. Left pectoral with slightly oblique base, the upper rays longest, just reaching the straight part of the lateral line, its insertion slightly higher than that of the right pectoral, the length of which is 1.29 in that of the left. Ventrals well developed, that of the colored side inserted rather nearer to the abdominal ridge and a little anterior to the right fin, which is slightly the longer and reaches to the third anal ray.

¹ Brit. Mus. Catal. Fish., iv, 1862, p. 427.

Gill-rakers very short broad and strongly compressed, the tips denticulated, 10 on the lower branch of the anterior arch.

Lavender gray, tinged with pale brown, most of the scales with narrow darker edges; body with numerous dark ovate annuli of variable size; six of these are larger than the others and than the eye-diameter; included within them are a pair of still darker spots, usually with a whitish centre and numerous smaller gray spots; these annuli are fairly constant in position and are arranged in pairs; the upper of the anterior pair is situated in the angle formed by the curved and straight portions of the lateral line, the lower below and behind the end of the pectoral; the second pair are similarly transverse in position and are situated somewhat nearer to the head than to the caudal fin; the third pair are smaller and are placed horizontally on the lateral line; the remaining annuli are much smaller and are irregularly distributed. Head paler than the body and with a few still smaller annuli and ocelli, the snout and lips yellowish gray freckled with pale brown; edge of premaxillary darker brown. Vertical fins closely speckled with pale brown and with a few scattered ocelli; a transversely arranged pair near the base of the caudal; left pectorals and ventrals with numerous small light brown spots.

Described from a fine specimen, 296 millim. long, purchased in the Brisbane Market from a basket of fishes seined in Moreton Bay during September, 1911; Cat. No. 1647.

I have much pleasure in dedicating this fine flounder to my friend Capt. George H. Cartwright, late of the F.I.V. Endeavour, to whose untiring zeal and energy and excellent seamanship all such success as that vessel achieved during her sojourn in Queensland waters is wholly due.

PSEUDORHOMBUS ANOMALUS sp. nov.

Ocellated Flounder.

Depth of body 2.15, length of head 3.41, of caudal fin 4.64 in length of body. Length of snout 4.15, diameter of eye 5, length of maxillary 2.43, of mandible 1.94, of left pectoral 1.6, of left ventral 2.31 in length of head.

Body ovate, the contour of the nape very feebly convex, of the mandible linear, rather strongly oblique anteriorly, much less so inferiorly; caudal peduncle short, its depth 3.72 in that of the body. Snout gibbous above, the rostro-frontal notch well developed; mental knob small. Mouth strongly arched, the lower jaw the longer; maxillary extending to below the middle of the eye, its distal border truncate with a strong backward slope, its width 1.51 in the eye-diameter. Lower eye conspicuously more anterior than the upper, the diameter of which is 1.21 in the length of the snout; interorbital ridge sharp, but low and not rising to the level of the eye. None of the teeth enlarged.

Scales in 84 transverse series above the lateral line, those of the colored side ciliated, of the blind cycloid; left maxillary with three minute scales superiorly on the dilated portion, the right naked; dorsal and anal fins without interradiial rows of scales. Depth of lateral line curve 2.3 in its length and 1.1 in the eye-diameter; nuchal branch extending to the base of the eighth dorsal ray.

D. 64; A. 53; C. 15; P. 12/12; V. 6/6.

Dorsal originating on the blind side in front of the outer border of the upper eye, the tips of the anterior rays free for more than half their length, those of the anal similarly but not so extensively free. Caudal fin broadly rounded. Left pectoral with oblique base, the upper middle rays the longest, reaching five eighths of an eye-diameter beyond the curve of the lateral line, its insertion much higher than that of the right pectoral, the length of which is 1.42 in that of the left. Ventrals well developed, that of the colored side inserted much nearer to the abdominal ridge, but on the same plane as the right fin, which is a little the shorter and reaches to the second anal ray.

Gill-rakers rather long and slender, smooth except the anterior three on the lower limb, which are sublaviform and feebly serrulate distally; 10 on the lower branch of the anterior arch, the longest 2.3 in the eye-diameter. Vent opening on the summit of a conspicuous papilla on the blind side immediately in advance of the anal.

Chocolate-brown, the body profusely ornamented with round and oval black annuli, irregularly disposed and variable in size, but all containing a more or less central black spot, which corresponds in size to that of the enclosing ring. Head with a few black spots, but without annuli. Vertical fins flecked and speckled with black (*anomalus*; deviating from the normal habit of the genus).

Described from a Moreton Bay specimen, measuring 142 millim. Catalogue number 1908.

LOPHONECTES GALLUS Günther.¹

While searching for suitable examples of fishes for exhibition in the Queensland Museum, I had occasion to examine the contents of a bottle containing a number of small *Pseudorhombi* from Moreton Bay. Among these I found a rather dilapidated specimen of this southern fish. Its presence on the Queensland Coast had however been previously known to me, since 12 examples had been trawled in 13 fathoms off South Hill in the course of the last haul made by the Endeavour on 6th September, 1910.

¹ Zool. Challenger, i, 1880, Shore Fish., p. 28.

CHEILODIPTERIDÆ.

AMIA BERTHÆ Ogilby.¹

In the Leftwich collection above referred to (*v. p.* 21) a second specimen of this beautiful "percelle" occurs, and is noteworthy in that it increases the recorded range of the species from Dunk Island southward to Wide Bay. The example has been deposited in the State Museum.

SERRANIDÆ.

EPINEPHELUS FLAVOCERULEUS (Lacépède).²

The fish described by De Vis as *Homalogrystes luctuosus*³ is identical with the above.

EPINEPHELUS HOEDTII Bleeker.⁴

This handsome "rock cod" occurs sporadically in Moreton Bay, but always of large size, the smallest which I have had the opportunity of measuring being 32 inches long, while one which I saw in the Brisbane Market could not have been less than four feet. During the last week in May 1907 several specimens of this fish were noticeable in the Brisbane shops on account of their large size and conspicuous appearance. From that date none were in evidence until the winter of 1910, when a few examples appeared in the shops; since then it has not reappeared. From these data it may be inferred that it is only an occasional visitor to our shores during the winter months.

KYPHOSIDÆ.

KYPHOSUS GIBSONI *sp. nov.***Banded Drummer.**

Depth of body 2.33, length of head 4.2, of caudal fin 3.65, of pectoral 6.25, of ventral 6.5 in length of body. Length of snout 3.05, diameter of eye 3.9, width of interorbit 2.1, longest dorsal spine 2.15, longest anal 3.9 in length of head.

Body deeply ovate, the dorsal contour rather more arched than the ventral; caudal peduncle one third longer than deep, its least depth 4.25 in the depth of the body. Upper profile of head sublinear and moderately declivous, the snout anteriorly convex and strongly declivous. Diameter of eye 1.3 in

¹ Ann. Queensl. Mus., pt. 10, 1911, p. 47, pl. v, fig. 1.

² Hist. Nat. Poiss., iv, 1802, p. 367.

³ Proc. Linn. Soc. N.S. Wales, vii, 1882, p. 369.

⁴ Nat. Tijds. Nederl. Ind., viii, 1855, p. 406: Amboina—id., Atlas Ichth., vii, 1876, p. 45, pl., cclxxxii, fig. 2.

the length of the snout, 1.1 in the depth of the cheek below it, and 1.85 in the strongly convex interorbital width; lower jaw included; maxillary extending to below the anterior border of the eye, the width of its distal extremity 2.66 in its length. Incisors strong, $\frac{12-12}{10-10}$; tongue smooth. Preopercle and supra-scapula feebly serrated.

Scales, $12 \frac{7.5}{6.8} 21$; L.l. 54. Cheek-scales in 8, opercular in 11 series; preorbital and maxillary scaly.

D. xi 13; A. iii 12; P 18.

Soft dorsal rather longer than the spinous; dorsal spines rather weak, increasing in length to the seventh, the last a little longer than the fourth and about as long as the subequal soft rays. Caudal lunate. Anal originating below the third dorsal ray, its length equal to the soft portion of the dorsal; third spine longest, half the length of the anterior rays, which are 1.55 time that of the last rays and somewhat higher than the spinous dorsal. Pectoral pointed, inserted rather more horizontally than vertically, scarcely extending backward beyond the vertical from the axil of the ventral. Ventral inserted well behind and a little shorter than the pectoral, the first ray longest, reaching midway between its origin and the base of the third anal spine.

Gill-rakers much shorter than the gill-fringes, 21 on the lower branch of the anterior arch, mostly with but a slight downward gradation from the angle, the longest half of the eye-diameter.

Upper surface plumbeous, each of the scales with a narrow lighter border, which posteriorly dilates to form a silvery spot; on the sides the lighter shade predominates, leaving only a darker border to each scale, even this on the abdominal region being nearly, on the pectoral and thoracic wholly lost, these latter regions being uniform lavender with a mesial stripe of dull white; sides with 8 bronze-gold bands, about a third of a scale in width, and confined to the upper and lower edges of the mid-lateral series of scales. Checks and opercles violaceous, crossed by two broad bronze-gold bands, the upper from the eye to the opercle, the lower from behind the angle of the mouth to the preopercle; lower lip and chin lavender with a blackish border. Iris purple, with a broad upper golden and lower silvery outer edge. Spinous dorsal violet; soft dorsal, anal, and caudal plumbeous, the lobes of the latter lighter; pectorals blue-gray, with a broad lighter terminal border; ventrals violet.

Type in the Queensland Museum: Cat. No. I. 11/30.

Described from a specimen, 431 millim. long, taken in Moreton Bay by Mr. W. Gibson, to whom I have much pleasure in dedicating the species.

This species differs from *K. sydneyanus*¹ in the number of soft dorsal and anal rays, the scale formula, the deeper body and longer head, etc., but, except in coloration, the differences between it and *K. meridionalis*² are not nearly so marked; it may be, therefore, that two species occur on the New South Wales Coast and have been confused together, in which case this fish should perhaps be called *Kyphosus meridionalis*; the figure given by me³ is as high or higher than the Moreton Bay specimen. Its nearest ally appears to be *K. lembus*.⁴

SPARIDÆ.

LETHRINUS LATICAUDIS Alleyne & Macleay.

Lethrinus laticaudis Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales, i, 1877, p. 276, pl. viii, fig. 2: Percy Islands.

Gibbous-fronted Emperor.

Depth of body 2 to 2·2, length of head 2·5 to 2·8, of caudal fin 3·5, of pectoral 2·8, of ventral 3·15 to 3·3 in length of body. Length of snout 1·75, diameter of eye 3·85, width of interorbit 4 to 4·2, depth of preorbital 2·6 to 2·66, length of maxillary 2·75 to 3, of mandible 2·25, longest dorsal spine 2·5 to 2·65, longest anal 2·8 in length of head.

Body elevated, the dorsal contour strongly arched, its depth about one fifth more than the length of the head, caudal peduncle a little longer than deep, its least depth 3 in the depth of the body. Head rather longer than deep, its upper profile from above the posterior nostril linear and moderately acclivous, the nape convex; snout obtusely pointed, with concave anterior profile, the internasal region conspicuously swollen; eye large, its diameter 2·2 in the length of the snout and 1·5 in the depth of the preorbital; interorbital region feebly convex, its width a little less than the eye-diameter. Jaws equal; maxillary not extending to the vertical from the anterior border of the eye. Canines moderate; the 4 posterior lateral teeth with rounded crowns. Hinder limb of preopercle subvertical, with a feeble backward inclination; opercle with a spinous point.

Scales 5/45 or 46/16. Postocular region with 2, parietal with 1 or 2 series of scales; lateral line rather strongly curved downwards below the middle of the soft dorsal; 1 or 2 tubular scales on the base of the caudal.

D. x 9; A. iii 8; P. 13.

Dorsal spines strong, the first 1·33 to 1·45 in the second and 1·85 to 2·33 in the fourth and fifth, which are the longest; last spine longer than the penultimate; soft portion of dorsal higher than long, rounded behind, the fourth ray

¹ *Pimblepterus sydneyanus* Günther, Ann. & Mag. Nat. Hist. (5) xviii, 1886, p. 368.

² *Pimblepterus meridionalis* Ogilby, Proc. Zool. Soc., 1886, p. 539.

³ Ogilby, Edib. Fish. & Crust. N.S. Wales, pl. xvi.

⁴ *Pimblepterus lembus* Cuvier & Valenciennes, Hist. Nat. Poiss., vii, 1831, p. 269: Vanicolo.

longest, not much longer than the fifth, and 1.33 to 1.45 time the longest spine. Caudal emarginate, with broadly rounded lobes, the middle rays about 1.5 in the upper lobe. Anal originating below the last (or penultimate) dorsal spine, rounded posteriorly, the third spine longest, 1.33 in the second and longest ray, which equals the length of the fin and is somewhat lower than the soft dorsal. Pectoral pointed, a little shorter than the head, the second ray much the strongest but not so long as the third and fourth, which extend to the vertical from the third anal ray. Ventral inserted mostly behind the pectoral, the spine rather weak, half or rather more than half as long as the first ray, which is more or less produced and extends to the third spine or second ray of the anal.

Brown or purplish brown above shading into pearl gray or lavender below, each of the upper scales with a darker, of the lower with a lighter median spot. Naked portion of head fulvous. Fins hyaline, except the naked part of the caudal, the proximal half of which is purple.

Length of body 235 millim.

Coast of Queensland north from the Percy Islands.

Described from two specimens, measuring 266 and 302 millim., collected by the late Mr. Kendal Broadbent at Cape York and Murray Island respectively.

I do not think there can be any doubt of the identity of these two specimens with that of Alleyne and Macleay, notwithstanding that there are two grave discrepancies between our respective descriptions—namely, in the type specimen (now in the Macleay Museum, Sydney University) the head is said to “four times in the total length” and the diameter of orbit “much less than the distance between the eyes.” With regard to the former character the exact length of the head to the total length in my specimens is as 1 to 3.24 and 1 to 3.28, while in Macleay’s plate it is as 1 to 3.6, which figures greatly reduce the discrepancy. Verification of second controversial character can only be made from an examination of the type.

The species is very closely allied to *Lethrinus hypselopterus* Bleeker.¹

The specimens are in the collection of the Queensland Museum. Cat. No. I. 11/33.²

¹ Ned. Tijds. Dierk., iv, p. 326.

² Since writing the above Mr. McCulloch has kindly examined the type of *L. laticaudis*, and advises me that the true measurements of the head are as follow—“length of head 2.8 in that of body, 3.4 in that of the end of the middle caudal rays, and 3.5 in the total length.” He also states that “the bony interorbital width equals the bony orbit, is a little wider than the actual eye-opening,” and that “the preorbital is 2.66 in the head.” These corrections bring my specimens within measurable distance of *L. laticaudis*, with which I therefore identify them.

CHÆTODONTIDÆ.

CHÆTODON FALCULA Bloch.¹

The species described by De Vis as *Chatodon aurora*² is identical with the above.

CHÆTODON CITRINELLUS Cuvier & Valenciennes.³

Chatodon nigripes De Vis⁴ can not be separated from this species.

CHÆTODON PELEWENSIS Kner.⁵

Antedates *Chatodon germanus* De Vis.⁶

HOLACANTHUS CYANOTIS Günther.⁷

Holacanthus spynx De Vis⁸ only differs from the above in the absence of the blue markings; I do not think they can be separated specifically on such slight grounds.

All four of these types have been mounted and are now in a most wretched condition.

FAMILY SIGANIDÆ.

SIGANUS CONSOBRINUS sp. nov.

Teuthis albopunctatus Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales, i, 1877, p. 338: Cape Grenville—Macleay, *ibid.*, v, 1881, p. 443. After Günther—Saville-Kent, Great Barrier Reef, 1893, p. 286. Not *Amphacanthus albopunctatus* Schlegel 1845.

Queensland Spine-Foot.⁹

Plate 13.

Depth of body 2.64 to 2.75,¹⁰ length of head 4.1 to 4.22, of caudal fin 3.85 to 4.04, of pectoral 5.21 to 5.28, of ventral 7.44 to 7.6 in length of body. Length of snout 2.23 to 2.38, diameter of eye 3.67 to 3.87, width of interorbit 3.39 to 3.58, of preorbital posteriorly 6.96 to 7.28, depth of cheek 4 to 4.4, longest dorsal spine 1.62 to 1.83, longest anal 2.02 to 2.1 in length of head.

¹ *Ausl. Fisch.*, x, 1797, p. 102.

² *Proc. Linn. Soc. N.S. Wales*, ix, 1884, p. 453.

³ *Hist. Nat. Poiss.*, vii, 1831, p. 27.

⁴ *Ibid.*

⁵ *Sitzb. Akad. Wien*, lviii, 1868, p. 306.

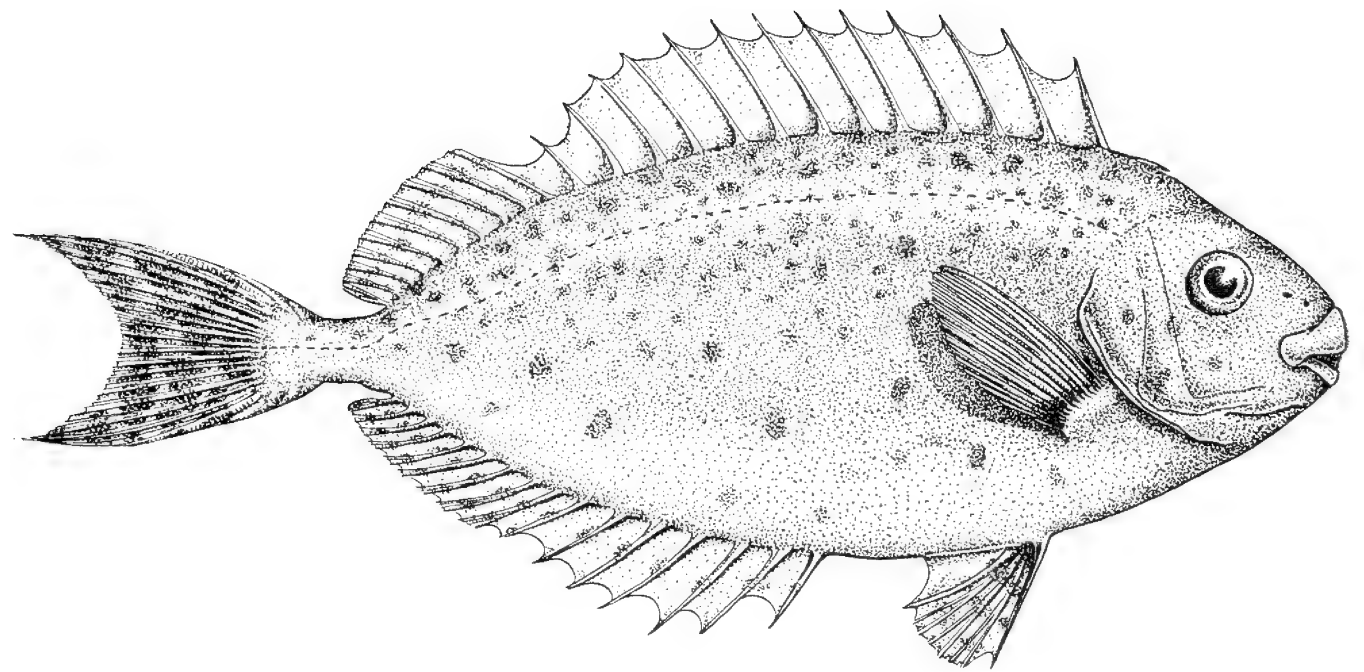
⁶ *Ibid.*, p. 454.

⁷ *Brit. Mus. Catal. Fish.*, ii, 1860, p. 517.

⁸ *Ibid.*, p. 457.

⁹ In my recent list of the "Edible Fishes of Moreton Bay and its Affluents" (*see Rep. Mar. Dept. Queensl.*, 1911, App. 7, p. 15), published with a view to systematizing the popular names of our fishes and bringing into existence some kind of uniformity in this respect among the different States of the Commonwealth, I gave to this fish the common market name of "Butter Fish"—so called because of its smooth slippery skin—, but as that name is given to several distinct species of fishes in the older States, it is necessary to adopt a new appellation, suitable to all the fishes of the family, and I therefore propose the above name—*Siganidæ*, The Spine-Foots—as being both distinctive and appropriate, and not elsewhere employed so far as I am aware.

¹⁰ Depth of body 3.3 to 3.42 in total length.



D. B. Fry, del.

Siganus consobrinus Ozilby. Drawn from type : $\frac{1}{4}$ reduction.

Face page 54.



Body subovate, its depth about 1.54 time the length of the head; mesial length of caudal peduncle equal to or rather more than the length of the snout. Fronto-occipital profile feebly concave; profile of snout feebly concave and moderately declivous, the fronto-nasal gibbosity conspicuous. Upper lip wide, the upper lateral edges concave, its symphysial length 1.26 to 1.41 in the eye-diameter. Eye small, situated well below the cephalic profile, its diameter 1.58 to 1.65 in the length of the snout; a low rough ridge ending in a small spine above the antero-superior angle of the eye; interorbital region mesially flat, its width a trifle less than the eye-diameter and 1.67 to 1.81 time the space between the eye and the closed maxillary. Maxillary extending to or nearly to below the posterior nostril, its distal width 3.2 to 3.45 in the length of the snout. Nostrils on a level with the upper half of the pupil, the internasal space less than that between the posterior nostril and the eye, which equals the distance of the anterior nostril from the edge of the preorbital. Opercle with a few feeble subvertical striæ.

D. i + xiii 10; A. vii 9; P. 16; V. i 3 i.

Spinous dorsal fin with rounded outline, the last spine 1.95 to 2.25 in the sixth and longest; soft dorsal rounded, the second and third rays longest, 1.12 to 1.33 in the longest spine, its base 2.65 to 2.82 in that of the spinous portion. Caudal deeply emarginate, with pointed lobes, the upper sometimes the longer, twice or more than twice as long as the middle rays. Anal originating a little nearer to the tip of the snout than to the base of the caudal; third spine longest, .31 to .44 more than the longest ray; base of soft anal 1.3 to 1.35 in that of the spinous, its height much less than that of the soft dorsal. Pectoral pointed, its length 1.24 to 1.37 in the head. Ventral inserted, well behind the pectoral, the space between its origin and the anal 1.6 to 1.68 in its distance from the tip of the snout, that between its tip and the anal 2.54 to 2.62 in its length.

Vent nearer to the origin of the ventral than to that of the anal.

Olive- or chocolate-brown, darkest above, with some irregular lighter blotches; back and sides with numerous small close-set light blue spots, which are as wide or slightly narrower than the interspaces; entire body, or more usually its lower half only, with much larger scattered dark brown or blackish spots; a round blackish shoulder spot about as large as the eye usually present. Upper surface of head dark brown blotched with yellowish green, the sides with or without blue spots; lips brown or lead blue. Iris pale yellow or silvery, uniform or brown-blotched. Vertical fins hyaline, the spinous portions with suffused dusky blotches, the rays of the soft portions, more or less distinctly zoned with purplish brown and gray, the darker color sometimes encroaching on the membrane; caudal olive-green, the lobes deeply glossed with yellow, the outer ray above and below with alternate black and gray patches, sometimes with one or more inconspicuous darker cross-bands; pectorals uniform pale

yellow or gray, with a blackish basal blotch; ventrals dusky, or hyaline with dusky blotches (*consobrinus*, a cousin; on account of its close relationship to *S. albopunctatus*).

Described from three Moreton Bay specimens, measuring between 228 and 236 millim. Type in the Queensland Museum; Reg. No. I. 291.

SIGANUS AUROLINEATUS sp. nov.

Golden-banded Spine-Foot.

Depth of body 1.97,¹ length of head 3.7, of caudal fin 4.17, of pectoral 4.48, of ventral 5.65 in length of body. Length of snout 1.96, diameter of eye 3.33, width of interorbit 3.27, of preorbital posteriorly 3.81, depth of cheek 3.08, longest dorsal spine 1.9, longest anal 1.82 in length of head.

Body ovate, its depth about 1.87 time the length of the head; mesial length of caudal peduncle 1.89 in the length of the snout. Fronto-occipital profile feebly concave; profile of snout feebly concave and strongly declivous, without conspicuous fronto-nasal gibbosity. Upper lip of moderate width, the upper lateral edges linear, its symphyseal length 1.71 in the eye-diameter. Eye moderate, situated slightly below the cephalic profile, its diameter 1.7 in the length of the snout; supraorbital edge feebly serrated anteriorly, the posterior denticle the longest; interorbital region evenly convex, its width equal to the eye-diameter, and 1.16 time the space between the eye and the closed maxillary. Maxillary extending to below the posterior nostril, its distal width 4.08 in the length of the snout. Nostrils on a level with the lower fourth of the eye, the internasal space less than that between the posterior nostril and the eye, which again is less than that between the anterior nostril and the edge of the preorbital. Opercle vertically striated.

D. i + xiii 10; A. vii 9; P. 17; V. i 3 i.

Spinous dorsal fin with undulous outline, the spines increasing in length to the seventh, which is but little longer than the last, this exceeding in length the intervening spines; soft dorsal acutely pointed, the third and fourth rays longest, one third more than the longest spine, its base 2.41 in that of the spinous portion. Caudal emarginate, with subequal pointed lobes, the middle rays 1.37 in the upper. Anal originating a little nearer to the tip of the snout than to the root of the caudal, the spines increasing in length to the last, which is slightly more than the longest dorsal spine and 1.32 in the third and longest ray; margin of soft anal obtusely pointed, its base 1.45 in that of the spinous portion, its height a little more than that of the soft dorsal. Pectoral rounded, its length 1.21 in the head. Ventral inserted in advance of the middle of the appressed pectoral, the space between its origin and the anal 1.58 in its distance from the tip of the snout, that between its tip and the anal 4.2 in its length.

¹ Depth of body 2.45 in the total length.

Vent midway between origin of ventral and anal.

Chocolate-brown with several narrow orange bands along the sides of the body. Head lighter, apparently with two orange bars, enclosing a pale greenish yellow interspace, extending from the rictus to the lower border of the eye, the upper bar forked posteriorly. Fins immaculate, with the exception of a few brown spots near the tips of the middle caudal rays¹ (*aurum*, gold; *lineatus*, banded).

Described from a single example, 184 millim. long, collected at Somerset, North Queensland, by the late Mr. Kendal Broadbent. Type in the Queensland Museum; Reg. No. I. 449.

The nearest ally of this species appears to be the *Amphacanthus lineatus*² of Cuvier and Valenciennes, obtained by Messrs. Quoy and Gaimard from the seas of Vanicolo and New Guinea. The description given by Valenciennes, and copied by Günther,³ is wholly inadequate to determine the species accurately, but one character, the size of the head, is so conspicuously different that I think it advisable to keep the two species distinct until fresh specimens can be obtained from the type localities. This should not be difficult since Valenciennes states that it is "common at Vanicolo," and North Queensland collectors should be able to find it in our waters. The French author gives the head, in specimens of about the same size as ours, as being 4.5 in the total length in his *Siganus lineatus* in *S. aurolineatus* it is but 3.7, which is altogether too great a disparity.

LEPTOSCOPIDÆ.

LEPTOSCOPUS MACROPYGUS Richardson.

This species is now for the first time recorded from Queensland waters. It appears to be not uncommon in the rock-pools about Cape Moreton and Point Lookout, from which localities I have received it on three separate occasions.

SCOMBRIDÆ.

GASTEROCHISMA MELAMPUS Richardson.

During the month of August, 1911, while passing along Queen Street, my attention was attracted to the dismembered portions of a large fish exposed for sale in the window of one of our leading fishmongers. Inquiries of the

¹ This specimen has for many years been preserved in diluted methylated spirits and exposed to a strong light; it is therefore difficult to say what the original colors may have been. The specific name by which I have described it was attached to the specimen by Mr. De Vis as a *nom. mus.*, and it is presumable that the longitudinal body-bands were much more distinct when he received the specimen than is now the case.

² Hist. Nat. Poiss., x, 1835, p. 130, pl. cclxxxvi.

³ B.M. Catal. Fish., iii, 1861, p. 322.

proprietor elicited the fact that the fish was caught in the Bay along with five similar examples; also that they were quite unknown both to fishermen and dealers. Unfortunately all six had been cut up and sold before I became aware of their presence, and I was only able with difficulty to secure the head of this specimen for the Queensland Museum. This however was quite sufficient to show that our visitors were of the above species, which is here recorded for the first time from the Coast of Queensland. All of the six specimens sold in the Brisbane Market were of large size, measuring from thirty inches upwards.

At the time of this visitation it was also noticeable that fully a dozen tunnies (*Thunnus thynnus*) were exposed for sale in the Brisbane Market and shops, and attracted much attention in the latter from passers-by. One of these was secured intact for the Queensland Museum. This fish is a very rare visitant to our shores.

LEIOGNATHIDÆ.

LEIOGNATHUS HASTATUS *nom. nov.*

Equula longispina De Vis, Proc. Linn. Soc. N.S. Wales, ix, 1884, p. 542: Cape York. Not *E. longispinis* Cuvier & Valenciennes 1835.

Long-spined Pony-Fish.

Depth of body 2·5,¹ length of head 3·5,¹ of second dorsal spine 1·7,¹ of second anal 3·4¹, of caudal fin 3·57¹ in length of body. Length of snout 2·04, diameter of eye 3, width of interorbit 3·58, length of nuchal spine 2·33, of pectoral fin 1·43, of ventral 2·15 in length of head.

Body ovate, the ventral contour a little more arched than the dorsal. Head a little longer than deep; profile of snout and interorbit obliquely linear, of occiput and nape slightly convex; mandibular outline feebly concave and moderately declivous; tip of snout on a level with the middle of the eye, its length equaling the eye-diameter, which is one sixth more than the interorbital width. Jaws equal; maxillary extending to below the anterior border of the eye. Supraorbital ridges smooth, the occipital extensions slightly convergent, not continuous with the outer nuchal ridges; nuchal spine linear, extending three fifths of the distance between its base and the dorsal fin; lower limb of preopercle smooth, the angle somewhat roughened.

Scales distinct; breast scaly. Lateral line ceasing below the middle dorsal rays.

D. viii 16; A. iii 14; P. 16.

Dorsal spines with flexible tips, the second much the strongest, smooth, and greatly produced, reaching when depressed beyond the base of the last ray; third spine also somewhat produced, a little less than half the length of the

¹ Depth of body 3.13, length of head 4.37, of second dorsal spine 2.13, of second anal 4.26 of caudal fin 4.48 in the total length.

second, and like the fourth without basal serrature. Second anal spine produced, stronger and much longer than the third, smooth, and subequal to the third dorsal spine; third spine feebly serrated at the base. Pectoral as long as the head in front of the hinder border of the eye. Ventral moderate, not reaching to the anal, its spine 2.75 in the second anal spine.

Gill-rakers 4 + 14, short and slender, all functional.

Coloration (*vide* De Vis)—Uniform silvery, the upper lip black.¹

Length of body 75 millim.

Coast of North Queensland.

Described from the unique specimen obtained at Cape York, which forms the type of De Vis' *Equula longispina*.

This species differs from *Leiognathus fasciatus* in its much more slender habit, scaly breast, incomplete lateral line, etc.

LEIOGNATHUS MORETONIENSIS sp. nov.

Black-banded Pony-Fish.

Depth of body 2.42 to 2.59,² length of head 3.44 to 3.62,² of second dorsal spine 4.04 to 4.23,² of second anal 5.53 to 5.71,² of caudal fin 3.5 to 3.82² in length of body. Length of snout 2.77 to 3.21, diameter of eye 2.63 to 2.88, width of interorbit 2.68 to 3, length of nuchal spine 2.04 to 2.33, of pectoral fin 1.24 to 1.42, of ventral 1.77 to 1.98 in length of head.

Body ovate, the ventral contour slightly more arched than the dorsal. Head much longer than deep; profile of snout convex, of interorbit and occiput sublinear and moderately oblique, forming with the rounded nape a long shallow concavity; mandibular outline concave and strongly declivous; tip of snout on a level with the middle of the eye, its length equal to or rather less than the eye-diameter, which somewhat exceeds the interorbital width. Jaws equal; maxillary extending to below the anterior border of the eye. Supraorbital ridges serrulate anteriorly, the occipital extensions parallel, not continuous with the lateral nuchal ridges, which are serrulate and strongly convergent; nuchal spine feebly curved, extending two thirds of the distance between its base and the dorsal fin; lower limb of preopercle evenly serrulate.

¹ This specimen has been for many years exposed to a strong light and may now be described as "pale yellow above vertebral line of the body, silvery below. Head yellowish, except the cheeks, which are brilliantly silvery. Vertical fins hyaline; caudal, pectorals, and ventrals yellowish."

² Depth of body 3 to 3.24, length of head 4.23 to 4.51, of second dorsal spine 5.12 to 5.27, of second anal 7 to 7.25, of caudal fin 4.44 to 4.76 in total length.

Scales small and inconspicuous; breast naked. Lateral line ceasing below the last dorsal rays and composed of about 38 pores.

D. viii 16 or 17; A. iii 14; P. 15.

Dorsal fin originating above the base of the ventral, the spines with flexible tips; second spine smooth, but little stronger than the third, and reaching when depressed to the fourth soft ray; third spine 1.12 to 1.18 in the second and, like the fourth, serrated at the base anteriorly. Second anal spine longer and much stronger than the third, about as long as the fourth dorsal spine; third spine serrated basally. Ventral long, not quite reaching to the anal, its spine 1.60 to 1.72 in the second anal spine.

Gill-rakers 3 + 16, short and slender.

Back and upper sides pale brownish yellow, profusely ornamented with oblique darker bars and occasionally a few pyriform spots above the lateral line, and vertical bars with more or less numerous round spots between it and the median line of the sides; below this is a wider blackish band, rarely absent, having a downward curve anteriorly from above the pectorals to the peduncle; lower sides, abdomen, and breast silvery, the edges of the thorax black-dotted. Small blackish dots crowded together on the side of the snout and much more sparsely scattered over the cheeks and opercles; isthmus smoky yellow. Iris silvery, with a broad blackish border above. Fins colorless; a narrow blackish stripe along the base of the dorsal; hinder base of pectoral profusely black-dotted, but not evident as an axillary spot (*moretoniensis*, belonging to Moreton Bay).

Described from two examples, measuring 67 and 81 millim., taken by seine at Bulwer, Moreton Bay, and forwarded to the A.F.A.Q. Museum by Mr. James Palmer in May, 1909; Cat. No. 1106. During the operations of the Endeavour on the Queensland Coast this species was found to be very abundant in Moreton Bay, 149 specimens being taken in a haul off Moreton Island on the 31st July, 1910, at a depth of 9 fathoms on a muddy bottom.

BLENNIIDÆ.

SALARIAS spp.

The Queensland Museum has lately acquired from Darnley Island, through the good services of Mr. J. R. Tosh, several fine specimens of the handsome *S. fasciatus* Bloch. An examination of these forces me to the conclusion that *S. lineolatus* Alleyne and Macleay cannot be separated from Bloch's species. There were also several specimens of the very beautiful form described by the same authors as *S. irroratus*; this appears to be a valid species.

TETRAODONTIDÆ.

SPHEROIDES TUBERCULIFERUS *sp. nov.*

Fringe-gilled Toado.

Plate 14, fig 1.

Depth of body 3·21 to 3·33, length of head 2·72 to 3 in length of body. Greatest depth of caudal peduncle 2·09 to 2·53, width of head 1·05 to 1·13, length of snout 2·37 to 2·78, diameter of eye 3·38 to 3·57, width of interorbit 6·83 to 8·45, height of dorsal 1·87 to 2·38, of anal 2·56 to 2·77, length of caudal 1·55 to 1·78, of pectoral 1·96 to 2·11 in length of head.

Body robust and depressed, its upper profile gently and evenly rounded between the occiput and the dorsal fin; greatest depth of peduncle 1·13 to 1·28 in its greatest width and 1·68 to 1·86 in its mesial length from above the end of the anal, its least depth 1·26 to 1·47 in the eye-diameter. Depth of head 1 to 1·16 in its width, its length a little less to a little more than that of the trunk. Upper profile of snout linear or feebly convex and declivous, the mouth well below the level of the eye; chin prominent, its vertical depth 1·65 to 2 in the length of the snout. Nostrils pierced in a low papilla, rising from an ovate depression, above the rim of which it is but little perceptible. Eye rather large, not adnate to the lower lid, and encroaching considerably on the cephalic profile, its diameter 1·25 to 1·5, the concave interorbital width 2·71 to 3·5 in the length of the snout.

Skin of head and body more or less coarsely striated, of tail smooth. Dorsal surface from the occiput to the dorsal fin, throat, and abdomen armed with coarse spinules as also is a transverse band behind the base of the pectoral; upper surface and sides of head, sides of body except where stated, and entire tail unarmed. Lateral line forming a long gentle curve above the pectoral fin, between the appressed tip of which and the dorsal fin is a short but somewhat abrupt downward curve, beyond which it runs straight to the root of the caudal; an undulous connecting branch across the nape; beyond this the main line curves gently downwards to the postero-inferior angle of the eye, and crossing the free lid is continued forwards to a level with the nostril, where it forms a loop, which, skirting the nasal depression posteriorly, bends backwards and, passing entirely around the eye, crosses the main line behind the eye and is continued downwards to the lateral fold; a short subsidiary branch detaches itself from the nasal loop to pass in front of the nostril, where it ceases. Sides of head and body with a well-developed fold, which meets across the chin.

D. 10; A. 7 or 8; C. 8; P. 16.

Dorsal and anal fins subfalciform, the length of the former 2·23 to 2·5 in its height; anal originating below the last third of and much smaller than the dorsal. Caudal fin rounded, with the outer rays slightly produced. Pectoral fin evenly rounded.

Gill-opening wide, extending a little above and from ·06 to ·2 more than the base of the pectoral, the outer anterior edge bearing 7 or 8 fleshy tubercles, the inner flap concealed or present only as a short angular projection.

Upper surface and sides lavender-gray closely speckled with brown, the spots on the head and back much smaller than those on the sides and tail; lower surface uniform rufous white; young examples with four broad dark transverse bands, the first linear crossing the occiput, the second curved backwards between the bases of the pectorals, the third more feebly curved includes the base of the dorsal, the last straight across the peduncle; these bands grow fainter with increasing age, and in our largest example only traces of the last two remain. Fins uniform yellowish white, the caudal broadly tipped with blackish brown (*tuberculum*, a small protuberance; *fero*, I bear).

Described from three examples, measuring from 113 to 164 millim. The largest, which is in the A.F.A.Q. Museum, was obtained in Moreton Bay by Mr. J. H. Stevens, Cat. No. 1514; the smaller of the two others is in the same Museum, Cat. No. 1799, while the remaining specimen (134 millim.) is now in the State Museum, Reg. No. I. 405. The two last were forwarded from Wide Bay by Mr. Fred. Leftwich, to whom, as also to Mr. Stevens, our thanks are here tendered.

This species may be distinguished from all our other tetraodontids by the presence of the prebranchial papillæ.

TROPIDICHTHYIDÆ.

EUMYCTERIAS CALLISTERNUS Ogilby.¹

The A.F.A.Q. Museum possesses a beautiful specimen of this fish, which was given to me some ten years ago by Mr. J. R. Tosh, who had captured it at Southport.

GOBIESOCIDÆ.

LEPADICHTHYS FRENATUS Waite.²

I obtained a single specimen of this sucker adhering to the under side of a piece of loose coral on Nor-West Islet during the visit of the Endeavour in 1910. The species had previously been known only from Lord Howe Island.

¹ Mem. Austr. Mus., ii, 1889, p. 74, pl. iii, fig. 5.

² Rec. Austr. Mus., v, 1904, p. 180, pl. xxiv, fig. 2.

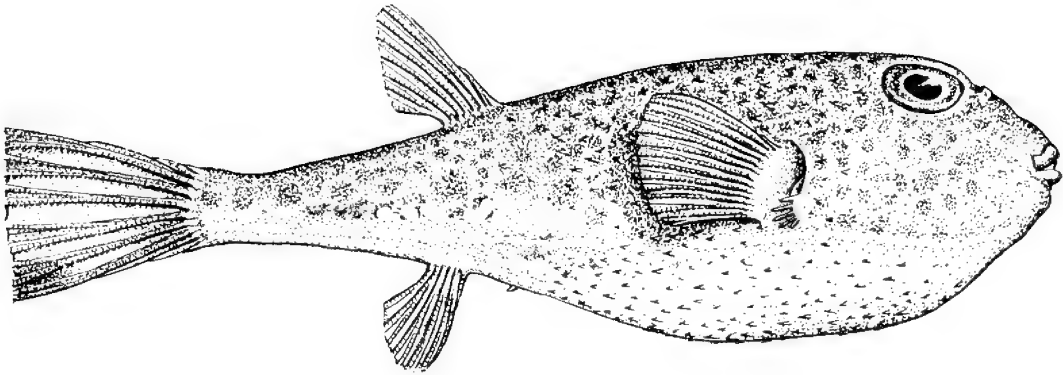


FIG. 1.—*Spheroides tuberculiferus* Ogilby. Nat. size from type.
D. B. Fry, del.

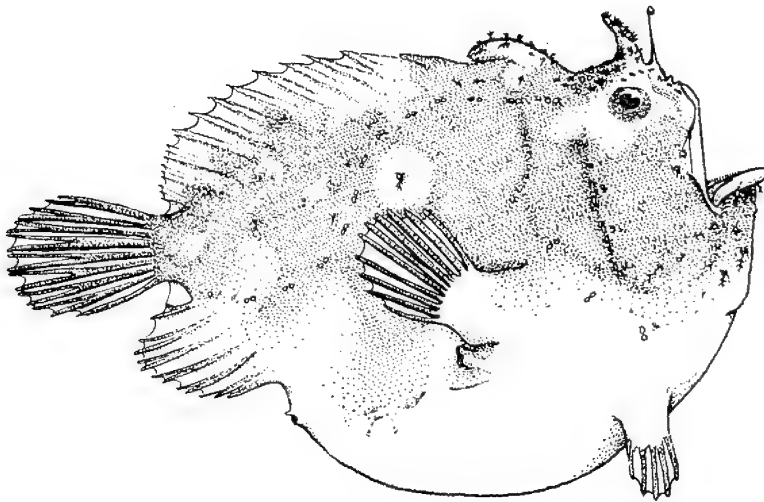
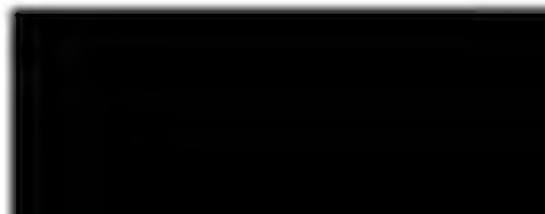


FIG. 2.—*Antennarius stigmaticus* Ogilby. Nat. size from type.
D. B. Fry, del. Face page 62.



ANTENNARIIDÆ.

ANTENNARIUS STIGMATICUS sp. nov.**White-spot Angler.**

Plate 14, fig. 2.

Depth of body about 1.45,¹ of caudal peduncle 8.9, width of head 2.66, length of head² 1.54, of caudal fin 4.37, of free pectoral limb 3.81, preanal length 1.2 in length of body. Width of interorbit 6.75, length of snout 7.43, of maxillary 2.88, of first dorsal spine 6.5, of third 4, of soft dorsal 1.37, of anal 2.74, of ventral 3.71 in length of head.

Habit robust. Upper profile from the tip of the snout to the origin of the soft dorsal gently rounded, its continuity broken by a deep naked transverse fossa between the second and third dorsal spines. Snout moderately declivous, its length 2.57 in that of the maxillary; eye small, its diameter 1.56 in the length of the snout and 1.72 in the convex interorbital width. Mouth vertical; distal extremity of maxillary obliquely truncated and as wide as the eye; mental tubercle moderate; a vertical groove below the eye.

Head and body covered with minute granular scales, each of which bears a bifid or trifid criniform spinule; cutaneous appendages short, more numerous on the lower surface of the head than elsewhere; each pore of the lateral line with a bifid filament.

D. iii 12; C. 9; A. 7; P. 10; V. 6.

Basal tubercle of first dorsal spine small, situated well behind the tip of the snout, the spine slender and short, terminating in a ciliated tubercle and extending when depressed to midway between the two posterior spines, its length rather more than that of the second, which is curved and mobile, clothed anteriorly with enlarged spinulose granules, not nearly reaching to the succeeding spine, and with only an inconspicuous basal membrane; third spine originating behind the eye, recumbent and immobile, not twice as long as the second, nor extending to the origin of the soft dorsal; neither of these spines possess terminal filaments. Length of soft dorsal fin 1.22 time its distance from the tip of the snout; rays gradually increasing in height to the eighth, which is the longest, 2.44 in the base of the fin; membrane of last ray reaching to the base of the caudal. Caudal rounded. Anal fin originating below the ninth dorsal ray, the outer border obtusely pointed; fourth ray longest, 1.38 in the basal length and 1.23 in the height of the soft dorsal; membrane of last ray not reaching to the base of the caudal, but the rays of both fins when depressed reach well beyond that base. Pectoral fin extending to the vertical from the vent.

¹ The stomach is so much distended that it is only possible to arrive approximately at the normal depth of the body.

² From the tip of the snout to the gill-opening.

Anal papilla moderately developed.

Coloration, after long immersion in alcohol:—Upper surface and sides dull violaceous brown, shading into yellowish white on the abdominal region; snout, lips, and a broad band through the eye to the margin of the preopercle white, the two former brown-dotted; chin and throat like the back; a large round white blotch on the middle of the side above the base of the pectoral; a dark-brown filament at the centre of the blotch. First dorsal spine white, the two others violaceous; soft dorsal white, with the anterior ray and the base pale brown; caudal, anal, ventral, and the inner surface of the pectoral fins white; outer surface of pectorals transversely barred with brown. Inner surface of mouth uniform gray.

Described from a single specimen, 98 millim. long, obtained in Moreton Bay. Type in the Queensland Museum. Reg. No. I. 363.

From the enormously distended stomach of this unique example there was taken a specimen of a *Holocentrus* measuring no less than 108 millim., that is 37 millim. more than the body of its captor not including the tail. The only signs of gastric action shown by the victim are on the head and caudal peduncle, where the bones are partly laid bare; the prey must therefore have been but recently swallowed at the time the fish was captured. When it is remembered that the *Holocentridæ* are covered with a panoply of strong close-set scales, which make it at any time a matter of difficulty to bend double one of these fishes, we shall be in a position to realise the enormous power which must have been exerted by the abdominal muscles of the *Antennarius* to enable it, after swallowing its prey, to bring the tail round to a level with the mouth; in addition one might almost be excused for believing that the long strong and erectile second anal spine of *Holocentrus*—which in this example measures 24 millim.—along with the coarse and sharply pointed armature of the head would have had a deterrent effect upon the angler.

TATHICARPUS MUSCOSUS (Ogilby.)¹

Previously known from the type specimen only, which was sent to the Queensland Museum from Port Curtis by Dr. Graham Butler; two others have been forwarded to me from Wide Bay by Mr. Fred. Leftwich, to whose collection I have twice previously had occasion to refer. One of these specimens has been retained in the A.F.A.Q. Museum, Cat. No. 1733; the second has been transferred to the State Museum, to take the place of the type, which has unaccountably disappeared.

¹ Proc. Roy. Soc. Queensl., xx, 1907 p. 22.

CERATODONTIDÆ.

NEOCERATODUS FORSTERI (Kreffit).

Early in October of this year the Queensland Museum became the fortunate possessor of a beautiful specimen of the " Queensland Lung-Fish," measuring 367 millim. (about 14.45 in.). This is, so far as I know, the smallest specimen in any museum; always excepting those which were bred from the ova by Mr. Thomas Illidge. It was presented to the Museum by Dr. Thomas H. May, of Bundaberg, who reported that it was obtained in Quay street during a heavy flood. This example has some irregular and crenate black blotches along the base of the dorsal fin. There are 33 scales on the lateral line.

AUSTRALIAN HYMENOPTERA CHALCIDOIDEA—I.*

The Family Trichogrammatidæ with Descriptions of New Genera and Species.

BY A. A. GIRAULT.

THIS paper includes the results of a preliminary survey of the family TRICHOGRAMMATIDÆ as found in Australia. Ten new genera and thirty-nine new species are added to our known forms of the group. So far, only three genera (and three species) had been recorded from the continent; herein are included a total of twenty-two genera and forty-five species. As this research has been confined within the space of about four and a half months, it probably does not include more than a large fraction of the forms existing here. The similarity of many of the genera with those of North America is to be expected from the known facts of geographical distribution of animals but the significance of this and other data will be discussed elsewhere. The paper is confined entirely to the systematic results.

All descriptions were made from specimens mounted in xylol-balsam and in normal position. Duplicate specimens will be deposited in the United States National Museum, Washington, D.C., U.S.A.

DEDICATION.

I respectfully dedicate this little portion of work to science, common sense or true knowledge. I am convinced that human welfare is so dependent upon science that civilizations would not endure without it and that what is meant by progress would be impossible. Also I am thoroughly convinced that the great majority of mankind are too ignorant, that education is too archaic and impractical as looked at from the standpoint of intrinsic knowledge. There is too little known of the essential unity of the universe and of things included, for instance, man himself. Opinions and prejudices rule in the place of what is true. Of many things, only one can be true and it is that fact which is being continually ignored by the ordinary man who is content to hold to his own opinion regardless whether it is right or wrong, to false religions which blind and prejudice him and to political parties which rule him according to their own particular creed of the moment. The individual man must be changed through education; not so much changed as developed and this depends primarily upon himself. It is a fact that the truly educated man has an enormous advantage in life as concerns his ability to detect truth. His nervous system is more sensitive and discriminative and this is very important, since it is through sensation that all knowledge is obtained. He is apt to be unprejudiced and unopinionated, to be rather simple in his tastes,

* Contribution No. 3, Entomological Laboratory, Sugar Experiment Stations, Mackay, Queensland.

EDITORIAL NOTE.—In his dedications and allocations of new names, Mr. A. A. Girault has adopted the somewhat unusual course of introducing philosophical matters of a contentious nature. On these points we must disassociate ourselves, but there are few, we imagine, who will find fault with his dedications in so far as they bring before us many illustrious names on the roll of science.—R. HAMLYN-HARRIS.

requiring not more than the necessities of life, finding pleasure in things which are really worth while and none or but little in things non-essential and superimposed. Too often the graduate of our schools and colleges is not himself or herself naturally developed, but a mere model moulded after a certain crude fashion and most probably with all natural tendencies and abilities dwarfed or badly injured. He or she as concerns the earth upon which a living must be obtained, families reared and moral and social relations maintained, is but yet a child and has yet to learn from that greatest of schoolmasters—Experience. How often too late this Master comes is shown daily in the common experiences of life and the aged vainly try to impress it upon the young, who cannot be taught but must learn.

I have just chanced upon two sentences of worth. One occurs in William Harvey's *The Generation of Animals* and has application here. Harvey himself is an excellent example of a man who trusted in his own sensations to know things and who knew of no other authority in such matters than his own common sense and that of others. His discovery of the circulation of the blood followed as a matter of course from the rise of his own common sensations in dissecting bodies while the men of medicine of his time were accepting what others had said centuries ago, yet performing the same operations as he did. Harvey said, "The method of investigating truth commonly pursued at this time therefore is to be held erroneous and almost foolish, in which so many enquire what others have said, and omit to ask whether the things themselves be actually so or not."

A second sentence occurs in one of the works of Francis Galton and also has application here. Men are extremely variable from their very nature and Galton says "The moral and intellectual wealth of a nation largely consists in the multifarious variety of the gifts of the men who compose it, and it would be the very reverse of improvement to make all its members assimilate to a common type. However, * * * * there are elements, some ancestral and others the result of degeneration, that are of little or no value, or are positively harmful." And thus, I take it, that if education is to be valuable to society—and that is the only reason for its existence—it should develop rather than mould and development is not an external process but wholly internal to the individual. The inequalities of humans are natural. The laws of society, the rules of education do not abolish them but tend rather to ignore. Stripped of all sentiment, superstition, fancies, dogmas and ancestral prejudices, it must be admitted that men are animals, subject to natural laws like all other animals; these laws in general are inevitable; therefore men must, like other animals, adapt themselves to them and to all the facts of nature. In so far as the mass of men are ignorant of the facts of nature, they may be truly said to be backward and non-adapted. They are not developed and an undeveloped society is in constant danger from itself—the individuals are neither adapted to the earth nor to each other. The mass of men are usually wise enough in a "worldly" way in that they know of human frailties, follies, greeds and passions and are able to maintain themselves, but evolution is a fact and demands more than this from social animals with such highly developed sensibilities as those possessed by mankind.

HYMENOPTERA CHALCIDOIDEA.

FAMILY TRICHOGRAMMATIDÆ Foerster.

SUBFAMILY CHÆTOSTRICHINÆ Girault.

TRIBE CHÆTOSTRICHINI Girault.

GENUS BRACHISTELLA Girault.

1. **BRACHISTELLA BICOLOR** new species.

Female:—Length, 0.75 mm. ; usual in size for the genus. Yellow with a broad black band across the base of the abdomen.

General color bright pallid lemon-yellow, the proximal half of the abdomen, caudal coxæ excepting tip, proximal two thirds of caudal femora, pronotum and a spot on the mesopleurum, velvety black. Eyes and ocelli bright red ; proximal club joint dusky ; fore wings sooty out as far as the end of the venation but fumated irregularly, a large clear area under the marginal vein, the fumation accented in two tranverse bands, one at the stigmal vein (fading caudad and interrupted) and one across the distal end of the submarginal vein. Remaining portions of antenna and legs concolorous with the body. Posterior wings slightly fumated across the venation.

Similar to the American species *acuminata* (Ashmead) but differing as follows : At first in details of coloration ; thus the abdomen is black at base, not appearing striped all the way down, the fore wings are fumated proximad (not so in *acuminata*, though in some cases with that species the substigmal spot extends entirely across the wing ; the remaining portion of the wing proximad, however, remains clear) and the caudal coxæ and femora are dusky black, wholly or in part, the mesonotum immaculate. Structurally, the fore wings of *bicolor* differ in that they are somewhat narrower, their marginal cilia somewhat longer ; the proximal funicle joint of the antenna is longer. The posterior wings though similar in shape are much narrower. Otherwise the two species are the same. In habitus they are very much alike. The mandibles of *bicolor* are tridentate, the mesophragma is present, the strigils absent, the parapsidal furrows complete, the fore wings at their broadest portion bearing about twenty lines of discal ciliation which is normally arranged, not in regular lines. The antennæ, as usual, apparently* bear two ring-joints and with the exception of the somewhat longer proximal funicle joint are very similar to those of *acuminata*.

(From a single specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the panes of a window in workmen's quarters on a sugar farm near Nelson, N.Q., December 19, 1911.

Habitat: Queensland (Nelson near Cairns).

Type: The single female as above, mounted in balsam and in the Queensland Museum, Brisbane, No. Hy/774.

* There are two ring-joints.

GENUS *ABBELLA* Girault.1. *ABBELLA SUBFLAVA* Girault.

I have a single specimen of this genus which I cannot distinguish from specimens of *subflava* excepting as follows :

The general coloration differs in that there is present in the Australian specimen but very little black, namely only a longitudinal dash leading ventrad and slightly mesad from the ventral apex of the eyes and along the cephalo-lateral margin of the pronotum ; the distal tarsal joints are only slightly dusky but the substigmal spot of the fore wing is much darker being velvety black or sooty in color, only embrowned in *subflava*. Specimens of *subflava* frequently lack the black and I do not consider the difference sufficient to warrant separation.

The specimen from Australia is larger than the American specimens.

This specimen was captured from the windows of an empty dwelling at Herberton, N.Q., December 28, 1911. The presence of *subflava* in Australia can be readily explained since it is known to be parasitic on jassid eggs occurring in the straws of that most widely distributed of plants, cultivated wheat. This crop is grown extensively in Queensland, especially back from the coast and as I expected, to some extent at Herberton and vicinity. The species of parasite is widely distributed in the United States of America.

Subsequently a second female was found which had been captured from a window in a granary on a wheat farm at Roma, Queensland, October 6, 1911 and a third one at Townsville by sweeping grass, July 11, 1912 ; the wings of this specimen were missing and the spots on the abdomen more distinct and larger.

Habitat : Australia—Queensland (Herberton, Townsville and Roma) ; North America—District of Columbia, Illinois and Washington.

2. *ABBELLA XANTHOGASTER* new species.

Female :—Length, 0.70 mm. ; usual in size for the genus.

General color brown, the metathorax and abdomen white tinged with yellowish, the abdomen with a faint row of dusky spots along its whole lateral aspect ; legs concolorous with abdomen but the femora are dusky as are also the cephalic coxæ ; antennæ brown ; vertex with some yellow ; eyes and ocelli ruby red ; substigmal spot as in *subflava* ; wings otherwise uniformly slightly fumated throughout ; venation pallid. Face darker.

The same as *subflava* except as already indicated in regard to coloration and as follows : The discal ciliation of the fore wing is finer and somewhat more dense (by about four more lines). Otherwise I cannot distinguish between them.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen captured by sweeping miscellaneous vegetation in the outskirts of Roma, Queensland, October 5, 1911 (A. A. Girault). It may be a variant of *subflava* but I doubt it.

Habitat : Australia—Queensland (Roma).

Type : The above specimen remounted in balsam from alcohol and in the Queensland Museum, Brisbane. No. Hy/776.

NEOBRACHISTA new genus.

Female :—Head normal, the ocelli arranged in a small triangle in the centre of the vertex, the lateral ocelli distant from the eye margins, the antennæ inserted below the middle of the face, 8-jointed—scape, pedicel, 2 ring-joints, 1 funicle joint and a 3-jointed club, somewhat as in *Ufens* Girault and *Brachistella* Girault, the funicle joint longer than wide, the scape short, compressed, swollen ventrad; pedicel cylindrical oval, longer than wide, like the funicle but slightly longer; ring-joints subequal, very short, narrower than the funicle; club cylindrical oval, the middle joint the longest of the three, the distal joint not ending in a seta; pubescence of antennæ moderate. Fore wings moderately broad, moderately broadly rounded, somewhat as in *Ufens* Girault, only three or four lines of the discal ciliation regular and distinct, the rest of the ciliation moderately dense and normal for the Chalcidoidea, the marginal cilia slightly longer than in *Ufens*, moderately short, the longest (caudo-distad) not more than an eighth of the greatest wing width; venation much as in *Ufens*, the submarginal vein very long, changing direction slightly distad of its middle, at the angle thickened and with a prominent spinelike prolongation caudad; the marginal vein very short and straight, barely longer than its own width and distinctly much shorter than the moderately long stigmal vein which has a distinct neck. Posterior wings short and moderately broad, bearing six lines of discal ciliation. The thorax subequal in length to the abdomen, the pronotum normal but when extended long and conical, the thorax with complete parapsidal furrows; abdomen cylindrical ovate, the ovipositor long, inserted near its base, the tip of its valves barely projecting beyond the abdomen. Legs normal, the proximal tarsal joint long, distinctly longer than either of the other two; strigils and also, apparently, cephalic tibial spur, absent. Oblique line of discal ciliation in the fore wing complete. No median sulcus on thorax (though apparently so in dried specimens). Mesophragma present. Mandibles tridentate, the two lateral teeth acute.

Male :—The same as the female but the abdomen is rectangular in shape and somewhat depressed, the club joints of the antennæ somewhat larger.

A genus in respect to the venation, which casually appears to be bowlike as in *Trichogramma*, likely to be somewhat confused with *Calleptiles* Haliday of the other subfamily. It is closely allied with *Ufens* Girault and *Brachista* Haliday but differs from all genera of its tribe in bearing 8-jointed antennæ with one funicle joint (excepting *Brachista*) and a very short marginal vein. Both ring-joints are not always visible and great care must be used in determining their presence. It may be *Brachista* Haliday but I doubt it.

Type : The following species.

1. NEOBRACHISTA FASCIATA new species.

Female :—Length, 1.00 mm. ; large for the family.

General color chrome-yellow, the abdomen striped transversely with dusky black (sometimes wholly dusky in dead specimens), the occiput, pronotum and cephalic margin of mesoscutum dusky, the eyes and ocelli bright garnet, the legs concolorous with body but sometimes the tibiae and coxæ pallid on the cephalic legs, the femora and tibiae of caudal two pairs of legs olivaceous, the antennæ concolorous but tinged with olivaceous, the club dusky ; venation dusky. Wings hyaline with only very slight traces of fumation under the submarginal vein, very slightly more noticeable under the angle of that vein. Distal tarsal joints dusky. As many as seven stripes across the abdomen, the second and third emarginate at the meson.

Thorax lightly, polygonally sculptured, the vertex finely transversely lined ; fore wings bearing about twenty-two lines of discal ciliation, the posterior wings six lines of which a cephalic two are paired at the cephalic margin and more distinct, a middle two less distinct and less close to each other and a paired line near the caudal wing margin, all the lines complete or nearly. Posterior marginal cilia of caudal wing about a third longer than the longest marginal cilia of the fore wing and over thrice the length of the cilia of the cephalic margin but still not longer than the width of the blade of the caudal wings. Pubescence of body very sparse ; four long setæ arise from both the mesoscutum and the mesoscutellum. A single straight line of discal ciliation in the subcostal cell (about 9 cilia) and a slender one leading proximad from the angle of the submarginal vein (three large cilia plus two minute ones).

(From three specimens, the same magnification.)

Male :—The same, the abdomen black.

Described at first from three female specimens captured from the panes of a window in workmen's quarters on a sugar farm, near Nelson, N.Q., March 31, 1912.

Subsequently, a female which I had placed as a new species of *Ufens* but whose antennæ were not visible, was found ; it was captured by sweeping in a jungle near Cooktown, N.Q., February 2, 1912 and on April 10, 1912 at Nelson near Cairns, one male and two females ; April 17, two females, all on windows in men's quarters on a sugar farm ; also a male in the same place, April 20 and a female May 18, 1912.

Habitat : Queensland (Nelson near Cairns and Cooktown).

Types : The three females mentioned above (March 31), in the Queensland Museum, Brisbane, No. *Hy*/781. One slide.

GENUS UFENS Girault.

1. UFENS PICEIPES new species.

Female :—Length, 0.75 mm. ; moderately large for the genus to moderate.

Similar to *niger* (Ashmead) in all details but differing in having the legs more colored, the tibiae dusky black and the femora of all the legs still darker (not the posterior femora only as in

the type species); also the distal tarsal joints are dark and sometimes the distal two. In *niger*—as mentioned in its original description—the scutellum is orange, not so in this species but here the vertex and the dorsal half of the face are orange. Tips of tibiæ, knees and trochanters pallid. The fore wings are also broader (about 30 lines of cilia across the widest blade portion). Otherwise, I cannot distinguish between the two.

(From two females, the same magnification.)

Male :—Unknown.

Described from two females captured from the pane of a window in a barn, State Farm, Roma, Queensland, 6 October, 1911. This is the second Australian species closely allied with the type species, which, so far, is known to occur only in the United States of America. Subsequently, another female was found, taken at the same place, the same time.

Habitat : Queensland (Roma), Australia.

Type : One female in balsam, October 6, 1911, Queensland Museum, Brisbane, No. Hy/777.

2. UFENS FLAVIPES new species.

Female :—Length, 0.75 mm. ; moderate to moderately large for the genus.

Similar to *piceipes* but all of the tarsi and the tibiæ are pale yellowish ; also the cephalic femora and distal halves (or less) of the other femora. The marginal vein of the fore wing is uniform in width, short, barely much more than twice longer than broad. The caudal marginal cilia of posterior wing are not as long as the greatest width of those wings.

The discal ciliation is less dense, the lines distinct and separate.

(From four specimens, the same magnification.)

Male :—The same, but the antennæ 9-jointed, bearing long, scattered hairs, the flagellum more uniform in width.

(From one specimen, the same magnification.)

Described from one male and six female specimens captured from the pane of a window in men's quarters on a sugar farm near Nelson, N.Q., December 4, 9 and 16, (3 ♀'s), 10 (1 ♂), 1911. Another female December 13, 1911 from a window in the School of Arts at Nelson. Still another female at Nelson, January 1, 1912 on a window ; and another by sweeping floor of forest along the coast opposite Double Island, near Cairns, December 24, 1911.

Habitat : Queensland (Nelson near Cairns).

Types : No. Hy/778, Queensland Museum, Brisbane, one male as above, one female (Dec. 16), two slides.

3. UFENS LUNA Girault.

Girault, 1911, pp. 198-199.

Perth, West Australia.

4. UFENS HERCULES new species.

Male:—Length, 0.80 mm.; very broad for the genus, large and robust for the family. General color deep black, only the base of the abdomen narrowly contrasting and yellow; vertex suffused with brown. Wings wholly hyaline; tarsi, knees and tips of tibiae white tinged slightly with yellowish. Venation black; eyes and ocelli red. Genitalia concolorous with body. Tip of antennae slightly more pallid.

Agreeing with *piceipes* in coloration nearly but the black is deeper; differing from all species of the genus by its unusually larger size and in the discal ciliation of the fore wing and the latter's great width. Thus, as compared in this respect with *piceipes*, the fore wings in *hercules*, though much wider, yet bear less lines of discal ciliation, the ciliation less dense, all the lines standing out distinctly and separated from each other (about 22 distinct radiating lines); also the marginal cilia of the fore wing in *hercules* are larger and farther apart; moreover in the posterior wing of *hercules*, which by the way is distinctly broader than in *piceipes*, the posterior marginal cilia are distinctly shorter, the longest distinctly not as long as the greatest width of the blade (distinctly longer in *piceipes*). From *flavipes*, besides the obvious differences in coloration and size, *hercules* differs in bearing a longer marginal vein, more distinct discal ciliation but nearly the same shaped posterior wing. It falls in between *piceipes* and *flavipes*. Mandibles tridentate. Posterior tibiae more hispid than usual.

(From one specimen, the same magnification.)

Female:—Unknown.

Described from a single male specimen mounted in balsam and captured from the window of a carhouse in the railway station at Mareeba, N.Q., January 2, 1912 (A.A.G.).

Habitat: Australia—Mareeba, Queensland.

Type: No. Hy/779, Queensland Museum, the above male in xylol-balsam (mounted with single specimens of two species of *Aphelinoidea*).

DIAGNOSTIC ARRANGEMENT OF THE AUSTRALIAN SPECIES OF *UFENS* GIRAULT.

FEMALES.

I. Posterior wings with only three lines of discal cilia.

1. Fore wings with the discal ciliation dense, the lines close together, a few standing out peculiarly distinct.

Fore wings moderately broad, bearing about thirty lines of discal cilia; vertex orange; all of the legs black, excepting articulations, tips of tibiae and two proximal joints of tarsi. Antennal club normal. Longest marginal cilia of posterior wing longer than the greatest width of the blade . . . *piceipes* Girault.

2. Fore wings with the discal ciliation less dense, all of the lines distinct and separate. Posterior wings normal, not convexly bevelled off at apex of caudal margin, the marginal cilia not abruptly shortening there.

- Marginal vein short, legs mostly pallid, vertex orange or yellow, fore wings hyaline; antennal club normal; longest marginal cilia of the caudal wing subequal to greatest width of the blade *flavipes* Girault.
- Marginal vein longer, usual in length; legs mostly black. A narrow yellow band across base of abdomen. Fore wings hyaline, broad and pyriform. Caudal wings broad, distinctly broader than their longest marginal cilia. Large species, antenna normal (male) *hercules* Girault.
- Posterior wings more obtuse, bevelled off convexly caudad at tip, at this curve the marginal cilia abruptly shortening.
- Marginal cilia of fore wing very short; fore wings slightly fumated proximad; legs mostly pallid *luna* Girault.

GENUS JAPANIA Girault.

1. JAPANIA TRISTIS new species.

Female :—Length, 0.80 mm. ; large for the genus.

General color black, marked with orange-yellow and whitish as follows : Vertex orange-yellow ; proximal ends of femora, knees and tips of all tibiæ silvery white contrasting with the blackness of the legs ; proximal two tarsal joints darker but pallid. Antennæ and venation dusky ; eyes and ocelli carmine. Wings hyaline.

Differing from the Chinese species, *ovi* Girault, in having the valves of the ovipositor slightly exerted and the tibiæ of the legs black except at tip and the cephalic aspect of the head for the most part black. Also in bearing a longer stigmal vein which here is subequal to the marginal in length. Fore wings moderate in width, somewhat as in *Ufens piceipes* but the marginal cilia are longer, moderately short, the marginal and stigmal veins longer, the discal ciliation less dense. Fore wings bearing about 18 longitudinal lines of discal ciliation across its widest blade portion, the ciliation in regular lines ; the curved oblique line leading back from the stigmal vein bearing about six cilia ; fore wings oblately rounded at apex ; stigmal vein long, its uncus pointing disto-cephalad. Posterior wings rather short and broad, bearing three lines of discal ciliation, two of which are in the cephalic half of the blade and more distinct than the third which includes slenderer cilia and the latter are farther apart in the line ; marginal cilia along cephalic margin very short, those at the caudal margin moderate in length, the longest slightly longer than the greatest width of the blade and about twice the length of the marginal cilia of the fore wing which are nearly uniform and longest around the apex to the caudal margin ; marginal cilia at apex of the posterior wing much shorter than the caudal cilia but about twice the length of the short cephalic marginal cilia. Cephalic margin of posterior wings straight, the apex obtuse.

Tarsal joints moderately long, lengthening distad, shorter on the cephalic legs ; tibial spur single, straight, apparently absent on cephalic legs (the strigil absent), on intermediate legs long and slender, subequal to the proximal tarsal joint ; short on caudal legs. Parapsidal furrows complete ; mandibles with at least two teeth. Abdomen slender, conic-ovate, longer than the head and thorax combined, the ovipositor very long, inserted far up near the base of the abdomen and a small portion of the tips of its valves is exerted beyond the apex of the abdomen which is pointed and slender. Ocelli in a line across the vertex.

Antennæ 8-jointed—scape, pedicel, 1-ring joint, 2-jointed funicle and 3-jointed club. Pedicel about half the length of the scape, long-obconic, distinctly over twice the length of the short funicle, whose two joints are transverse and subequal, each over twice wider than long. Funicle much shorter than any of the club joints, the latter about subequal in length, the distal joint conic and somewhat the longest, not terminating in a spine.

(From one specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen taken from the windows of a foundry at Mareeba, N.Q., December 26, 1911. The funicle of this species has somewhat the twisted appearance normal in *Ufens* but it is very much shorter than in that genus.

Habitat : Queensland (Mareeba).

Type : No. Hy/775, Queensland Museum, Brisbane, the forenoted female on a slide.

GENUS OLIGOSITA Haliday.

1. OLIGOSITA AUSTRALIENSIS new species.

Fore wings perfectly transparent, hyaline and naked.

Female :—Length, 0·60 mm. ; moderate in size for the genus.

General color uniformly pale lemon-yellow, immaculate, the eyes and ocelli dark reddish, the tips of the mandibles fuscous. Venation of fore wing more intense in color, the marginal, stigmal and distal ends of the submarginal veins, intense lemon-yellow. Wings very transparent and without discal ciliation ($\frac{1}{6}$ -inch objective), fuscation or substigmal spots. Face slightly paler. Vertex and distal joint of antennal club slightly dusky.

Fore wings moderately broad and their longest marginal cilia are somewhat shorter than the wings' greatest width ; the cilia are long. Stigmal vein short, sessile, bladder-shaped and its uncus terminal, forming a pointed apex which proceeds cephalo-distad. Parapsidal furrows complete. Ovipositor not exerted. Posterior wings narrow, bluntly pointed, without discal ciliation but with very long marginal cilia, those of cephalic margin distad over twice the blade's greatest width, gradually lengthening around the apex, along the caudal margin longest, nearly as long as the longest cilia of the fore wing and about four times the blade's greatest width. Tarsal joints of anterior legs moderate in length but much longer than wide, subequal ; in the two posterior pairs of legs, unequal, the proximal joint lengthening and longer than the others. Mandibles with two distinct, equal, subacute lateral teeth and a third, much smaller one. No strigils. Eyes naked. Antennæ 7-jointed, as in the other species ; the single funicle joint is distinctly smaller than the proximal club joint, while the latter is only three fourths the length of the long pedicel. Antennal club at apex armed as with *sanguinea* Girault but the visible and conspicuous seta is shorter and less noticeable. The posterior femora are somewhat enlarged.

Abdomen long, conic-ovate, the ovipositor long but not exerted.

Male :—Unknown.

Described from a single female specimen captured from the panes of a window in a field laboratory, established in a room in a hotel at Nelson (Cairns District), N.Q., November 14, 1911.

Habitat : Australia—North Queensland (Nelson).

Type : No. Hy/782, Queensland Museum, Brisbane, the forenoted female on a slide.

This species differs from all others of the genus so far as known, excepting *collina* Haliday, *staniforthii* Westwood and *nodicornis* Westwood, by lacking a substigmal spot. Its characteristics are the immaculate uniformity of coloration, the clear and naked fore wings bearing long marginal fringes, the shape of the stigmal vein and the very long marginal fringes of the posterior wings, especially those of the cephalic wing margin (usually very short). The species of course resembles the American forms closely as regards its habitus but is distinct from any of them.

2. OLIGOSITA AMERICANA (Ashmead) Girault.

I have captured at Roma, Queensland what are undoubtedly two females of this species, described several years ago from North American specimens (from Illinois, U.S.A.). They were running over the panes of a window in a barn on the State Farm. Since the latter is devoted to experimental breeding of wheat and since *americana* is parasitic upon jassid eggs found within wheat stems, its occurrence here is the more understood but its nativity now becomes somewhat obscured, if it was not doubtful from the first. Subsequently another dwarfed female was taken from a window in a wool-house at Brisbane, Queensland, October 3, 1911.

Habitat : Australia—Queensland (Brisbane and Roma) ; North America.

3. OLIGOSITA MINIMA new species.

Male :—Length, 0.28 mm. ; very small for the genus and minute for the family. General color uniformly intense lemon-yellow, the legs all pallid yellow, the antennæ concolorous with the body but the distal club joint is dusky. Eyes and ocelli brownish red. Fore wings slightly clouded out as far as the venation apex and with a distinct comma-like dusky spot involving the stigmal vein and whose apex is turned.

Differs from all species of the genus in its minute size and in the structure of the fore wing which has peculiarities not known to be present in any other member of the genus. Along the posterior margin of the fore wing at a point just slightly caudad of the apex of the marginal vein there is a distinct break in the margin made by a re-entering curve, the margin changing from a convexity to a sloping concave curve, which continues distad until the apical curve of the margin is reached ; this peculiarity is obscurely indicated in other species (e.g. *americana*) but here it is distinct ; it looks as though the wing had been stood upon its edge and a piece sliced off its caudal margin with a knife. The fore wings are moderate in size, their marginal ciliation long, the longest (disto-caudad) distinctly longer than the greatest width of the blade (which is just where the curve of the apex begins) but not very much more so ; the discal ciliation of the fore wing is absent or nearly but there is a more or less distinct, short line at the cephalic margin from the apex of the

marginal vein containing about five cilia ; toward its end it becomes paired, the second line including about three cilia ; disto-caudad of its apex are two cilia in a longitudinal line ; otherwise, cilia apparently absent. Caudal wings are entirely naked discally ; their cephalic marginal cilia are very short, those of the caudal margin moderate in length, the longest about two thirds the length, or slightly more, of the longest cilia of the fore wings. Marginal and submarginal veins long, subequal, the stigmal vein with a very short neck. Parapsidal furrows complete. Other structural characters normal for the genus. Tarsal joints moderate, the distal one slightly longest of the three ; strigil absent. Mandibles distinctly tridentate.

Antennæ 7-jointed and normal for the genus ; the pedicel is rather long, three fourths the length of the scape and nearly twice the size of the single funicle joint which is one and two thirds longer than wide ; proximal club joint transverse, about half the length of the intermediate joint ; club terminating in several slender setæ. Abdomen conical. Mesophragma present. Ring-joint very short, inconspicuous.

(From two specimens, $\frac{1}{6}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Female :—(See beyond on p. 65).

Described at first from two male specimens mounted in balsam and captured November 27 and 29, 1911 from the foliage of bastard gum in a forest, Nelson, Queensland. (For description of female see beyond on p. 65.)

Habitat : Australia—Queensland (Nelson, Cairns District).

Types : No. Hy/783, Queensland Museum, Brisbane, 4 ♂'s, 1 ♀ in xylol-balsam (1 slide, 30 November, 1911) ; also 1 ♂, 27 November, 1911 (a total of two slides ; the first also bearing some eulophids ; the second the type female of *Stethynium vesalii* Girault and a pair of *S. lavoisieri* Girault, both as yet undescribed).*

4. OLIGOSITA PULCHRA new species.

Female :—Length, 0.50 mm. ; moderately small in size for the genus.

General color sooty black marked conspicuously with intense lemon-yellow as follows : Most of the head except a sharply delimited area ventrad of the ends of the eyes and including the mouth ; a conspicuous yellow band about the base of the abdomen and the mesoscutellum. Legs and antennæ greyish dusky, the trochanters, ends of femora and tibiæ pallid dusky. Wings colored almost as in *subfasciatipennis*. Venation greyish dusky.

Fore wings moderate in width, not narrow, their greatest width distinctly greater than the length of their longest marginal cilia which are only about three fourths the length of an imaginary line drawn through the widest part (about midway between the wing apex and the apex of the marginal vein). Discal ciliation sparse and short but visible ; about seven longitudinal

* Described in Part II., following.

lines some of which are straight and regular ; beneath the venation absent excepting a line of three very minute cilia, centrally placed. Stigmal vein with no neck. Caudal wings with the paired line of the discal cilia cephalad ; normal, their caudal and longest marginal cilia about a fourth shorter than the longest marginal cilia of the fore wing. Apex of venation of caudal wing bearing four hooklets.

Mandibles tridentate ; body normal for the genus, the ovipositor not exerted ; tarsal joints moderate in length. Antennæ normal ; pedicel much longer than the single funicle joint, which is wider than long, subhemispherical in shape ; proximal joint of club larger than the funicle joint, wider than long, the second joint longer and wider, the third and distal joint conical, terminating in a stout spinelike seta which is rather conspicuous, together with a shorter, less stout and inconspicuous one.

(From one specimen, same magnification.)

Male :—Unknown.

Described from one female mounted in balsam and captured November 22, 1911 from a window in a kitchen of working men's quarters on a sugar plantation near Nelson, Queensland.

Habitat : Australia—Queensland (Nelson, Cairns District).

Type : No. Hy/784, Queensland Museum, Brisbane, the above specimen in xylol-balsam.

This species is distinguished by its characteristic coloration but otherwise it is similar to *subfasciatipennis* Girault. On May 25 and 26, 1912 I obtained single females of this species at Nelson from spider webbing against a window pane in a private residence. They were dead. Also, in the same place, another female, June 24, 1912.

Oligosita minima was found to be quite common at Nelson. Since describing it I have captured the following specimens by carefully searching the foliage of bastard gum in forests adjoining town. These specimens occurred with a number of other chalcids, all yellow and similar in general appearance but varying in size. Thus several eulophids were largest, then followed species of *Stethynium* and then the smallest, *S. cuvieri** and this *Oligosita* : 1 ♂, 2 ♀'s ; 1 ♂, 1 ♀ and 4 ♂'s, 1 ♀, 30 November, 1911. The female is similar to the male but the abdomen is more pointed. Both sexes have a median sulcus on the mesoscutum and mesoscutellum. Another male has since been captured from a window in an empty house near Nelson December 10, 1911.

These yellow chalcids are associated with yellow species of Thysanoptera and froghoppers, all presenting the same general appearance but easily distinguished by the trained eye because of their distinct habit. This color appears to have some significance since it is so nearly similar to the whole insect association just noted and to the yellowish-green color of the foliage.

* Described in Part II., following.

5. OLIGOSITA AUREA new species.

Female :—Length, 0.62 mm. ; moderate in size for the genus.

General color bright greenish yellow, the abdomen faintly striped with black, the tip somewhat darker, the posterior coxæ and a space above it and a broad stripe across the intermediate coxæ dusky black ; distal tarsal joint dusky. Remaining portions of all legs and the antennæ concolorous with the body. Fore wings hyaline but with a substigmatal spot as in *americana* ; caudal wings faintly clouded throughout. The substigmatal spot points straight caudad but with a slight inclination proximad. Face ventrad of eyes blackish.

This species differs from all the Australian species noted above, with the exception of *americana*, by its dense discal ciliation of the fore wing. It is quite closely allied with *americana* from which it differs as follows : Its general coloration is different, the black on the coxæ and the bright greenish yellow of its body ; its fore wings are not slightly fumated throughout but clear and also they are narrower, their discal ciliation somewhat coarser but about the same number of longitudinal lines (about ten) ; also the proximal tarsal joints are much shorter, those of the fore legs only about half the length of the corresponding joint in *americana*, for instance, only about twice longer than wide, whereas in *americana* the proximal tarsal joint of the cephalic legs is at least five and a half times longer than wide, long and slender, in *aurea* short and subequal to the intermediate joint. Ovipositor's valves not exerted.

(From one specimen, the same magnification.)

Male :—Unknown.

Described from a single specimen captured at Nelson, N.Q., in the same place as the original specimen of *pulchra* was captured but some weeks later, namely on December 20, 1911.

Habitat : Australia—Queensland (Nelson, Cairns District).

Type : No. Hy/785, Queensland Museum, Brisbane, the above specimen (mounted on a slide with a *Paratrichogramma* and an *Alaptus*).

6. OLIGOSITA NOVISANGUINEA new species.

Female :—Length, 0.70 mm. ; moderate in size for the genus.

General color beautiful, bright sanguineous tinged with pink ; this bright color entering also the marginal vein, coxæ and the posterior legs as far as the tarsi. Base of abdomen with a broad white band across it involving over a third of the length of the abdomen ; ocelli red, eyes conspicuous, nearly black ; legs greyish or dusky white, the proximal two joints lighter, white ; the antennæ concolorous with the legs excepting the distal two antennal joints which are black. Fore wings clear but at the substigmatal spot which is sooty black and distinct but not pronounced, crossed by an almost invisible suffused band. Submarginal vein yellowish, ovipositor pallid yellowish.

Structurally, agreeing with *sanguinea*; discal ciliation of both wings, however, apparently absent. The proximal joint of the club appears to be longer than is the case with *sanguinea*, subequal in length to the second or intermediate joint.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen mounted in balsam and captured by myself from a window of workmen's quarters on a sugar farm, Nelson, N.Q., January 23, 1911.

Habitat : Australia—Nelson, Queensland.

Type : No. Hy/786, Queensland Museum, Brisbane, the forenoted female on a slide.

It was indeed surprising to see this species whose structural and colorational similarity to the species *sanguinea* (known so far only from the United States of America) is most marked; the broad perfectly white band across the abdomen must be considered its characteristic. Of the many specimens of *sanguinea* seen by me none have shown a tendency to have the abdomen thus banded. This form may be no more than a geographical variant but I doubt it very much.

While examining some incisions in a weed (made presumably by jassids for eggs) along a roadway near Nelson, early in April, 1912, I extracted what appeared to be a nearly perfect pupa of this species but I am not sure.

7. OLIGOSITA FASCIATIPENNIS new species.

Female :—Length, 0.40 mm.; moderately small to small for the genus.

General color bright lemon-yellow, the face, cephalic third of mesoscutum, a moderately broad band across the fore wings at the stigmal vein and a similar band across the abdomen slightly beyond (caudad) its middle, sooty black; venation concolorous; eyes dark red; legs uniformly concolorous to extreme tips; antennæ pallid dusky. Substigmal spot present; the fumated band of the fore wing is not as dark as it and is subcircular in outline, somewhat like a globe hanging from the stigmal vein and flattened along the caudal wing margin; hence the band stops at the base of the stigmal vein and does not proceed to the cephalic wing margin. Not quite half of that portion of the blade of the posterior wing distad of venation is sooty black, the fumation proximad.

Structurally characterised by the shape of the fore wings which are broadly pyriform, the apex broad, the marginal cilia only moderately long, the longest only slightly more than a half of the greatest wing width. The discal ciliation is moderately distinct but not dense, only about nine lines and confined to the broad, distal part of the blade; posterior wings bearing a single line of discal cilia along the cephalic margin, narrow, their caudal marginal cilia somewhat longer than the longest cilia of the fore wing. Funicle joint of antennæ much shorter than the pedicel, wider than long; distal antennal joint terminating in what appears to be a pair of very short but thick setæ, one from each side of the apex. Valves of the ovipositor projecting slightly; proximal tarsal joint of posterior legs longest. Pedicel of antenna subequal in length to distal club joint.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from a single specimen captured by sweeping in an open forest near Nelson, N.Q., February 18, 1912 (A. M. Lea and A. A. Girault). This species resembles some of the yellow species of *Signiphora*.

Habitat : Australia—Nelson (Cairns District), Queensland.

Type : No. Hy/787, Queensland Museum, Brisbane, one female in xylol-balsam (mounted with a female *Gonatocerus*).

The above species differs from *pulchra*, with which it may be confused, in the differently shaped fore wing and general coloration.

8. OLIGOSITA INSULARIS new species.

Female :—Length, 0.45 mm. ; moderate in size for the genus.

General color tawny yellow, all of the thorax brighter, nearly golden yellow, the legs pallid dusky yellow with the distal tarsal joint black ; antennæ greyish but with the club black, the spaces between its joints pallid. Wings hyaline, with the exception of the substigmal spot which is distinct and covers the knob of the stigmal vein, projecting thence proximo-caudad and sub-rectangular in shape. Fore wing very slightly infuscated throughout. Venation pallid dusky yellowish. Coxæ darker.

Fore wings moderate in width, slightly wider than their longest marginal cilia or subequal in width to the length of those cilia, the marginal cilia long, the discal ciliation sparse and inconspicuous but visible in a line following the apical margin of the blade and in a shorter line running distad from the knob of the stigmal vein ; otherwise, practically absent.* Posterior wings narrow, gradually narrowing distad, the blade slightly curved, apparently without discal ciliation, the caudal marginal cilia very long and conspicuous, nearly as long as the marginal cilia of the fore wing, the cephalic marginal cilia inconspicuous and short. Venation normal for the genus. Ovipositor long but not exerted. The proximal tarsal joints of posterior legs long and slender ; strigils absent.

Antennæ normal ; the obconic pedicel slightly longer than the funicle joint, which is subequal to the intermediate club joint, the other two joints of the club subequal in length, each slightly shorter than the funicle ; ring-joint distinct, single. Club terminating in a thick spinelike seta, which is slightly knobbed at its tip and resembles a minute drumstick.

(From numerous specimens, the same magnification.)

Male :—Unknown.

Described from forty-eight female specimens captured March 13 and 14, 1912 from the panes of four windows in a one-story unoccupied dwelling on the outskirts of the town, Thursday Island, Torres Strait, N.Q.

* But in an occasional specimen one can also see another line of cilia from the apex in the caudal third of the wing, the line extending under the knob of the stigmal vein but not near it ; in these specimens the ciliation is more distinct.

Habitat : Australia—Thursday Island, Torres Strait, Queensland.

Types : No. Hy/904, Queensland Museum, Brisbane, 6 ♀'s in xylol-balsam, one slide (March 13, 1912).

Cotypes in the United States National Museum, Washington, D.C., 9 ♀'s, similarly mounted, one slide (March 13, 1912).

9. OLIGOSITA HILARIS Perkins.

Perkins, 1910, pp. 658-659, text-fig.

A single female of this species known thus far from Honolulu only, was captured from a window in an unoccupied dwelling in the town of Thursday Island, Torres Strait, March 14, 1912. It was in company with many specimens of *insularis*. The specimen agrees with the original description of the species in general but the thorax has more yellow; the basal yellowish wide ring of the abdomen is pale yellowish, varying in density and occupies nearly the whole basal half of the abdomen; the antennæ and legs are dusky, excepting tibiæ and two proximal tarsal joints and the pedicel and first club joint of antennæ; the whole lateral aspect of the thorax black, more pronounced posteriorly. The antennæ agree well with the figure, but they terminate as usual in a long stout spine which is not shewn in the figure. The fore wings are as described but they are quite normal and moderate in width for the genus. They are practically two-banded—a fuscous shade proximad, under most of the submarginal vein (its proximal two thirds about), somewhat more pronounced at its distal margin in the shape of a rounded blotch of nearly the width of the wing at that place; and a moderately broad band across the wing at the stigmal vein, beyond the middle of the wing and moderately well defined. It is rectangular in shape. The “distinct blotch about the stigmal vein” of the original description does not describe this character, since it is the largest substigmal spot which I have ever seen in any species of the genus; it is conic-triangular in shape, obscures the short stigmal vein and is wholly within the transverse band. The discal ciliation of the fore wing is as in *insularis* nearly; the longest marginal cilia of that wing (disto-caudad) are subequal to its greatest width. Posterior wings moderately broad, curved, their discal ciliation normal, the single line of cilia distinct and near but not at the cephalic margin; its caudal marginal cilia are subequal in length to the longest marginal cilia of the fore wing. The ovipositor is not exerted. Proximal tarsal joint of posterior legs long, not much shorter than the combined lengths of the two distal joints. The strigil and cephalic tibial spur absent. Through a hand lens (Coddington, 1-inch Bausch and Lomb) the species appears to be nearly black, encircled by a contrasting golden band around the base of the abdomen, the wings with two dark stripes, one near base.

Although, from the original description of *hilaris* this specimen differs in that there is a distinct fuscous band across the wings at the stigmal vein, minor color differences and for the genus the wings are not narrow, yet I think I am justified in identifying it with that species. The male is unknown. The species resembles *pulchra* but its wings are narrower and the funicle much larger.

Subsequently another female specimen was found, captured at the same place and at the same time. One specimen has been deposited in the Queensland Museum in Brisbane.

10. OLIGOSITA SACRA new species.

Female :—Length, 0.70 mm. ; moderately large for the genus.

Immaculate, pale greenish yellow and like *australiensis* but the fore wings have a small substigmatal spot. Eyes and ocelli nearly black. The venation concolorous with the body. Wings hyaline or nearly, the discal ciliation of the fore wings faint but present. The substigmatal spot is small, rectangular but including the portion on the stigmal vein, caret-shaped.

Like *americana* and probably not differing from that species other than in general coloration, though the marginal cilia of the fore wings are somewhat shorter and the proximal joints of the tarsi shorter, much shorter than usual for *americana*. The scutellum is transverse. There are about six lines of discal ciliation. Antennal flagellum and caudal wings missing. Thorax with a median sulcus.

(From one specimen, the same magnification.)

Male :—(See beyond.)

Described from one female captured by sweeping grass in an open forest near Nelson, N.Q., April 18, 1912.

Habitat : Australia—Queensland (Nelson near Cairns).

Types : No. Hy/992, Queensland Museum, Brisbane, the following two female specimens in xylol-balsam, one slide (April 24).

Cotype : The above specimen in xylol-balsam.

This species, it is possible, may be *americana* but its place of capture and its coloration make me doubt it very much ; also it bears a median thoracic sulcus. Rather than identify it as that species I have named it. It resembles also *australiensis* but the latter has not a prominent uncus from the stigmal vein, nor discal ciliation of the fore wing, nor a substigmatal spot.

About a week after describing this species while sweeping grass in a forest near Nelson (April 24), I captured two more females. The funicle joint of the antenna is smaller than in *americana*, subequal to or shorter than the proximal joint of the club. On April 30, 1912, one male and four females were captured by sweeping in a similar situation, near Nelson. The male is like the female but the single funicle joint is distinctly longer, not subglobose.

11. OLIGOSITA ANIMA new species.

Female :—Length, 0.45 mm. ; moderately small for the genus.

The same as *aurea* but smaller and uniformly lemon-yellow in color. Also the proximal tarsal joints are longer, long and slender ; the distal tarsal joint, the eyes and ocelli black. The wings are the same. The funicle joint is long, longer than the proximal club-joint ; otherwise the same as *aurea*.

(From one specimen, the same magnification.)

Male :—Not known.

Described from a female captured by sweeping along a forest path, Nelson, N.Q., February 16, 1912 (A. M. Lea and A.A.G.).

Habitat : Nelson near Cairns, Queensland.

Type : No. *Hy/993*, Queensland Museum, Brisbane, the above female on a slide (mounted with many specimens of *Gonatocerus*).

12. OLIGOSITA FUSCIPENNIS new species.

Female :—Length, 0.50 mm. Moderate in size for the genus.

Through a lens resembling a species of *Ablerus* of the Aphelininae because of the very deeply clouded fore wings and the bright red eyes which contrast with the apparently steely blue-black of the body ; also somewhat in habitus.

General color black, the head and thorax dull yellow, the eyes bright crimson, the legs black excepting tips of tibiae and the proximal tarsal joint which are pallid yellowish, the second tarsal joint suffused with blackish ; tip of abdomen, including valves and ovipositor, yellowish ; antennae black, suffused with yellowish unevenly along the flagellum (excluding the pedicel) ; fore wings very pronouncedly, conspicuously fumated from base distad to some distance beyond the apex of the venation, the wider distal part of the blade (less than a distal half, more than a third) slightly stained but that part of the nearly clear area is less stained proximad where it joins the fumation so that there is a more or less distinct clear stripe across the blade just distad of the fumation, slightly beyond the stigmal vein ; the fumation is smoky black, its distal margin irregularly bulged distad, cephalad sloping back to the stigmal vein, whose apex projects slightly beyond into the nearly clear portion of the blade ; the fumation does not cross the stigmal vein, leaving the angle of the blade cut off by that vein clear or nearly. The caudal wings are also fumated for about the same proportionate distance distad.

Abdomen conic-ovate, the valves of the ovipositor projecting slightly or subexserted, the region one and three quarter times longer than the thorax. Mesopostscutellum ending in an acute point ; tibial spurs single, the cephalic ones apparently absent. The three tarsal joints subequal and moderate in length in the caudal legs. Discal ciliation of the fore wing distinct, mostly in the clear area excepting a longer line near caudal margin ; in regular lines (excepting distad), the number of lines being about fifteen of which about nine are isolated and conspicuous ; no oblique line from the stigmal vein ; the marginal ciliation moderate in length, the longest (around the entire apex and disto-caudad and disto-cephalad) not much more than a fourth the greatest wing width and subequal in length to the caudal cilia of the posterior wing. The latter slender, bearing three distinct, subequal lines of discal ciliation, two of which are cephalic.

Venation normal for *Oligosita*.

Antennæ 7-jointed, as in *Oligosita*; funicle joint small in relation to the pedicel and club joints, ovate, not half the length of the pedicel nor half of the size of the proximal club-joint; intermediate club joint largest of the club, the distal club joint conical but not terminating in a spinelike seta as usual for the species of *Oligosita*, the terminal seta small. Pedicel longer than any of the club joints.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female captured while sweeping grass in open forest country near a road in the vicinity of Hambledon Junction (Cairns), N.Q. June 7, 1912. The day was cloudy and threatening. This species is very characteristic in coloration and differs somewhat from the usual habitus of its genus. The club does not terminate in a large spinelike seta and there is no substigmal spot. Before seeing its essential structures I thought that it would certainly be of a genus as yet unknown.

Habitat: Australia—Hambledon Junction near Cairns, Queensland.

Type: No. *Hy/1034*, Queensland Museum, Brisbane, the foregoing female mounted by itself in xylol-balsam (head separated from the body).

DIAGNOSTIC ARRANGEMENT OF THE AUSTRALIAN SPECIES OF *OLIGOSITA* HALIDAY.

FEMALES.

I. Species blood-red in color.

Sanguineus with a broad white band across the base of the abdomen. Fore wings narrower than their longest marginal cilia and without visible discal ciliation.

Substigmal spot distinct. Funicle joint long *novisanguinea* Girault.

II. Species yellow or dusky yellow, or yellow marked with dusky; or black marked with yellow.

1. Substigmal spot of fore wing absent or else obscured.

Fore wings without visible discal ciliation; body uniformly greenish yellow.

Funicle joint short *australiensis* Girault.

Fore wings with visible discal cilia distad, arranged in regular lines; body deep black, the head and thorax with yellow; wings deeply fumated, terminal seta of antenna small

fuscipennis Girault.

2. Substigmal spot of fore wing present, distinct but sometimes small.

(a.) Fore wings with the discal ciliation very sparse, indistinct or invisible (high power).

Uniformly yellow, legs paler; substigmal spot small; discal ciliation of the fore wing apparently absent. Fore wings slightly narrower than their longest marginal cilia. Minute in size

minima Girault.

(aa.) Fore wings with the discal cilia visible (low power), like pubescence but sometimes only a line or two can be seen.

(b.) Yellow, the abdomen black except at base.

Funicle joint much smaller than the pedicel; wings wider than the length of their marginal cilia.

- Yellow, most of the abdomen and sides of thorax dusky black ; sub-stigmal spot large ; fore wings broader than their longest marginal cilia, rounded at the apex, the discal ciliation present but not easily visible with low power ; legs and antennæ dusky. Fore wings with a more or less obscure fumated band across them at the stigmal vein. Usual in size *pulchra* Girault.
- Funicle joint subequal in length to the pedicel ; wings narrower than, or only equal to, their longest marginal cilia.
- Yellow, the abdomen black with a broad yellow band at base ; sides of thorax black ; fore wings with a more or less distinct dusky band across them at the stigmal vein. Substigmal spot large *hilaris* Perkins.
- (bb.) Yellow species, the abdomen faintly striped with dusky or yellow suffused with dusky.
- (c.) Discal cilia of fore wing very distinct.
- Tip of abdomen, ventral half of face, stripe on each side of cephalic thorax, one across intermediate coxæ, one above caudal coxæ and the latter dusky black. Wings hyaline, their discal ciliation (fore wing) very distinct, moderately long ; proximal tarsal joint of caudal legs not much longer than the intermediate joint ; funicle joint of antennæ hardly longer than the proximal joint of the club *aurca* Girault.
- Uniformly yellow ; proximal tarsal joints long and slender ; funicle joint longer than the proximal club-joint *anima* Girault.
- (cc.) Discal cilia of fore wing not very distinct.
- Body uniform in color with the exception of faint indications of black transverse bands across the abdomen ; wings hyaline. Proximal tarsal joint of caudal legs longer, distinctly longer than the intermediate joint, funicle joint usually longer than the proximal club-joint. Fore wings broad *americana* Girault.
- Bright lemon-yellow, the face, cephalic third of mesoscutum and a broad band across the abdomen beyond middle, sooty black ; a distinctly sooty band across the fore wings at the stigmal vein ; apex of fore wings nearly flat ; marginal cilia of posterior wing longer than those of the fore wing *fasciatiennis* Girault.
- Tawny yellow, the thorax brighter, nearly golden yellow ; legs pallid dusky yellow ; antennæ greyish, the club black ; substigmal spot covering the knob of the stigmal vein ; fore wings slightly infuscated throughout. Discal ciliation of the fore wing very sparse. Proximal tarsal joints long and slender. Pedicel slightly longer than funicle *insularis* Girault.
- Immaculate pale greenish yellow and like *australiensis* ; discal ciliation of the fore wing faint ; proximal joint of tarsi short ; funicle subequal to proximal club joint ; thorax with a median sulcus *sacra* Girault.

BRACHYGRAMMA new genus.

Female :—Head normal, the three ocelli in a triangle in the centre of the vertex, the latter elevated centrally, the eyes large, lateral, naked, the antennæ inserted much below the middle of the face, distinctly ventrad of an imaginary line drawn between the ventral ends of the eyes, 7-jointed—scape, pedicel, one ring-joint, two funicle joints and a two-jointed club. Scape rather long, cylindrical, narrower at each end ; pedicel usual, obconic, longer than the whole funicle

but not very much more so, the funicle subtriangular, both of its joints wider than long, the first longer than the second; club broadly ovate, shaped somewhat as in *Tumidiclava* Girault but less regular and not so large, its distal joint longest, acute, but not terminating in a spinelike seta. Fore wings shaped very much as in *Pterygogramma* Perkins and with its ciliation about as in that genus but the venation is different; thus the marginal vein is broad and very short, just about twice longer than wide, the stigmal vein sessile, nearly absent, but represented by a short neckless projection from the marginal vein, subquadrate in shape and bearing an acute uncus from its disto-cephalic angle. Submarginal vein long, clavate and curved, more than thrice the length of the marginal vein. Ciliation short excepting along the caudal margin of the posterior wing where it is moderately short, but yet twice the length of the longest marginal cilia of the fore wing; it is not as long, however, as the greatest width of the caudal wings, which are very broad and shaped like the blade of a knife, bearing but three lines of discal ciliation; their cephalic marginal cilia are very short. No oblique line of discal ciliation running back from the stigmal vein.

Abdomen somewhat longer than the head and thorax combined, sessile, conical and not pointed, the ovipositor short and not exerted, inserted at distal third; parapsidal furrows sharply defined; pronotum, mesoscutum and the scutellum, the metanotum and phragma, with a sharply defined median sulcus. Mesophragma well developed. Tarsal joints moderately long, much shorter in the cephalic legs; tibial spurs single, short, absent from the cephalic legs. Legs normal to the family. Body long.

Male:—Unknown.

A unique genus bearing antennæ shaped like those of *Paratrichogramma* and wings like those of *Pterygogramma* but the antennal segmentation and wing venation resemble those of no genus now known; the median sulcus of the thorax is exceptional, occurring in no other genus of the family excepting a few species of *Oligosita* and in *Ittys* and *Neocentrobia*.*

Type: The following species.

1. BRACHYGRAMMA BICLAVATUM new species.

Female:—Length, 0·90 mm.; moderately large for the family.

General color dull honey-yellow, blotched with dusky black; antennæ, cephalic margin of the head, pronotum, cephalic two thirds of mesoscutum excepting the lateral margins, cephalic half of the scutellum at the meson, mesophragma, postscutellum and metathorax and the cephalic halves of the abdominal segments (transverse stripes), femora, coxæ, tibiæ and distal tarsal joints dusky black; eyes and ocelli carmine. Venation dusky yellowish. Wings hyaline.

Fore wings bearing about fifteen lines of discal ciliation which is short but distinct; inner margin of submarginal vein crenulate. Proximal joint of antennal club wider than long, not much over half the length of the distal joint; proximal funicle joint nearly twice the length of the distal joint of that region which, as in *Paratrichogramma*, bears a short stalk, pedestal or petiole supporting the club. Scutellum not half the length of the scutum, wider than long; caudal margins of mesoscutum inclined cephalo-mesad, meeting at the meson.

* Described in following.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen mounted in balsam and captured from the pane of a window in workmen's quarters on a sugar farm near Nelson, N.Q., late in the afternoon of January 24, 1912. (A. A. Girault.)

Habitat : Australia—Queensland (Nelson, Cairns District).

Type : In the Queensland Museum, Brisbane, the above specimen, No. Hy/788.

The median sulcus in this genus, rather unique for the family, is present in many genera of the Eulophidæ.

PSEUDOGRAMMA new genus.

Female :—Head normal, the eyes moderate in size, the three ocelli arranged in a line across the vertex, the lateral ones near to the eye margins, the antennæ inserted well down on the face near the clypeal margin, somewhat below the ventral ends of the eyes, the scrobes well developed, forming a distinct inverted V-shaped groove; the mandibles tridentate. Antennæ 6-jointed, as in *Trichogramma* Westwood—scape, pedicel, 1-ring joint, 2-jointed funicle and solid club; the latter and the scape subequal in length, the pedicel obconic, moderately large, as long as the funicle whose joints are subquadrate but slightly longer than wide and subequal. Fore wings nearly as in *Trichogrammatoidea* Girault as concerns shape and ciliation and coloration but the venation is different, the marginal vein straight, short, only about a third the length of the long submarginal vein, the stigmal vein short, straight, somewhat less than half the length of the marginal vein and with only a very short neck; discal ciliation quite inconspicuous, short, sparse; marginal cilia moderate, as in *Trichogrammatoidea*, between a fourth and a fifth the greatest wing width; fore wings fumated; stigmal vein pointing nearly disto-caudad, appearing like a mere bulb attached to the end of the marginal vein; no oblique line of discal cilia leading back from the stigmal vein; about 7 lines of discal cilia.

Parapsidal furrows complete; abdomen as in *Trichogramma* Westwood, cylindrical ovate, sessile, the tip of the valves of the ovipositor reaching to tip and pointing it; abdomen somewhat longer than the head and thorax combined. The three tarsal joints moderate in length, the proximal joint longest, especially in the intermediate legs.

Male :—Unknown.

A genus so closely resembling *Trichogrammatoidea* Girault in general appearance that its type species was at once placed as a member of that segregate. However, though casually appearing curved, scrutiny of the marginal vein shows that it is truly straight and this fact combined with the short and straight stigmal vein justifies placing the species in this distinct segregate which becomes a component of a subfamily not containing *Trichogrammatoidea*, namely the Chætostrichinæ. In this subfamily, in my table of genera, *Pseudogramma* drops in next to *Chætostricha* Haliday from which it differs markedly in antennal structure.

Type :—The following species.

1. **PSEUDOGRAMMA FASCIATIPENNE** new species.

Female :—Length, 0·35 mm. ; small for the family.

General color tawny yellow, the abdomen black, the face, antennæ and legs dusky black, the vertex and proximal two tarsal joints yellow ; eyes and ocelli bright red ; fore wings hyaline but crossed by a conspicuous broad, smoky black band extending from the apex of the stigmal vein to the base of the distal third of the submarginal vein, its distal margin nearly straight. About seven longitudinal lines of discal ciliation in the fore wing.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from a single female captured from the windows of an empty dwelling at Herberton, N.Q., December 28, 1912.

Habitat : Queensland (Herberton).

Type : No. Hy/789, Queensland Museum, Brisbane, the above female mounted on a slide (with the female type of *Signiphora funeralis* Girault and specimens of *Abbella* and *Anagrus*). The head of the type specimen is missing.

NEOBRACHISTELLA new genus.

Female :—The same as female *Neobrachista* but more robust, the ovipositor not so long, not inserted near base of abdominal venter but rather just proximad of the middle of the venter, not just running to tip of abdomen and pointing it but distinctly exerted as in *Centrobiella*, the exerted portion covered by the valves and curved upward somewhat and equal to about a sixth of the length of the long abdomen. Antennæ also somewhat like those of *Neobrachista* but they are 9-jointed—scape, pedicel, 3 ring-joints, one funicle joint and a 3-jointed club, the funicle joint subpedunculate distad, wider than long and shorter than the pedicel ; antennal club longer than the rest of the flagellum, cylindrical ovate, its distal joint smallest and not terminating in a spine-like seta. Fore wings as in *Neobrachista* but the marginal vein is longer than the stigmal (shorter in the genus named) and there is no oblique line of discal ciliation leading back from the stigmal vein or else it is obscured ; the discal ciliation is normal and rather dense but there are two long lines which are regular and contrast with the rest of the ciliation ; the marginal cilia are short. The thorax bears a median sulcus to apex of mesophragma. Otherwise, about as in *Neobrachista*.

Male :—Not known.

The antennæ of this genus are very similar to those of *Neobrachista*.

Type : The species described forthwith.

1. *NEOBRACHISTELLA MAXIMA* new species.

Female :—Length, about 1.00 mm. ; large for the family.

Sooty black, the caudal half of the mesoscutum suffused with lemon-yellow ; tips of tibiæ, proximal two tarsal joints and the ovipositor (but not its valves) suffused more or less with yellowish as is also the scape, vertex and venation. Fore wings lightly clouded, the cloudiness more or less accented across the wing at the prominent, acute, caudal projection of the submarginal vein, under the marginal vein and across from the tip of the stigmal ; also, around wing apex.

Discal ciliation short, about twenty-two lines ; stigmal vein given off from the lower angle of the marginal, eggshaped and borne upon a distinct, slender though short, petiole. Discal ciliation projecting well under the venation.

(From a single specimen, the usual magnification.)

Described from a single female specimen captured June 17, 1912 from a window in men's quarters on a sugar farm at Nelson, N.Q.

Habitat : Australia—Nelson near Cairns, Queensland.

Type : No. *Hy/1075*, Queensland Museum, Brisbane, the forenoted specimen on a slide.

CENTROBIELLA new genus.

Female :—Head normal, the antennæ inserted below the middle of the face, 7-jointed—scape, pedicel, one ring, one funicle joint and a three-jointed club ; the funicle joint is smallest, cup-shaped, longer than wide, slightly smaller than the next joint. Fore wings as in *Pterygogramma* Perkins, the discal ciliation in regular lines, the oblique line leading back from the stigmal vein long, complete. Posterior wings normal but in balsam mounts sometimes very narrow and slender, acuminate acute. Parapsidal furrows complete. Abdomen longer than the head and thorax combined. The valves of the ovipositor conspicuously exerted for a length about a third that of the abdomen, curved, acute at apex. Otherwise as in *Pterygogramma*.

Male :—The same but the abdomen more rounded.

A genus resembling both *Pterygogramma* Perkins and *Lathromerella* Girault* differing from both in regard to the structure of the antennal club, the shape of the abdomen, presence of the antennal funicle and characteristics of wing ciliation. It may become confused with *Centrobia* Foerster and *Prestwichia* Lubbock but the ring-joint and abdominal characters should easily serve as a means of distinguishing them ; *Centrobia* has no ring-joint while *Prestwichia* has a long tubular abdomen. The genus is closely allied with *Centrobia*.

Type : The following species (*mulierum*).

* Described in following.

1. **CENTROBIELLA MULIERUM** new species.

Female :—Length, about 0.50 mm. ; moderate for the family.

Orange-yellow with much black ; thorax conspicuously orange-yellow ; the abdomen less so but marked distinctly with transverse black stripes ; most of the sides of the thorax dark ; legs and antennæ yellow but the former marked with black along most of each femur and the distal tarsal joint ; exerted ovipositor valves black ; venation yellow, suffused with dusky. Wings hyaline, but the fore wing distinctly, rather lightly fumated out to the end of the stigmal vein, the distal margin of the fumated area somewhat convex. Eyes bright red.

Fore wings with about seventeen lines of discal cilia, the oblique line from stigmal vein complete with about nine to ten cilia ; proximad near its caudal third is an isolated patch of cilia at the caudal wing margin and opposite the venation. Marginal cilia of fore wing moderately short, the longest distinctly not three fourths the length of the longest cilia of the posterior wing which bears but two complete lines of discal ciliation, in the cephalic half. The caudal marginal cilia of the posterior wings are about a third as long as the greatest width of the fore wing. Third joint of antennal club longest, the club not terminating in a spinelike seta.

(From one specimen, the same magnification.)

Male :—The same but the abdomen is not striped, the legs darker, the marginal cilia of the fore wings decidedly longer, nearly as long as the caudal marginal cilia of the posterior wing.

(From one specimen, the same magnification.)

Described from a single pair captured by sweeping grass in an open forest near Nelson, N.Q., April, 18, 1912. Dedicated with respect to women, more especially those who assert their mental equality to men, who are progressive and therefore do not have a tendency to keep back the development of the race through heredity.

Habitat : Australia—Queensland (Nelson near Cairns).

Types : No. *Hy/996*, Queensland Museum, Brisbane, the foregoing pair mounted in xylol-balsam (two slides ; the female mounted with a female of *Gonatocerus*).

Subsequently, a second female was captured from a window in men's quarters on a sugar farm at Nelson, May 20, 1912 and two more from a window in a private residence at Nelson, June 16 and 18, 1912 ; also a male was obtained by sweeping in a forest near Nelson, July 3, 1912 and a female July, 4 1912 from a window in a residence.

NEOCENTROBIA new genus.

Female :—Head normal, the three ocelli in a triangle in the centre of the vertex, the antennæ inserted slightly ventrad of an imaginary line drawn between the ventral ends of the eyes, 7-jointed, short and clavate, the club enlarged as in *Tumidiclava* Girault—scape, pedicel one minute ring-joint, one subtriangular funicle joint and a swollen 3-jointed club, which does not terminate in a spinelike seta ; funicle narrower than the club or pedicel, the latter stout as in *Tumidiclava*, the scape short. Mesoseutum and scutellum with a median grooved line. Fore wings nearly as

in *Tumidiclava* but the marginal cilia are somewhat longer, moderate in length, the longest between a third and a half of the greatest wing width ; the discal ciliation irregular, abundant but not dense and it is short, crowding back under the venation ; no oblique line of it from the stigmal vein ; the venation is different, the marginal vein short, only about four times longer than wide and slightly over a third the length of the submarginal vein, the stigmal vein with a distinct but not long neck, about half the length of the marginal vein, the latter straight. Abdomen conic-ovate, about equal to the combined lengths of the head and thorax, the ovipositor long, inserted at its base, its valves exerted together with itself, distinctly, for a length equal to a fifth of the length of the sessile abdomen. Legs normal, the intermediate and posterior femora somewhat swollen, the tarsal joints short, the proximal joint of the cephalic tarsi shortest ; *the cephalic tibial spur is present* but very short, not forming a strigil, the others single and longer. Posterior wings usual, rather narrow, with long marginal cilia caudad and apparently without discal ciliation. Mandibles with at least two teeth.

Male :—Not known.

This unique genus casually resembles *Tumidiclava* Girault but in my table of genera will run near *Centrobia* Foerster, since the funicle is present and the ovipositor exerted. It is also like *Ophioneurus* Ratzeburg, especially since the club wrinkles transversely in balsam when the specimen is heated, appearing 6 or 7 jointed and also because of the venation. *Ophioneurus*, however, has no funicle. The genus has the body of *Lathromeris*.

Type : The following species.

1. NEOCENTROBIA CARA new species.

Female :—Length, 0.50 mm. ; moderate in size.

Dusky yellow, the abdomen dusky black ; legs pallid yellowish excepting the proximal two thirds of the femora which are dusky black ; club and funicle of antenna dusky black, the scape and pedicel yellowish. Fore wings lightly fumated throughout, the fumation somewhat accented at the stigmal knob ; venation dusky yellowish. Distal tarsal joint not darker. Tibiæ with an obscure dusky band around it just out from base.

Fore wings bearing about from twelve to fourteen lines of discal cilia across its widest blade portion which are inclined to be massed in the middle of the blade, longitudinally, there being from the end of the venation distad to the apex, a more or less naked marginal strip between the first one or two lines along each margin and the remaining and central portions of the ciliation. The posterior wings *apparently* bear a single, inconspicuous line of discal cilia along its cephalic margin. Proximal tarsal joints of cephalic legs shortest, also the same joints of the other legs are shorter than the third or distal joint.

(From a single specimen, the same magnification.)

Male :—Not known.

Described from a single female specimen captured with specimens of *Tumidiclava ciliata* Girault by sweeping in grassy fields near Cooktown, N.Q., February 24, 1912.

Habitat : Australia—Queensland (Cooktown).

Type : No. Hy/994, Queensland Museum, Brisbane, the forementioned specimen in xylol-balsam (mounted with four females of the *Tumidiclava*).

TRIBE LATHROMERINI Girault.

LATHROMERELLA new genus.

Female :—Head normal, the eyes prominent, the lateral ocelli distant from the eye margins, the antennæ inserted below the middle of the face, 9-jointed—scape, pedicel, 2 ring-joints and a five-jointed club, the distal club joint ending in a straight spinelike seta ; pedicel distinctly longer than any of the club-joints, ovate ; ring-joints distinct, the first twice the size of the second, which is rather inconspicuous and appears to be the rimmed proximal end of the first club-joint ; funicle absent. Body long and slender, pointed, the abdomen conic-ovate, longer than the head and thorax combined, the ovipositor long but not exerted at all, nor are its valves, the latter merely tipping the apex of the abdomen. Parapsidal furrows complete ; mesoscutum much longer than the mesoscutellum, the latter subhemispherical. Legs normal, the three tarsal joints moderately long and subequal, the tibial spurs single, comparatively stout, about half as long as the proximal tarsal joint, present on the cephalic legs, the strigil absent. Mesophragma present. Abdomen sessile. Antennæ normal in shape, not dilated, the club cylindrical.

Fore wings somewhat as in *Pterygogramma* Perkins, the venation and ciliation much the same ; venation straight, the marginal vein long but distinctly shorter than the submarginal, the post-marginal absent, the stigmal vein distinct, short but with a distinct neck. Marginal ciliation like that of *Pterygogramma acuminatum*, the discal ciliation somewhat denser and more distinct than in that species, arranged in regular lines of which there are about fifteen. No oblique line of discal ciliation leading back from the stigmal vein. Fore wing fumated throughout but not uniformly. Caudal wings with the blade rather short, narrowing regularly distad and obtusely pointed at apex, bearing a paired line of discal ciliation near the cephalic margin, broadest across apex of the venation, its caudal marginal cilia longer than the longest marginal cilia of the fore wing.

Male :—Unknown.

A genus resembling in habitus *Prestwichia* Lubbock somewhat but more closely *Lathromeris* Foerster and *Pterygogramma* Perkins from both of which it may be distinguished by means of the distinctly 5-segmented antennal club and the presence of two ring-joints. *Trichogrammatella* Girault which also has a 5-jointed antennal club is different from this genus because of its curved venation, unusually long tibial spur of the intermediate legs and in bearing but a single ring-joint in the antennæ.

Type : The following species.

1. LATHROMERELLA FASCIATA new species.

Female :—Length, 0·85 mm.; moderately large for the family.

General color orange-yellow. Abdomen with three conspicuous black stripes across it, the first and broadest (or longest) across the middle, the second midway between it and the third and the latter near apex but not at it. The caudal two of these stripes are about equally wide, each half the width (cephalo-caudad) of the first stripe; tip of abdomen black also, a short yellow space between it and the third abdominal stripe. A small oval or elliptical dusky spot at base of abdomen, in the dorso-lateral aspect; club and proximal half of pedicel dusky; several dusky areas on the mesopleurum; mesoscutum dusky excepting along the median line and the caudal and lateral margins. Marginal vein concolorous with body, but stigmal and submarginal veins dusky black, the former darker and conspicuous. Legs concolorous excepting the black distal tarsal joints and the posterior coxæ and the dusky proximal halves of the femora. Lateral margin of parapsides dusky. Fore wing lightly but distinctly, not uniformly fumated or stained throughout, the staining deeper across the wing under the stigmal vein, clearer under the marginal vein. Caudal wings hyaline. Eyes and ocelli bright red.

Antennal club with the third joint longest and widest, the first shortest and cup-shaped, the distal joint conical. Discal ciliation in the fore wing absent under the venation with the exception of a short proximal extension of several lines near the caudal margin. Mesonotum bearing about six isolated setæ.

(From one specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Male :—Unknown.

Described from a single specimen captured by myself December 16, 1911 from the pane of a window in the kitchen of men's quarters on a sugar farm near Nelson, N.Q. A strikingly marked species, which should be easily recognised. Subsequently, another female was taken in the same vicinity by sweeping in an open forest, February 18, 1912 (A. M. Lea and A.A.G.). The abdominal stripes were less conspicuous, the black on the coxæ and femora was much more distinct, especially on the cephalic legs, while the sides of the thorax were more marked with sooty. Variation therefore is marked.

Habitat : Queensland (Nelson, Cairns District).

Type : No. *Hy/793*, Queensland Museum, Brisbane, one female in xylol-balsam (Dec. 16, 1911).

In the second female captured, the abdomen was conic-ovate but not so slender as in the first.

LATHROMEROIDEA new genus.

1. LATHROMEROIDEA NIGRA new species.

Female :—Length, 0·45 mm.; moderately small for the genus.

General color uniformly black, only the tips of the tibiæ being lighter. Wings hyaline with the exception of nearly all of the posterior wings, which are lightly embrowned and the proximal

part of the fore wing out to the end of the venation and slightly beyond, this portion of the wing being smoky brown, the fumation emphasised under the stigmal vein and diluted under the marginal vein and discally.

With all the essential characters of the genus *Lathromerella*—antennal structure and venation—but the abdomen, though conic-ovate and with the valves of the ovipositor exerted slightly, is not long and slender; with a slightly different habitus from that of the type species of the genus named: Thus the body is much shorter, the fore and posterior wings narrower, their ciliation longer; the oblique line of cilia leading back from the stigmal vein is present. Moreover, the venation resembles more that of *Pterygogramma* in aspect and the antennal club does not terminate in a long seta and most of its joints are wider than long and transverse.

Fore wings moderate in width, regularly rounded at apex, their marginal ciliation moderate in length, twice the length of those cilia in *Lathromerella fasciata*, rather uniform, about a fourth the greatest wing width; the discal cilia arranged in regular radiating lines of which there are about sixteen, the cilia distinct and not very short, the discal ciliation absent under the marginal vein excepting a straight row of about five projected proximad from the caudal margin and near that margin. The oblique line of discal cilia leading back from the apex of the stigmal knob is curved and includes about seven cilia; it is complete in the sense that it joins a reciprocal line of the main ciliation which is projected proximad to meet it. Marginal and submarginal veins subequal, the stigmal vein a mere ovate knob separated from the end of the marginal vein by a constriction. Posterior wings slender and obtusely acuminate and wide across the apex of the venation as in *fasciata*, bearing a distinct, paired line of discal ciliation along the cephalic margin and a single line along the caudal margin (a total of three lines), the caudal marginal cilia nearly as long as the marginal cilia of the fore wing.

Abdomen somewhat longer than the head and thorax combined, yet short and conic-triangular; parapsidal furrows complete; the three tarsal joints moderate in length and subequal but in the cephalic tarsi shorter, lengthening distad, the proximal joint shortest. Tarsal claws well developed. Mandibles apparently tridentate, the two outer teeth distinct, acute.

Antennæ 9-jointed—scape, pedicel, two ring-joints (the certainty of there being two ring-joints has not been established, the single mount showed what appeared to be two), and a 5-jointed club; the latter widest between the second and third joints, the two distal joints longest of the club but only the distal joint, which is conical, is longer than wide.

(From a single specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen mounted in balsam and captured from a window in an empty dwelling at Herberton, N.Q., December 28, 1911.

Habitat: Australia—Queensland (Herberton and Nelson).

Type: No. Hy/794. One female in xylol-balsam (mounted with the female type of *Litus schleideni*). Queensland Museum, Brisbane.

On January 22, 1912, I captured another female specimen of this species at Nelson, N.Q., on a window in the School of Arts. This specimen had the fore wing somewhat narrower and its marginal cilia longer in proportion to its greatest width. I could not verify the antennal structure because those organs shrivelled up as soon as the specimen was mounted in balsam.

2. LATHROMEROIDEA NIGRELLA new species.

Female :—Length, 0.43 mm. ; moderately small for the family.

Resembling closely *nigra* but differing as follows ; The fore wings are distinctly broader and bear relatively shorter marginal fringes ; also their margins are brown, not so in *nigra*, the margins being clear like the general wing surface. The eyes are hairy and the body bears more stiff bristles than does that of *nigra* which is nearly naked.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen taken from the window of an untenanted dwelling at Cooktown, N.Q., January 31, 1912.

Habitat : Australia—Queensland (Cooktown).

Type : No. Hy/795, Queensland Museum, Brisbane, the forenoted specimen in xylol-balsam (mounted with a male *Polynema*).

Both of the above species differ from *Lathromeris* in bearing a somewhat longer marginal vein, an oblique line of discal ciliation, a short, acute abdomen and five antennal club joints ; also the wing ciliation is in regular lines.

The type of the genus is *nigra*.

GENUS TUMIDICLAVA Girault.

1. TUMIDICLAVA CILIATA new species.

Female :—Length, 0.60 mm. ; moderately small for the genus.

Similar to the type species, *pulchrinotum* Girault, but differing in that the yellow median line of the mesoscutum is not perceptible and the scutum caudad is merely edged with yellow ; the tibiae are yellow ; also the marginal fringes of the fore wing are longer, the longest distinctly nearly a third of the greatest wing width. Fore wings distinctly, but not pronouncedly, fumated out to the end of the venation. Distal tarsal joints black.

Fore wings with about thirteen (more or less) longitudinal regular lines of discal ciliation ; scutellum of mesothorax with its caudal margins oblique and straight, terminating in a regular apex of a triangle at the meson. Mandibles tridentate.

(From a single specimen, the same magnification.)

Male :—The same but the abdomen is cylindrical oval, blunt at apex ; antennæ the same. The first male of the genus captured.

(From one specimen, similarly magnified.)

Described at first from a single female specimen captured from a window January 11, 1912 at Innisfail, N.Q. (formerly Geraldton). On January 22, 1912 another female was taken from the window of workmen's quarters on a sugar farm near Nelson, and on the 2nd of February (1912) two more females at Cooktown, N.Q., by sweeping a peculiar grass in a field.

Habitat : Australia—Queensland (Innisfail, Nelson and Cooktown).

Type : No. Hy/796, Queensland Museum, Brisbane, the first female.

Cotypes—In the United States National Museum, Washington, D.C., U.S.A.

This species has nearly the same general color pattern as the single American species of the genus and differs markedly, so far as known, only in bearing longer marginal fringes on the fore wing. Its three club joints and two ring-joints are plainly discernible in the second specimen captured. The stigmal vein is nearly all unicus, the main portion of it merely a bulge from the lower end of the apex of the marginal vein and as described for the type species. Practically, it is absent.

After the above was written I captured another female February 10, 1912 which was crawling over a portion of this manuscript as I sat writing at a table in a hotel at Nelson.

There is some variation in the details of the fore wings. Thus, they are sometimes distinctly broader (as in the Cooktown—and one Nelson—specimen), this broader wing bearing shorter marginal fringes, the latter much less than a fifth of the greatest wing width ; but a graduate form is represented by the specimen captured at Nelson on January 22.

Upon my second visit to Cooktown, on February 24 and 27 (1912), one male and twelve females were captured by sweeping in the same place as formerly.

The discal ciliation of the fore wing in this species is undoubtedly in straight lines.

HAECKELIANIA new genus.

Female :—A genus similar in all respects to *Ufens* Girault but bearing no funicle in the antennæ, the club large, fusiform-acuminate, that is broad at base and tapering to a point at apex, 5-jointed, the proximal joints short and transverse, the apical two joints long and narrow, much longer than wide but not greatly lengthened ; the last joint longest and narrowest, a third longer than the preceding joint ; also the club bears rather long, thick, spinelike setæ somewhat like the single thickened seta from the apex of the club in *Oligosita* but here much longer and acuminate. Scape and pedicel normal. Mandibles with at least three teeth. Marginal and stigmal veins short, the latter slightly shorter than the former. Cephalic tibial spur present, minute, straight and acute. Posterior wings with their caudal marginal cilia longer than the width of the blade. Ovipositor not long, inserted nearer middle than to base, nonexserted. Otherwise as in *Ufens*.

Male :—Not known.

This genus, because of the absence of the funicle, falls in near *Lathromeris* Foerster, from which it is easily distinguished. There is apparently a single ring-joint. The peculiarly shaped club is characteristic but I hesitated for some time before separating it as a distinct segregate from *Ufens* with which I had arranged its type species. The genus is dedicated with great respect to Ernst Haeckel, the most profound philosopher of our times and the one who has, in my opinion, most nearly discovered the truth, the one essential of all philosophy.

Type : The following species (*haeckeli*).

1. HAECKELIANIA HAECKELI new species.

Female :—Length, 0·80 mm. ; large for the family, but not as robust as *Ufens hercules*. General color deep black, only the knees, tips of tibiae and all of the tarsal joints being pallid yellow, the body unmarked with yellow or brown. Mandibles fulvous, fuscous at tips. Proximal half (approximately) of fore wing lightly stained a smoke color, the fumation extending out about the length of the stigmal vein distad of the end of the marginal vein.

A species at once characterised by the uniform blackness of its body and the peculiar shape of the antennæ and its conspicuous clothing. Thus, the funicle and club of this organ are not differentiated but apparently form one piece which is acuminate-conical or broad proximad and tapering out to a point distad ; the pubescence is scattered each hair enlarged into a seta and long like those on the male antennæ of *Trichogramma* ; but here, the setæ are stouter ; they are much larger than those of any other species of the family with the possible exception of the male of *Trichogrammatoidea* ; moreover, the first or proximal joint of the club is transverse, much shorter than either of the two distal joints. From *Ufens piceipes*, this species differs in bearing less dense discal ciliation on the fore wing and longer marginal cilia on the same wings ; its stigmal vein is shorter ; the other differences are obvious. From *Ufens niger*, in nearly the same points but the stigmal veins of these two (*niger* and *haeckeli*) are more similar. Also this last statement is true for *Ufens flavipes* ; but the discal ciliation in *flavipes* is more like that of *haeckeli* whereas the latter has longer marginal cilia on the fore wing and along the caudal margin of the posterior wings. This species has a shorter stigmal vein, narrower wings, longer caudal marginal cilia on the posterior wings and less hispid posterior tibiae than the species *hercules* ; besides it has no yellow at the base of the abdomen. The fore wings bear about eighteen lines of discal cilia, the oblique line of discal cilia leading from the stigmal vein includes only about seven cilia ; the caudal marginal cilia of the moderate-sized posterior wings are distinctly longer than the greatest width of the blade. Mandibles tridentate. Marginal vein of fore wing but slightly longer than the stigmal vein. The distal club joint of the antenna apparently divides at apex into two of the large setæ which diverge. Strigils absent. Ovipositor not exerted.

(From one specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen remounted in balsam from alcohol and captured from a window at Herberton, N.Q., December 28, 1911. (A.A.G.) Dedicated to Ernst Haeckel.

Habitat : Australia—Herberton, Queensland.

Type : No. Hy/780, Queensland Museum, Brisbane, the forenoted female on a slide (mounted with *Stethynium* and *Litus*).

GENUS PTERYGOGRAMMA Perkins.

1. PTERYGOGRAMMA DUBIUM new species.

§ In spite of the enormous differences pointed out herewith between the following species captured at Nelson, N.Q., December 5, 1911 from the panes of a window in men's quarters on a sugar farm, and the original description of the genus, I am quite satisfied that the identification is correct. Perkins' description of the genus must have been founded upon greatly distorted specimens. It must be inaccurate (see beyond).

Female :—Length, 0.70 mm. ; moderately large for the family.

General color ashy black, marked with pale cadmium-yellow as follows : Vertex and whole dorsal aspect of the thorax ; the mesoscutum is marked however with the general color of the body—a rather broad but short line (somewhat over twice longer than wide) down each side of the median line which joins cephalad with similar coloration along the lateral margins of the sclerite at cephalic three fourths. The sides of the thorax marked more or less with paler yellow. Antennæ and femora concolorous with the body ; all of tarsi, ends of the femora, the trochanters and all of tibiæ except exteriorly (laterally) along the edge (concolorous with body) pallid yellowish ; two proximal joints of antennal club suffused with yellowish ; coxæ blackish. Venation dusky with a tinge of yellowish.

Fore wings nearly uniformly, moderately fumated throughout but there is a darker spot at the knob of the stigmal vein, a larger darker area just caudad of the break of the submarginal vein extending about for equal distances proximad and distad along the caudal wing margin and another area at the caudal wing margin just in a line caudad of the substigmal spot and separated from a suffused extension of this and the caudal area under venation by an oblique clearer line (running distad with a slight cephalic inclination). Eyes and ocelli bright red. Caudal wings uniformly fumated.

I cannot reconcile this specimen with the original description of *acuminatum* from which I was forced to separate it. Colorationally, it appears to agree tolerably well with Perkins' description though the fore wings are plainly fumated throughout ; the mesoscutum and head are not brownish. Structurally, it differs as follows from the description given of the type species of the genus : The head is not strongly transverse and the ocelli are in a short triangle, the lateral ocelli not touching the eye margins but distant from them, distinctly farther from them than they are from each other. The 3-jointed antennal club is conic-ovate, widest at the first articulation as originally described but not widely dilated, normal in shape, the terminal joint conical as usual and not terminating in a stiff seta. The metanotum does not extend over the base of the abdomen, nor is the latter twice the length of the thorax but about one and a half times longer. The ovipositor is not exerted at all but the valves plainly project beyond the apex of the abdomen to a

length about equal to the length of the intermediate joint of the tarsi, somewhat as in *Neotrichogramma* Girault, not exerted for a length equal to that of the hind tarsi, which would be between a third and a half of the length of the abdomen. The abdomen is not compressed but normal and regularly conic-ovate. The fore wings bear eleven or twelve distinct lines of discal cilia, some of which may be composed of not more than three cilia; the stigmal vein bears a distinct uncus, not shown in the figure of *acuminatum* and the fore wings exceedingly short marginal fringes, barely visible ($\frac{2}{3}$ -inch objective), nearly uniform in length, extending all around the margin of the distal half of the wing (distad of the venation) and each cilium no longer than the individual discal cilia; thus, they are not merely short as figured for *acuminatum* and plainly visible; in fact the marginal cilia are barely differentiated from the edge of the wing, especially along the apex (see remarks beyond and on *acuminatum*). Otherwise, the figure of the fore wing of *acuminatum* agrees with the fore wing of this species but the neck of the stigmal vein is slenderer here. The caudal wings in this specimen are moderate and uniform in width, not acuminate, obtusely pointed at the apex, bearing but a single line of discal ciliation which is somewhat cephalad of the midlongitudinal line of the wing; along the caudal margin, the marginal cilia are long, about two and a half times the width of the blade, the cilia of the cephalic margin not extremely short, distinct but only about three fourths the width of the blade. Marginal vein of fore wing long but shorter than the submarginal. The parapsidal furrows are complete. Tibial spurs single, moderate in size for the family, not as long as the proximal tarsal joint, on the cephalic legs absent; strigil absent; mesophragma present. Tarsal joints moderate, subequal, in the cephalic legs shorter and subequal. Legs normal. Mandibles apparently with four unequal teeth.

Antennæ normal, 6-jointed, inserted below the middle of the face; scape, pedicel, *1 ring joint*, which is inconspicuous being both short and narrow and hidden and a normal, conic-ovate, 3-jointed club, the intermediate joint of which is longest. Scape normal, cylindrical, not slender; pedicel moderately stout, usual, obconic, two thirds the length of the scape and as long as the intermediate club joint but not as broad. Club not terminating in a seta of any sort.

(From one specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Male :—Unknown.

After making the above descriptive notes which are correct for the natural insect, I crushed the specimen on a slide (formerly lying in balsam naturally, that is, not crushed by the cover glass) whereupon the antennal club took the compressed and dilated form figured by Perkins and the minute ring-joint came into view. It is doubtless true, therefore, that the original description of the genus and species was based upon crushed specimens in balsam and thus is distorted more or less fantastically. There is an oblique line of discal ciliation in *dubium* leading back from the stigmal vein of the fore wing, consisting of 2-3 cilia, which are no longer than the other discal ones. The caudal femora have a polygonal, scaly sculpture. The antennæ are similar to those of *Uscana semifumipennis* Girault and *Pterygogramma* resembles *Uscana* in other respects; however, the

sparsely ciliated fore and posterior wings, the longer marginal vein of the fore wing (distinctly shorter than the submarginal in *Uscana*) and the longer, more pointed abdomen with the plainly exerted valves of the ovipositor are characteristics separating the two.

Habitat : Australia—Queensland (Nelson).

Type : No. *Hy/790*, Queensland Museum, Brisbane, the above female in xylol-balsam (mounted with a homotype female of *Aphelinoidea howardii*).

Since the above was written I have captured another female specimen of the genus from the same window, December 9, 1911. This specimen bore the distinct but short marginal ciliation as figured in the original description of *acuminatum* by Perkins ; otherwise, it could not be separated from the species described above, excepting that the discal cilia were in better condition ; thus along the cephalic wing margin is a straight paired line (the caudal line more regular, not confused with the margin) running directly from the apex of the marginal vein. Although these two specimens may be considered the same species, yet it is indeed remarkable how all the marginal cilia of the fore wing could have been so neatly severed from *dubium* in such a manner as to leave no trace of them ; and this is the more remarkable since the marginal ciliation of the caudal wings was uninjured and perfect. This fact is inexplicable on any other supposition than that the two specimens belong to distinct species of the genus and I shall so treat them for the present. The second specimen was *acuminatum*.

2. PTERYGOGRAMMA ACUMINATUM Perkins.

Perkins, 1906, p. 265, pl. XX. fig. 7 ; also introduction, p. xxvi.

“ Bundaberg, Queensland, from jassid eggs embedded in twigs of Eucalyptus.” “ Eggs of *Partessus syrtidis*.”

As recorded above I captured a single female specimen of this species on a window in men's quarters on a sugar farm at Nelson, N.Q., December 9, 1911. It was captured in practically the same place as was the specimen of *dubium*. Another female was taken in the same place, December 18, 1911. The species is similar to *dubium* except as pointed out above and as follows : The oblique line of discal cilia leading from the stigmal vein bears from 4-5 cilia which are distinctly longer than the other discal cilia, at least twice the size. The neck of the stigmal vein is slenderer and thus more distinct and its knob is less rounded, more ovate. The whole of the mesonotum (including mesophragma) appears to be very finely, densely, longitudinally striate (in reality, densely minutely roughened or alutaceous) but not so with *dubium* ; the caudal femora in *acuminatum* bear little or no polygonal sculpture. The fore wings are not so plainly and uniformly fumated as in *dubium*, their distal thirds clear or nearly. The species occurs at least in Bundaberg and Nelson, Queensland. The male of this genus was thought to be represented by the following species which, however, was found to be a female.

3. *PTERYGOGRAMMA SEMIFUSCIPENNE* new species.

Female :—Length, 0.60 mm. ; moderate in size for the genus.

General color black, the vertex and the whole of the dorsal aspect of the thorax lemon-yellow ; antennæ greyish ; legs black excepting trochanters, knees, distal ends of tibiæ and all tarsal joints which are white. Eyes and ocelli carmine. Sheaths of the ovipositor black. Fore wings deeply fumated proximad, the fumated area conspicuous and extending slightly beyond the tip of the stigmal vein, absent in the space between the latter and the cephalic wing margin. Distal third (or over) of fore wing clear.

Similar to the other species of the genus, *acuminatum* and *dubium*. At once distinguished from the latter by reason of the presence of marginal fringes on the fore wing and the nonuniformity of the fumation of that wing ; also in the more colored legs, especially posteriorly. From *acuminatum* this species differs in that the marginal cilia of the fore wing are longer, the fumation of that wing much more pronounced and more clearly limited, not extending distinctly distad of the apex of the stigmal vein and the proximal joint of the intermediate tarsi is not so long and slender as in *acuminatum* and *dubium* ; moreover, in regard to the latter, a distinct rounded area of minute discal cilia situated nearer the caudal margin under the middle of the marginal vein in *semifuscipenne* but farther disto-caudad in *acuminatum*, is much less noticeable if not absent ; at least the minute cilia are fewer and scattered. The posterior marginal cilia of the *posterior* wing are longer in *acuminatum*. About eleven lines of discal ciliation in the fore wing ; the oblique line leading back from the stigmal vein with only about three cilia which are intermediate in size between those of either *acuminatum* or *dubium*.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen mounted in balsam when alive, and captured from a window in the School of Arts at Nelson, N.Q., January 25, 1912. (A.A.G.)

Habitat : Australia—Queensland (Nelson).

Type : In the Queensland Museum, Brisbane, No. *Hy/792*, the foregoing female on a slide.

DIAGNOSIS OF THE SPECIES OF *PTERYGOGRAMMA* PERKINS.

FEMALES.

Ovipositor long, that is inserted far up near the base of the abdomen and distinctly exerted at apex.

1. Fore wings with comparatively sparse discal ciliation, the lines some distance apart and not more than a dozen in number. Posterior wings with but a single line of discal ciliation. Substigmal spot more or less visible.

Marginal fringes of the fore wing practically absent, extraordinarily short ; fore wing slightly fumated throughout ; oblique line of discal cilia leading back from the stigmal vein not conspicuous and including not more than three cilia, which are not much larger than the other discal cilia. Mesonotum not longitudinally striate. Caudal coxæ polygonally sculptured!

dubium Girault.

- Marginal fringes of the fore wing distinct, moderately short ; fore wing fumated only out slightly beyond the venation ; oblique line of discal cilia rather conspicuous, each cilium distinctly larger than the other discal cilia ; mesonotum apparently finely, longitudinally striate ; caudal coxæ not sculptural polygonally *acuminatum* Perkins.
- Marginal fringes of fore wing longer ; fore wing pronouncedly fumated but only out to the apex of the stigmal vein. Posterior tibiæ nearly all black . . . *semifuscipenne* Girault.

GENUS USCANA Girault.

1. USCANA GALTONI new species.*

Female :—Length, 0.55 mm. ; smaller than the type species ; the abdomen more rounded, the ovipositor not exerted, the fore wings smaller and more densely and irregularly ciliate discally as compared with the species of *Pterygogramma*.

General color dusky, the vertex and mesonotum yellowish ; ocelli and eyes bright red, legs concolorous but trochanter, knees, distal third of tibiæ and proximal two tarsal joints pallid. Antennæ concolorous. Fore wings dusky or fumated out to the end of the venation, the remaining portion clear. Abdomen with faint, dusky transverse stripes.

Genitalia consisting of a needle-like ovipositor which arises at the distal two thirds of the venter from between two plates, and which project slightly beyond the apex of the abdomen ; this organ thus appears very much like the ovipositor in the females of *Trichogramma*.

As concerns this specimen the probabilities of its being (1) a male of *Pterygogramma*, or (2) the female of this genus distinguished from *Pterygogramma* by its short ovipositor should constantly be held in mind here. The last probability is the more certain and its characteristics appear to be due to specific distinctness rather than sexual.

The antennæ are like those of *Pterygogramma*, but the fore wings differ in discal and marginal ciliation. In regard to the former there are about eighteen lines which give the blade of the wing more the appearance of a *Trichogramma* than of *Pterygogramma* ; moreover the oblique line of discal cilia leading back from the stigmal vein includes five cilia and the line is curved and the cilia themselves no larger than those of the main discal ciliation. The marginal cilia differ from those of the female *Pterygogramma* in that they are less dense and shorter, arranged in fact as in *Trichogramma*. The venation agrees with that of *Uscana*. The posterior wings bear three lines of discal ciliation the first two paired and resembling the single line present in *Pterygogramma* ; but the third line is less distinct and has the cilia placed farther apart in the line. The marginal cilia of the posterior wing are shorter than with the last-named genus.

(From one specimen, same magnification.)

Male :—Unknown.

Described from a single female specimen captured October 6, 1911 from the windows of a barn on a wheat farm at Roma, Queensland.

* This species was at first taken to be a *Pterygogramma* ; it differs from the type of its genus in being lighter in color, in bearing somewhat longer marginal cilia on both wings and narrower fore wings which are more regularly fumated.

Subsequently a second female was taken from a window in a hotel at Nelson, N.Q., January 26, 1912 (Cotype in U.S.N.M.).

Habitat: Queensland (Roma and Nelson).

Type: No. Hy/791, Queensland Museum, Brisbane, one female in xylol-balsam, Nelson.

Dedicated to Francis Galton.

GENUS APHELINOIDEA Girault.

1. APHELINOIDEA HOWARDII new species.

Female:—Length, 0.60 mm. ; moderate for the genus.

The same as *Aphelinoidea semifuscipennis* Girault in general coloration and appearance but differing in the following details. The fuscation of the fore wings is lighter, less distinct and only accented in a transverse dash leading out from the stigmal vein ; it also extends somewhat less farther distad, only to the end of the venation, not a little distance beyond it. The whole of the dorsal aspect of the thorax is bright lemon-yellow, the vertex also, while the antennæ are dusky, with the proximal club joint and distal half of pedicel pallid yellowish ; coxæ and femora dusky, the remaining portions of the legs mostly pallid.

The fore wings themselves are distinctly broader, bearing about thirty or more lines of discal cilia across their widest portion (in the type species only about twenty), broadest at their distal fifth (farther out toward the apex than in the type species) ; they also bear distinctly shorter marginal cilia, the longest (disto-caudad) not more than a twentieth of the wing's greatest width, very short (about twice the size of the discal cilia). The posterior wings also differ in bearing slightly shorter marginal cilia, in being distinctly broader and less acuminate and in bearing five lines of discal ciliation instead of three (one near the cephalic margin—the very short marginal cilia appearing as if paired with it—a second line paired along the distal half of the blade and a line near the caudal margin also paired along the distal half of the blade, making three complete lines and two half lines). The marginal ciliation of the posterior wing along the cephalic margin is shorter than with *semifuscipennis*. Distal tarsal joints dusky. Discal ciliation with a few lines occasionally regular. Otherwise approximately the same as the type species with which it is closely allied. A very beautifully marked species.

Male:—Unknown.

Described at first from a single female specimen captured from the panes of a window in a barn at the State Farm, Roma, Queensland, October 6, 1911. Respectfully dedicated to Dr. Leland Ossian Howard, Chief of the Bureau of Entomology, United States Department of Agriculture, Washington, D.C., U.S.A., whose broadmindedness has helped very much to advance science, applied and otherwise.

Habitat: Australia—Queensland (Roma, Nelson, Mareeba, Yungaburra and Tolga.

Type: No. Hy/797, Queensland Museum, Brisbane, one female (Roma) in xylol-balsam.

Subsequently, I captured two more females from a window in men's quarters on a sugar farm just outside of Nelson, N.Q., December 4 and 5, 1911 and one in a spider's web, same situation, December 17, 1911. Also two more of the same sex in the same place, December 21, 1911 and January 4, 1912; also a female at Tolga, December 28, 1911. On January 2, 1912, a seventh female was captured from the panes of a window in a carhouse at the depot at Mareeba, N.Q. Two females captured at Yungaburra, December 30, 1911 from a window were overlooked.

2. APHELINOIDEA SPECIOSISSIMA new species.

Female:—Length, 0.85 mm.; large for the genus. Fore wings with the apical third fuscous, then crossed by a hyaline band.

General color velvety black, marked with contrasting bright lemon-yellow as follows: The vertex and all of the dorsal aspect of the thorax (excepting pronotum, which is dusky) and base of abdomen (continuously), a rather large subquadrate spot along the dorso-lateral aspect of the abdomen about midway between the caudal margin of the yellow of the base of the latter and the apex and a much smaller spot, a dot, directly caudad of the centre of the large spot and distant about the width of the latter; also ventral third of face and the scape. Antennæ (excepting scape) and a broad band between the eyes, dusky; legs black, or nearly, the trochanters, knees and tips of tibiæ pallid yellow, the tibial tips nearly white, the latter color extending the whole of one aspect of the cephalic and intermediate tibiæ; tarsi yellow, the distal joints slightly darker. Eyes and ocelli ruby red. Tip of the valves of the ovipositor black, the ovipositor itself yellowish. Fore wings characteristic, fuscous but crossed at the apex of the venation by a broad hyaline band which expands caudad from each of its sides. The outer third or more of the wing is clouded, followed by the hyaline band; then the inner third or more of the wing is clouded but less uniformly, the fuscation accented in a crescentic comet-shaped area with its tail emerging from the caudal wing margin and its head entering at the apex of the venation; this accentuation coincides with the proximal margin of the discal ciliation. Proximad, most of the naked base of the wing appears to be subhyaline. Apical two thirds of the marginal vein black, proximal third yellowish white, remaining venation dusky yellowish. The yellowish white proximal third of the marginal vein contrasts. Venation of posterior wing dark. Posterior wings hyaline.

Fore wings very broad, pyriform, oblatly rounded at apex, only about one and a half times longer than broad, for the genus its marginal cilia very short, barely differentiated as in *Ufens*, its discal ciliation dense and fine, normal, but proximad in the fuscous comet-like area distinctly coarser but as dense, terminating near the caudal margin of the wing, opposite the middle of the submarginal vein, in a sharp point drawn out in a line of two or three cilia which points up toward the venation; under the latter, the wing is naked. The discal ciliation is distinctly less dense in the hyaline band and there the cilia commence to enlarge somewhat. Fore wings bearing about from 45-50 longitudinal lines of discal cilia across its widest blade portion. Marginal vein of fore wing distinctly shorter than the submarginal vein, rather broad, somewhat less elliptical ovate in shape and at the apex terminating abruptly in a small, sessile, knob-like stigmal vein which

appears like a drop of liquid adhering to the disto-caudal angle of the marginal vein. The stigmal vein, however, bears a rather prominent uncus which points disto-cephalad. The distal, black portion of the marginal vein bears a rather dense mass of stiff black bristles which are arranged in four or five longitudinal rows; the submarginal vein bears four or five bristles, scattered along it, the first (distal) two largest. Posterior wings rather broad, poniard-shaped, acute at apex, bearing three very distinct longitudinal lines of discal cilia, the lines complete, all meeting at the apex, the first directly at the cephalic edge of the blade, the second cephalad of the midlongitudinal line of the wing blade, broken or somewhat irregular before reaching apex, the third line longest, some distance out from the caudal wing margin. Marginal cilia at cephalic margin normal, short, slightly shorter than the marginal cilia of the fore wing (apex); those of the caudal margin moderately long, slightly longer than the greatest width of the blade, very much longer than those of the cephalic margin but at the apex only slightly longer than the short cilia of the cephalic margin. Venation of posterior wing clavate.

Tarsi 3-jointed, the joints of the intermediate tarsus longer than those of the others, moderately long, slender and subequal, the proximal joint thickest; joints of the other tarsi averaging about a third shorter, lengthening distad, the distal two joints subequal and longer than the proximal joint. Tibial spurs single, the cephalic one very minute (the strigil absent), the caudal one moderate in size, moderately small but the intermediate one long and slender, acuminate, about as long as the intermediate tarsal joint of either the cephalic or caudal legs. Legs normal. Parapsidal furrows complete; femoral impression absent. Abdomen about as long as the head and thorax combined, rather stout, conic-ovate, pointed at apex, the valves of the ovipositor projecting slightly beyond. Eyes naked; ocelli in a triangle in the centre of the vertex, all much closer to each other than any are to the eye margins. Mandibles with three teeth, the two outer (lateral) of which are acute, the third shorter and obtuse.

Antennæ 5-jointed—scape, pedicel, one ring-joint and a 2-jointed, conic-ovate and somewhat stout club; scape compressed, subequal to the distal club joint; pedicel long, obconic, two thirds the length of the scape; club stouter, shaped somewhat as in *Chætostricha flavipes* (Girault), its proximal joint forming a fourth of its length, subhemispherical, the distal joint conical, terminating acutely, broad at its base. Pubescence moderate, scattered.

Body bearing stiff bristles. In the discal ciliation of the fore wing there is one more or less distinct, straight line of cilia originating at the junction of the proximal fuscated area with the caudal wing margin and running straight distad to about the middle of the distal fuscated area where it becomes lost in the ciliation. Tarsal claws present.

Male :—Unknown.

Described from a single female specimen captured by sweeping low vegetation in a denuded gorge, a short way up the side of Pyramid Mountain, Nelson (Cairns District), N.Q., November 21, 1911. Afterward, another female was captured by sweeping in an open forest near Nelson, January 29, 1912. The yellow areas on the abdomen were not quite so conspicuous in this specimen.

Habitat : Australia—Queensland (Nelson). Elevation about 300 feet.

Type : No. *Hy/800*, Queensland Museum, Brisbane, one female in xylol-balsam (November 21, 1911).

This extremely beautiful species differs markedly from the other species of the genus—*semifuscipennis* Girault and *howardii* Girault—as may be seen by consulting their descriptions. From *semifuscipennis*, besides its general color, it differs in having broader posterior wings, much broader fore wings, especially more broadly, flatly rounded at apex, in bearing shorter marginal cilia on the fore wing, in being much larger and in its whole general appearance. From *howardii*, structurally, it differs also in being larger and more robust, in having the fore wings broader and more flatly rounded at apex, the ciliation denser but it is more like *howardii* than *semifuscipennis*. It bears less discal ciliation in the posterior wing than does *howardii*.

3. APHELINOIDEA WEISMANNI new species.

Female :—Length, 0.35 mm. ; small for the genus.

A species similar to the type species, the American *semifuscipennis*, but differing in coloration in having the proximal joint of the antennal club pallid forming a conspicuous pale ring around the base of that segment of the antenna. Also, the fumation of the fore wing extends only to the end of the venation, not slightly beyond it, and all tibiae and tarsi are pale yellowish and the scutellum, knees and trochanters, the scutellum more yellowish, lemon-yellow. Structurally, *weismanni* differs from the type species in bearing somewhat narrower fore wings which have shorter marginal ciliation, the longest only about three fourths the length of the longest marginal cilia of the fore wings of *semifuscipennis* ; the discal ciliation of the fore wings in the latter species are also somewhat coarser and there are several more lines across the widest blade portion. Otherwise, the same as *semifuscipennis*.

Male :—Unknown.

Described from a single female specimen captured from the windows of a barn on a wheat farm near Roma, Queensland, October 6, 1911.

Habitat : Queensland (Roma).

Type : No. *Hy/799*, Queensland Museum, Brisbane, the forenoted female on a slide.

Respectfully dedicated to Professor August Weismann of Freiburg for his part in stimulating the philosophy of biology.

4. APHELINOIDEA HUXLEYI new species.

Female :—Length, 0.55 mm. ; moderate in size for the genus.

The same as *howardii*, but the dorsal aspect of the thorax is darker, more brown, instead of bright yellow, the tibiae nearly all black and the tarsal joints shorter.

(From a single specimen, the same magnification.)

Male :—Unknown.

Described from two female specimens mounted in balsam and taken from the windows of a granary on the State Farm, Roma, Queensland, 6 October, 1911. Also one female, Yungaburra, N.Q., December 30, 1911 and another at Mareeba, N.Q., 2 January, 1912, both on windows.

Habitat : Queensland (Roma, Yungaburra, Mareeba).

Type : No. Hy/798, Queensland Museum, Brisbane, one female on a slide (Roma).

This is probably a color variant of *howardii*.

Dedicated to Thomas Henry Huxley for his dogged courage, tenacity of purpose and insistence on truth.

5. APHELINOIDEA PAINEI new species.

Female :—Length, 0.50 mm; moderate in size for the genus.

General color bright orange-yellow, the sides of the thorax dusky; antennæ and legs paler yellow, both suffused somewhat with dusky; eyes and ocelli bright red; wings hyaline but sooty at base out just not quite to the apex of the venation, the fumation accented distad, especially just under the apex of the marginal vein. Vertex dusky and with a number of scattered, minute black dots. Sheaths of ovipositor dusky. Venation yellow, excepting the sooty marginal vein.

Differs from all members of the genus in being mostly yellow, the abdomen entirely yellow, the legs only lightly dusky on the femora and tibiæ. Nearest structurally to *howardii* and *huxleyi*, the posterior wings bearing five lines of discal ciliation and the fore wings of about the same width. From *howardii* it differs in having the antennal joints all shorter and stouter, the marginal ciliation of the fore wings somewhat longer; from the other species—*huxleyi*—in the same particulars. Thus, its coloration mostly distinguishes it.

(From a single specimen, the same magnification.)

Male :—Not known.

Described from one female specimen, mounted in xylol-balsam, captured at Nelson, N.Q., April 10, 1912 from the panes of a window in men's quarters on a sugar farm.

Respectfully dedicated to Thomas Paine, one of the manly defenders of truth and reason and author of the Rights of Man and the Age of Reason.

Habitat : Queensland, Australia (Nelson near Cairns).

Type : The above female in the Queensland Museum, Brisbane, No. Hy/990; mounted with a female of *Neobrachista fasciata* Girault, captured at the same time.

DIAGNOSIS OF THE AUSTRALIAN SPECIES OF APHELINOIDEA GIRAULT.

1. Fore wings fumated both proximad and distad, a hyaline band separating the two fumated areas at about the middle of the wing or more distad; a large naked area under the venation bounded caudad by sharply delimited discal ciliation. Posterior wings broad.

- Dorsal aspect of thorax, abdomen at base, vertex and a large subquadrate spot along dorso-lateral aspect of the abdomen bright lemon-yellow ; legs black, but knees, trochanters, tips of tibiæ pallid, the tarsi yellow. *speciosissima* Girault.
2. Fore wings fumated proximad only ; no discal ciliation under the venation, excepting two or three cilia. Posterior wings moderately narrow.
- Posterior wings broader, bearing five lines of discal ciliation ; antennal club yellowish. Fore wings broad, bearing about thirty lines of discal ciliation across their widest blade portion.
- (a.) Abdomen black.
- Dorsal aspect of thorax and vertex yellow ; coxæ and femora blackish, the knees, tibiæ and tarsi (excepting distal joint) pale yellow to silvery white ; robust *howardii* Girault.
- Dorsal aspect of thorax darker, brown, verging to yellow caudad ; coxæ, femora and tibiæ black, white only at tips *huxleyi* Girault.
- (b.) Abdomen bright orange-yellow.
- Body all bright orange excepting sides of thorax, femora and antennæ which are suffused with dusky. Legs pallid *painei* Girault.
- Posterior wings narrower, bearing but three lines of discal ciliation ; antennal club with the proximal joint pallid white, the distal joint dusky yellow. Fore wings comparatively narrow with only about eighteen lines of discal cilia.
- Scutellum of thorax yellow ; coxæ and femora slightly dusky, the remaining portions of the legs pallid. Small *weismanni* Girault.

SUBFAMILY TRICHOGRAMMATINÆ Girault.

TRIBE TRICHOGRAMMATINI Girault.

GENUS TRICHOGRAMMA Westwood.

1. **TRICHOGRAMMA AUSTRALICUM** new species.

A single male specimen of this species was captured by sweeping grass on sand along the left bank of the Pioneer River, Mackay, Queensland, October 15, 1911. A second specimen, a female, was captured by sweeping along the grassy margin of a (then) dry brooklet along the east bank of the Mulgrave River, near Pyramid Mountain, Nelson (Cairns), November 25, 1911. Three days later, another female was captured in bright sunlight, late afternoon. She was found ovipositing into a lepidopterous egg (presumably of a butterfly) which had been deposited upon the under surface of a low weed growing along the margin of a canefield. When captured by inverting a vial over it, the host egg was also introduced and though loose in the vial and the latter had been shaken up considerably, several minutes afterwards the little parasite was busily ovipositing into it again. The habitat at each place of capture was nearly similar, sand along a river, among lowly plants and grasses.

The species first identified as *minutum* Riley, the commonest member of the family, cannot be considered that species, since it differs as follows : The cephalic line of discal cilia of the caudal wing is absent, a characteristic which distinguishes this species from *retorridum* (Girault) ; the curved oblique line of discal cilia leading back from the stigmal vein includes not more than three

cilia, usually two (but sometimes five) ; the funicle joints of the antennæ are both wider than long ; the antennal pedicel is distinctly longer than the funicle, subequal in *minutum* ; the irregular patch of discal ciliation at the apex of the fore wing between the fourth and fifth regular lines (counting from cephalic margin) is absent. Otherwise (male and female) as in *minutum*. Colors : Dusky black, the scutellum, metanotum and vertex bright orange-yellow ; eyes and ocelli red ; fore wings fumated proximad as in *minutum*. Appendages dusky. Male the same. The fore wings bear about from 12-14 longitudinal lines of discal ciliation.

(From three specimens, the same magnification.)

Described from one male and two females captured as noted above and mounted in xylol-balsam.

Habitat : Australia—Queensland (Mackay, Mareeba, Innisfail, Herberton, Nelson).

Types : No. *Hy/801*, Queensland Museum, 1 ♂, 1 ♀ in xylol-balsam, two slides.

Subsequently I captured a fourth specimen, a female, taken from the panes of a window in men's quarters on a sugar farm near Nelson, December 9, 1911. This specimen differed from the others in being nearly uniformly yellow, and in having five cilia in the oblique line leading back from the stigmal vein. Another specimen, like the first ones, and a female was taken December 26, 1911 from the window of a foundry at Mareeba, N.Q.; two females were captured from the window of an empty dwelling at Herberton, N.Q. December 28, 1911 ; these specimens had longer marginal fringes on the fore wing disto-caudad, but the length of these fringes varies with the species of this genus if not in all genera of the family. On January 9, 1912, a male was captured while crawling over the panes of a window in a hotel at Cairns ; and on the 11th a female from another window at Innisfail (formerly Geraldton). Thus, the species appears to be rather common along the east coast of Queensland. More recently, a male specimen was taken at Cooktown, N.Q., February 3, 1912 from a window in an empty dwelling ; and at the same place, three females from a window in a hotel, February 6, 1912 ; and two others from the same window two days previously. These were all typical specimens.

A male was also captured at Nelson from a window, April 10, 1912, and a pair, April 23. Still later, a male at Nelson on April 30, 1912 by sweeping in a forest, a female May 24 in the same place and a female from a window, June 14, 1912.*

2. TRICHOGRAMMA MINUTUM Riley.

This widely distributed, hence variable, species I think has been recorded from New Zealand but I am unable to give the citations here. However, as I treat fully of the distribution of this species in a paper which should have been already published in the Bulletin of the Wisconsin Natural History Society, Milwaukee but which I have not seen and thus cannot cite definitely, it is unnecessary to go farther into the matter here. A number of its hosts occur in New South Wales but I have not seen *minutum* in Queensland.

* On July 3, 1912, I captured a female by sweeping grass over a small bog along the bank of a narrow forest stream near Nelson ; the stream itself was clothed narrowly along each side with typical jungle which gave way to forest a short distance from the water.

A month or two later, however, I captured a female of it at Rossville, N.Q., on a window, February 23, 1912. It was compared with North American specimens.

PARATRICHOGRAMMA new genus.

Female :—Head normal, the eyes large, the antennæ inserted ventrad of the middle of the face, 5-jointed—scape, pedicel, a ring-joint which is very minute, a subquadrate funicle joint smaller than the pedicel and a subpetiolate, short, solid, broadly ovate club. Mandibles tridentate, weak. Body short and rather compact, as in *Trichogramma* Westwood, the thorax and abdomen subequal in length, the parapsidal furrows complete, the mesoscutum large, cuneate, widest cephalad, over twice the length of the mesoscutellum which is subhemispherical, thus wider than long. Mesophragma penetrating half of the abdomen. Ovipositor not exerted, inserted slightly distad of the apex of the proximal half of the abdomen. The latter ovate to subcylindrical, sessile.

Fore wings nearly as in *Trichogrammatoidea* Girault, their discal ciliation sparse but arranged in regular radiating lines, the oblique line of cilia running back from the stigmal vein absent, the marginal cilia short. Venation forming a flat bow and not approaching the costal wing margin, rather peculiar, the submarginal vein long, apparently breaking or curving twice before reaching the marginal but in reality changing angle at its distal two thirds and there thickening and becoming colored, resembling closely the stigmal vein; between the clavate end of the submarginal vein and the foot-shaped clava representing the stigmal vein is the colorless, gently curved, slenderer marginal vein; the latter is shorter than the stigmal vein which in turn is only two thirds the length of that part of the submarginal vein distad of its curve; the stigmal vein bears three prominent setæ (plus several others), the distal end of the submarginal vein two. Fore wing fumated proximad. Posterior wings moderately broad, posteriorly with long marginal cilia and with but a single, inconspicuous line of discal cilia. Tarsi 3-jointed, the joints moderate in length and subequal, those of the cephalic legs shorter, the proximal joint somewhat the shortest of the three; strigils absent; tibial spurs single, moderate in length, those of the intermediate legs longest, somewhat over two thirds as long as the proximal joint of the intermediate tarsi.

Male :—Unknown.

A genus resembling and allied with *Trichogramma* Westwood from which it differs in bearing an undivided funicle and less strongly developed venation, the stigmal vein being practically but a clavate ending of the marginal vein. It appears to be a more primitive type than *Trichogramma* or rather a more recent one, the funicle being reduced to one joint and the venation degenerated.

Type : The following species.

1. PARATRICHOGRAMMA CINDERELLA new species.

Female :—Length, 0.60 mm.; moderate in size for the family.

General color dusky yellowish, the color irregular, more yellowish in some places (around the mouth and eyes, at base of abdomen), the legs and antennæ dusky or greyish black, in the former excepting the trochanters, knees, distal fourth of tibiæ and proximal two tarsal joints

which are pallid or whitish ; club of antennæ with some yellowish along the edges. Venation pallid, excepting the brownish yellow distal end of the submarginal vein and the stigmal vein. Fore wings fumated proximad out as far as the middle of the marginal vein, the fumation sooty black and not uniform, the rest of the wing very clear. Eyes bright red. Caudal wings colorless.

Sculpture of the body inconspicuous, that of the mesonotum, however, alutaceous, traced with irregular polygonal areas. Fore wings with about five radiating, regular lines of discal ciliation running from the apex and none long. Marginal cilia of fore wing longest disto-caudad, there twice longer than the very short cilia disto-cephalad and at extreme apex. Caudal wings transparent, except the yellowish apex of the venation and at extreme base, subpetiolate, the portion of the wing proximad of the end of the venation slenderer but not extremely so, the blade moderately wide, without discal ciliation, excepting a colorless line along the cephalic margin, the marginal cilia caudad long, one and a quarter times the greatest width of the blade.

(From one specimen, same magnification.)

Male :—Not known.

Described from a single female specimen captured December 4, 1911 on the pane of a window in the mess of workmen's quarters on a sugar farm, near Nelson, Queensland. Later, on December 20, 1911 a second female was taken from a spider's web against a window in the same place. And a third female from a window in an empty dwelling at Thursday Island, Torres Strait, March 13, 1912.

Habitat : Australia—Queensland (Nelson, Cairns District and Thursday Island, Torres Strait.)

Type : No. Hy/802, Queensland Museum, Brisbane, one female in xylol-balsam (Nelson).

2. PARATRICHOGRAMMA FUSCA new species.

Female :—Length, 0.60 mm. ; normal in size for the genus.

The same as *cinderella* but differing structurally as follows : The venation of the fore wing is uniform and continuous and forms toward the end a gentle curve ; the fore wings are slightly fumated throughout and more densely ciliate (about eighteen lines of discal cilia) discally, the lines of cilia long and apparently there is no noticeable sootiness proximad ; the antennal club-joint is longer. Otherwise, same as the type species. The venation dilates a little at the apex of the marginal vein.

(From one specimen, the same magnification.)

Male :—Unknown.

Described from a single female specimen remounted in xylol-balsam from alcohol and captured from the window of a dwelling at Cooktown, N.Q., February 3, 1912.

Habitat : Australia—Cooktown, Queensland.

Type: No. Hy/803, Queensland Museum, Brisbane, 1 ♀ in xylol-balsam (mounted with the type female of *Polynema spenceri* Girault* and two trichogrammatids).

What I believe is the male of *cinderella* was captured on the window of a hotel at Cooktown on February 6, 1912, running over the pane with several specimens of *Trichogramma australicum* for which I mistook it. It agrees very well with *cinderella* but I shall not attempt to identify it with that species. The structural characters are nearly the same as with the female but the funicle joint has the peduncle shaped like an extension of one side, while the apex of the joint is scooped out somewhat; the peduncle is also longer and more conspicuous and the funicle itself longer.

GENUS TRICHOGRAMMATOIDEA Girault.

1. TRICHOGRAMMATOIDEA FLAVA new species.

Female:—Length, 0.33 mm. Minute, barely visible to the naked eye. Similar to *nana* but uniformly orange-yellow, the wings hyaline or nearly and more rounded at apex, flatly rounded in *nana*. It is much smaller than *lutea*, has the fore wings very lightly fumated out to the end of the venation and the discal ciliation sparse and inconspicuous.

(From a single female, the same magnification.)

Male:—Not known.

Described from a female captured as noted below.

Habitat: Australia—Rossville in the Cooktown District, N.Q.

Type: No. Hy/995, Queensland Museum, Brisbane, the one female mounted in xylol-balsam.

2. TRICHOGRAMMATOIDEA NANA (Zehntner).

A single female of this characteristic species was captured by myself from the panes of a window in a private residence at Kuranda, N.Q., November 4, 1911. Formerly it has been known from Java only. Being parasitic upon the eggs of sugarcane insects, its occurrence here is not strange. It is an introduced species most probably.

But subsequently, another female of the genus was captured in a store, February 23, 1912 in the little mining settlement of Rossville, N.Q., about thirty miles back through the forest from Cooktown. This specimen appeared to represent an unknown species and I have described it just above.

TABLE OF THE AUSTRALIAN GENERA OF THE TRICHOGRAMMATIDÆ.

FEMALES.

The genera marked with an asterisk are new and described in the preceding pages.

SUBFAMILY I. CHÆTOSTRICHINÆ.

Submarginal vein of fore wing reaching the costal margin at the point where it joins the marginal vein, the latter straight or nearly, the stigmal vein forming more or less of an acute angle with it. Venation of the fore wing straight.

* Described in Part II.

TRIBE I. CHÆTOSTRICHINI.

The funicle of the antennæ is present. The bulk of the Australian genera belong to this tribe. Ovipositor not exerted nor prominent, nor are its valves.

Antennæ 9-jointed.

Two ring-joints and a 2-jointed funicle.

Fore wings with the discal ciliation normal for the Chalcidoidea.

Fore wings moderate in width, the marginal cilia at apex short; abdomen conic-ovate; pedicel of antenna larger than funicle; stigmal vein nearly neckless

Brachistella Girault.

Fore wings with the discal ciliation arranged, more or less, in longitudinal lines.

Stigmal vein sessile or neckless; oblique line of discal cilia from stigmal vein may be present.

Fore wings nearly as in *Oligosita*; their discal ciliation sparse, their marginal cilia moderately long; joints of antennal funicle wider than long

Abbella Girault.

Antennæ 8-jointed.

One funicle joint; two ring-joints.

Fore wings broad, distad with long marginal cilia; club 3-jointed; ovipositor only half the length of the abdomen

Brachista Haliday.

Fore wings not very broad, distad with short marginal cilia; club 3-jointed; ovipositor inserted at base of abdomen and extending to tip

Neobrachista Girault *

Two funicle and ring joints. Marginal and submarginal veins nearly equal, short.

Antennæ with the funicle apparently twisted and indistinctly divided obliquely, much larger than the pedicel; male antennæ different; abdomen short, stout, obliquely truncate at apex. Fore wings short and rather broadly rounded at apex, the discal ciliation with some peculiarly distinct lines; marginal cilia of the fore wing very short; neck of stigmal vein not slender. Ovipositor short, inserted at the middle of the venter

Ufens Girault.

Antennæ with the funicle normal but shorter than the pedicel; male antennæ not different; abdomen longer than the thorax, conic-ovate, acute at apex; fore wings slenderer, without some of the lines of discal ciliation peculiarly distinct; marginal cilia moderately short; neck of stigmal vein slender. Ovipositor long, inserted at base of the venter

Japania Girault.

Antennæ 7-jointed with one ring-joint.

Funicle 1-jointed, the club 3-jointed. Discal cilia of fore wing sparse and more normal than otherwise. Marginal vein very long; ovipositor inserted at base of venter.

Fore wings with the longest marginal cilia subequal, more or less, to the greatest width of the blade, the wings slender; abdomen long; stigmal vein subsessile. Club slender

Oligosita Haliday.

Funicle 2-jointed, the club 2-jointed. Discal cilia of fore wing moderately dense and in lines; marginal vein very short and stout; ovipositor short, inserted toward tip of venter.

Fore wings with the marginal cilia very short; stigmal vein subobsolete; antennal club broad and conic

Brachygramma Girault. *

- Antennæ 6-jointed with one ring-joint, the funicle 2-jointed. Marginal vein short. Discal cilia of fore wing moderately sparse and in regular lines. Fore wings with the marginal cilia between a fourth and a fifth the greatest width; with the habitus of *Trichogrammatoidea* .. **Pseudogramma Girault.***
- Either the ovipositor or its valves is distinctly exerted for a length equal to a fifth or more of that of the abdomen.
- Antennæ 9-jointed with *three* ring-joints.
- Ovipositor inserted slightly proximad of the middle of the venter; funicle 1-jointed; marginal vein short, the discal ciliation of the fore wing dense and normal but with a few lines peculiarly distinct and regular; marginal cilia short; submarginal vein very long; with a habitus of *Neobrachista*. Very robust for the family .. **Neobrachistella Girault.***
- Antennæ 7-jointed with one ring-joint.
- Funicle of antenna 1-jointed, the club slender; marginal vein long; discal cilia of fore wing in regular lines, the marginal cilia moderate in length; ovipositor exerted for about a third of the length of the abdomen. With the habitus of *Lathromeroidea* .. **Centrobiella Girault.***
- Funicle of antenna 1-jointed, the club 3-jointed and swollen; stigmal vein distinct; discal cilia of fore wings rather dense, normal; marginal cilia moderate in length; ovipositor exerted for not more than a sixth the length of the abdomen. With the habitus of *Tumidiclava* **Neocentrobia Girault.***
- TRIBE 2. LATHROMERINI.
- The funicle of the antenna is absent. Four genera peculiar to Australia belong here together with three others more widely distributed.
- Antennal club more than 3-jointed.
- Antennal club 5-jointed.
- Antennæ 9-jointed with two ring-joints; marginal vein long and slender.
- Antennal club ending in a spinelike seta; ovipositor inserted at base of the abdomen, the latter as long as the head and thorax combined; no oblique line of discal cilia from the stigmal vein; marginal cilia of fore wing short, much less than a fourth the greatest wing width. Fore wings moderately broad. Body long **Lathromerella Girault.***
- Antennal club not terminating in a spinelike seta; ovipositor the same but the abdomen short and acute, the body short and compact; an oblique line of discal cilia leading back from the stigmal vein; marginal cilia of fore wing moderate in length, about a fourth or more the greatest wing width. Fore wings narrow **Lathromeroidea Girault.***
- Antennæ 8-jointed with one ring-joint; marginal vein short.
- Antennal club clothed with long, stiff, spinelike setæ and fusiform-acuminate in shape, the terminal joint long and acuminate, the proximal joints transverse; fore wings as in *Ufens* as is also the body **Haeckeliana Girault.***
- Antennal club 3-jointed.
- Antennæ 6-jointed with one ring-joint, the club normal, not swollen.
- Marginal vein of fore wing longer, subequal to the submarginal or nearly, about thrice the length of the stigmal vein; abdomen long and conic, the long ovipositor inserted at its base and slightly exerted beyond its tip; discal cilia of fore wing rather sparse but in regular lines **Pteryogramma Perkins.**

- Marginal vein of fore wing shorter, only about half the length of the submarginal and about twice the length of the stigmal; abdomen short, the ovipositor short, inserted near the middle of the venter or farther distad and not at all exerted; discal cilia of fore wings dense, less distinctly in regular lines **Uscana** Girault.
- Antennæ 7-jointed, the club 3-jointed and swollen; two ring-joints.
Marginal vein long but the stigmal a mere spur from the marginal, apparently absent; club terminating in a spinelike seta **Tumidiclava** Girault.
- Antennal club 2-jointed.
Antennæ 5-jointed, the club cylindrical; discal ciliation dense and normal, the marginal cilia short; marginal vein more or less swollen; stigmal vein very small **Aphelinoidea** Girault.

SUBFAMILY II. TRICHOGRAMMATINÆ.

Submarginal vein of fore wing not reaching the costal wing margin but joining directly with the incurved proximal end of the marginal vein, the latter curved, the distal end of the submarginal vein, the marginal and stigmal veins forming a regular sigma or arch whose apex is about at the middle of the marginal vein where the latter reaches the costa; or the veins forming a regular bow. Venation of the fore wing curved.

TRIBE 1. TRICHOGRAMMATINI.

- The venation of the fore wing forms a bow.
- Antennal club solid, comprising but a single joint; ovipositor not exerted; one ring-joint.
- Antennæ 6-jointed, the funicle 2-jointed.
Fore wings relatively broader, the discal and marginal ciliation short; funicle without minute, bladder-like appendages; male antennæ not distinctly segmented, apparently but 4-jointed, the distal joint long and nodular **Trichogramma** Westwood.
- Fore wings relatively narrower, the marginal ciliation distad moderately long; funicle with minute bladder-like appendages; male antennæ distinctly 8-jointed **Trichogrammatoidea** Girault.
- Antennæ 5-jointed, the funicle 1-jointed.
As in *Trichogrammatoidea* nearly; marginal cilia of fore wing short; venation a very flat bow; stigmal vein a mere footlike clava from the marginal vein **Paratrichogramma** Girault.*

TRIBE 2. POROPEINI.

The venation of the fore wing forms a sigmoid arch.
There are no Australian genera belonging to this tribe.

LITERATURE REFERRED TO.

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1910. Idem. Fauna Hawaiiensis, Cambridge, England, II., part VI.
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AUSTRALIAN HYMENOPTERA CHALCIDOIDEA—II

The Family Mymaridæ with Description of New Species.*

BY A. A. GIRAULT.

INTRODUCTION.

I PRESENT herewith the second part of the Australian Hymenoptera Chalcidoidea, dealing with that family of excessively minute insects, the MYMARIDÆ. No new genera have been found thus far in Australia. All the previously known forms have been captured excepting one or two, and thirty-six new species are described, together with several new varieties. The paper is restricted solely to the systematic results but it should be stated that most of the collections in the group were made along the east coast of Queensland only and it is very probable, therefore, that a rather large number of forms remain as yet unknown, especially from the western coast of Australia and from the interior. For the present, also, I reserve any discussion of the taxonomy of the group and follow the present arrangement of the subfamilies and tribes. It may turn out, as Perkins has thought, that the group represents a superfamily but certainly it will form a very small and decimated one.

Where duplicate specimens exist, they will be deposited in the United States National Museum, Washington, D.C., U.S.A., as co-types. All specimens were described after being mounted in xylol-balsam.

DEDICATION.

This small contribution and result of pleasant labor is dedicated to the genius of mankind, more especially to that form of it expressed in monistic philosophy whose conceived perception I think is the highest attainment reached by man. It embraces the kernel of bald truth as far as experience and reflection have detected it and sums up the known and unknown of countless generations of men and the countless efforts of thinkers of all ages, nationalities, peoples, civilisations and schools, religious or otherwise. I therefore respectfully dedicate

* Contribution No. 4, Entomological Laboratory, Sugar Experiment Stations, Mackay, Queensland.

each new species to monistic philosophers, whole or in part, not as a small memorial to each but rather as symbolising through each man's life, some of the highest milestones yet reached in the progressive development of the nervous system in man. This is a high dedication for so small a work. As a rule, one man or group of men form but poor symbols and in a sense are falsely set up as such, since it leads to hero-worship and idolatry to do so. But these men must be taken to represent the ideas behind them, for which they lived and worked. In this sense, they represent inquiring humanity, striving to penetrate the unknown, to disperse superstition and false religions and to attain to complete understanding of the relations of mankind to the universe, thus attaining human justice and unity, through a complete knowledge of his nature.

On the other hand, the gregarious nature of man has so debased his independence of character that it is undoubtedly true that only the exceptional individual differentiates himself from the fold and becomes the inquiring part of humanity. From this point of view, these men are leaders and what we designate as great. That is no reason for worshipping them, however. They illustrate what humanity is capable of and that it is not necessary in order to live aright to subordinate one's mind to stultifying, more or less degrading and certainly misleading dogmatisms, nor to conventionalities, nor to every whim of fashion or authority. These men, too, represent some of the highest points yet reached in the building which humanity is slowly constructing while the foundations and framework are composed of the common, ordinary individuals of many kinds and degrees of goodness, badness and indifference, but nevertheless essentially a part of the whole building and the source of all its perfections.

HYMENOPTERA CHALCIDOIDEA.

FAMILY MYMARIDÆ Haliday.

SUBFAMILY GONATOCERINÆ Howard.

TRIBE OOCTONINI.

GENUS OOCTONUS Haliday.

1. OOCTONUS AUSTRALIENSIS Perkins.

Perkins, 1905, pp. 191, 193, 194, 195, pl. XIII, fig. 2 (lowest two figs.).

Idem, 1906, p. xxiv.

“*Hab.*: Cairns, Queensland; two examples extracted from eggs of a conspicuous *Tettigonia* common in the canefields” (Perkins, 1905); in the second citation, Perkins records the host as “Eggs of *Tettigonia* (*albida* or *parthaon*).”

I have not seen this species as yet nor any others from Australia.

TRIBE GONATOCERINI.

GENUS LEIMACIS Foerster.

1. **LEIMACIS LOMONOSOFFI** new species.

Female:—Length, 0.70 mm.; moderately small for the family.

General color bright lemon-yellow, the tip of the ovipositor sheaths and pronotum dusky black; eyes and ocelli bright red; antennal flagellum, venation, cephalic margin of the fore wing (somewhat) and distal tarsal joints dusky black; remaining joints of all legs, antennal scape and pedicel concolorous with body. Wings hyaline but slightly suffused with dusky, especially proximad.

With the habitus of an *Anagrus* but the antennæ but 8-jointed and tarsi 5-jointed. Fore wings moderate, resembling somewhat those of an *Oligosita*, moderately narrow and gradually widening out as far as the apex of the proximal two thirds, then more rapidly widening especially because the cephalic margin becomes convex; discal ciliation not regular, grouped irregularly, moderately sparse and fine, about seven to eight longitudinal lines across the widest portion of the wing, including a line across the margins, arranged in a curved group of three lines in the disto-cephalic half of the blade, the lines reaching the apex and there joining another group of three lines in the disto-caudal half of the blade which are straighter and the cephalic line of which is short (at the most including four cilia) and over the centre of the others; thus but two of these lines reach the apex; proximad, each group of lines straggles out to one and the cilia become smaller; other discal ciliation absent, hence there are large naked spaces in the blade. Marginal cilia of fore wing moderately long and subequal along both margins, the longest cilia about three fourths the wing's greatest width. Caudal dilatation of fore wing (along caudal margin) small, just indicated. Marginal and submarginal veins long and subequal, the former about ten times longer than its average width, obelavate, terminating along the costal edge, hence the "stigmatal" vein (or downward prolongation of the marginal vein) is absent. The marginal vein is hard to differentiate from the costal wing margin; it bears a large seta at its apex and two others of nearly equal size at its base and middle respectively (besides about half a dozen small setæ). Posterior wings very narrow, acuminate, its venation at apex bearing four hooklets; discal ciliation consisting of a single line along the cephalic margin and a paired line along the caudal margin, absent elsewhere; marginal cilia moderate, the longest (caudad) about thrice the width of the blade, those of the cephalic margin more than a half shorter.

Abdomen sessile, conic-ovate, slightly longer than the thorax, its segments unequal, the sheaths of the ovipositor distinctly exerted but only for a short length (about a fifth of the abdomen's length). Base of abdomen rounded, subsessile in appearance, not broadly, truncately attached. Tibial spurs single,

short, the cephalic one forming a normal strigil; tarsal joints moderate in length, shortening distad. Ovipositor running nearly the whole abdomen's length. Mesophragma absent.

Antennæ 8-jointed, resembling those of *Anagrus*. Scape with its bulb long, thrice the length of the usual pedicel, the latter four or five times the size of the small proximal funicle joint, which, however, is longer than wide; remaining portion of antenna somewhat like that of *Anagrus armatus* (Ashmead), the joints gradually widening distad; joints 2 and 3 subequal in length but 3 is stouter; 4 still stouter, cylindrical, subequal in length to 3 or about a fourth shorter; 5 a fourth shorter than 4 and stouter, yet still cylindrical and about twice longer than wide. Club ovate and stouter, about equal to the combined length of the two joints preceding, bearing several obliquely longitudinal sulci, which give the appearance of lamellate segmentation as in the club of *Stethynium*. Pubescence of antenna apparently absent but sparse and thin.

(From one specimen, 1/6-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen found dead, adhering to the under surface of a leaf of a shrub among a scattered mass of minute, elliptical white eggs apparently those of a mite; the shrub was growing along the east edge of the Mulgrave River about a mile south of Nelson, N.Q.

The specimen was taken on November 28, 1911.

Habitat: Australia—Queensland (Nelson, Cairns District).

Type: No. *Hy*/1068, Queensland Museum, Brisbane, one female in xylol-balsam.

Respectfully dedicated to the Russian peasant, Michael Wassiliewitsch Lomonosoff, afterward physical chemist, professor and man of affairs, one of the fathers of modern chemistry and profound research scholar.

GENUS ALAPTUS Haliday.

All in normal position.

1. ALAPTUS IMMATURUS Perkins.

Perkins, 1905, pp. 188, 191, 193, 194, 197, pl. XII, fig. 5; 1906, p. xxiv; 1910, p. 661.

This species was briefly described by Perkins (1905) from specimens reared from sugarcane leaves at Bundaberg, Queensland. I have captured what appears to be a female specimen at Babinda, Queensland, October 29, 1911. This specimen was found crawling over the under surface of a leaf of imported

citron growing wild near the jungle and which was infested with leafhoppers (jassids and fulgorids) and doubtless psocids. The description of *immaturus* omits all details of the wings but the specimen before me agrees in general with the figure of the antenna published with the description and also is pallid lemon-yellow in colour, with the two basal antennal joints concolorous, the flagellum darker. I believe, therefore, that *immaturus* is the species in question, though it is possible that this is not so, the wings being different. I add the following descriptive details and compare the species with some American forms, specimens of which I have before me: The fore wings are normal and margined with brownish; their marginal cilia are very long, longest caudo-distad, there about thrice the greatest wing width; as usual they are pallid a short distance out from the wing edge, forming the usual halo-like clear path around the margin of the wing at apex; the discal ciliation is absent with the exception of a single line along the caudal margin and a double line along the cephalic margin; proximad, some distance out from the venation, is a single central isolated cilium and another at about the base of the distal third of the wing; near this, just caudo-distad is a line of five cilia, near the inner of the two lines along the cephalic margin; this short line does not reach the wing apex by over a third of its own length; all of these cilia in reality form the long inner line of cilia near the cephalic margin. The fore wings are hyaline, but clouded somewhat near base. The caudal dilatation along the caudal margin opposite the venation is very acute and resembles the fin of a fish; its pointed, sharp apex forms distad a concave curve with the caudal margin of the wing. Marginal vein of fore wing long, about six or more times longer than wide but shorter than the submarginal vein. Caudal wings are slender clavate, gradually widening distad, obtusely pointed at apex and bearing but a single line of discal ciliation, which does not reach the apex and which is not quite central. Its marginal cilia are not quite as long as those of the fore wing; the blade is dusky and obscurely maculated.

Tarsal joints shortening distad, the proximal joint much the longest, moderately long. Antennal pubescence normal.

This Australian species differs from the American *cacilii* Girault very much; the latter has a longer scape and pedicel and the second funicle joint is longer in its relation to the first; the fore wings in *cacilii* are narrower and their discal ciliation (the line of five cilia) is much farther caudad and more central; the posterior wings are more clavate, hence broader. The general body color is more intense than with *immaturus* whose color is more or less inconspicuous and obscure. From the American *iceryæ* Riley, it differs not so much in color but the scape is shorter in *immaturus* and the funicle joints longer; the first and second funicle joints in the Australian species, for example, are twice the length respectively of the corresponding segments in *iceryæ*. Again, the fore wings of the latter are narrower, bear less midlongitudinal discal

cilia (only one or two cilia in the midlongitudinal line); the caudal wings are about the same in each species. The species cannot be confused with either the English *minimus* Walker or the American *intonsipennis* Girault which have the long proximal funicle joints of the antennæ and the different midlongitudinal discal ciliation of the fore wings—none in *minimus** and in *intonsipennis* the single long line; nor with the species *globosicornis* Girault which has the characteristic submoniliform antennal funicle.

These notes were taken from the specimen above mentioned, mounted in xylol-balsam, 1/6-inch objective, 1-inch optic, Bausch and Lomb. Subsequently a female at Herberton, N.Q., December 28, 1912 and one at Nelson, April 10, 1912, both on windows.

Habitat: Australia—Bundaberg, Herberton and the Cairns District, N.Q. Sandwich Islands—Oahu (Perkins, 1910, p. 661).

2. ALAPTUS MÜLLERI new species.

Female:—Length, 0.28 mm.; about normal in size for the genus.

General color deep brown, the abdomen somewhat darker. Eyes and ocelli dark reddish; antennæ and legs concolorous with the body but the scape of the former and the femora and tibiæ of the latter are somewhat darker. Fore wings hyaline, except at base. Posterior wings dusky and maculate. Fore wings margined usually with brownish.

Unlike in antennal and wing structure any species of the genus but more nearly allied with *minimus* Walker than to any other species. Differing from *minimus* principally in bearing more discal ciliation on the fore wing—besides the two rows along the cephalic wing margin and one row along the caudal edge there are four cilia in the midlongitudinal line of the wing from near the apex and a line of three cilia farther proximad, running distad from the distal half of the blade and not in a straight line; these two lines are not very far apart from each other (proximo-distad), only about twice the distance between any two cilia in either of the lines. If joined, they would form one continuous line, reaching nearly from the apex to the middle of the wing.

The species *minimus* bears no true midlongitudinal discal ciliation on the fore wing. The antennæ are nearly similar to those of *minimus* but the pedicel is distinctly longer than the first funicle joint; the second joint as in *minimus* is much the longest of the funicle, comparatively long and slender. From the American *intonsipennis*, *mülleri* differs in general body color being brown

* In regard to the genus *Alaptus*, it must be held in mind that the fore wings of all species so far seen by me bear two distinct rows of discal cilia along the cephalic edge and one along the caudal. Thus *intonsipennis* differs from *minimus* really in bearing an additional line of discal ciliation. This detail has been confused by me in my former treatment of this genus.

instead of black and in bearing the longer antennal pedicel; besides its midlongitudinal line of discal cilia of the fore wing is nearer the cephalic margin, is longer and continuous. From the American species *globosicornis*, this species may be distinguished readily by the marked differences in antennal structure; moreover, it has more discal ciliation and both of its wings are somewhat broader but the two species agree nearly in general coloration yet *mülleri* is darker brown. From the species *iceryæ* Riley, *cæciliæ* Girault and *eriococci* Girault it differs again in bearing more abundant discal ciliation—*iceryæ* only one or two cilia, *cæciliæ* only a row of from three to six cilia, the row central and distant from the wing apex and *eriococci* three or four cilia, similarly situated; *cæciliæ* is distinctly different in general coloration, bears narrower fore wings and the third funicle joint is longer in relation to the fifth; *iceryæ* is more olivaceous, less intensely brown than *mülleri*, its proximal two funicle joints are much shorter and its wings narrower; *eriococci* is more closely allied but its proximal funicle joint is shorter, especially in its relation to funicle joint 5, which is distinctly longer than it. If anything, funicle joint 5 in *mülleri* is slightly shorter than funicle joint 1. From *immaturus* Perkins, *mülleri* differs in its darker coloration, in the arrangement of the discal ciliation of the fore wing and as follows: the second joint of the antennal funicle in *mülleri* is distinctly longer, also the pedicel; the venation of the fore wing is distinctly shorter and the antennal scape is longer and more slender.

(From one specimen, 1/6-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen mounted in xylol-balsam and received for identification from Dr. L. O. Howard, Chief of the Bureau of Entomology, U.S. Department of Agriculture, Washington, D.C., U.S.A., and bearing the label "871. Swan River, W. Austr. G. Compere." Dedicated to Johannes Müller, the great student of comparative physiology.

Habitat: Australia—West Australia (Swan River).

Type: No. *Hy/1052*, Queensland Museum, Brisbane, Q., one female in balsam. (In the centre of the slide.)

3. *ALAPTUS GLOBOSICORNIS* Girault.

A single female of what I think cannot be otherwise than this species was captured while writing at a table in an hotel at Nelson, N.Q., December 5, 1911. The specimen was barely visible as it walked along over the surface of some paper and was noticed by accident only. It is greyish in general coloration, with the narrow scutellum light orange, thus differing from a specimen of the species from Honolulu, Hawaii, which is deep brown. Also, the fore wing bears

but a single discal cilium. Nevertheless, I cannot distinguish them structurally. In the original description of *globosicornis*, the second funicle joint is figured quite too large in relation to joint 1; in both of the specimens now before me (the one recorded from Hawaii, the other captured in Queensland) joints 1 and 2 of the funicle are subequal and wider than long; joint 3 is decidedly longer than either 1 or 2 and globular-ovate, longer than wide and the remaining joints enlarge in proportion. If this is not true with the types of *globosicornis*, the antennæ of that species being as figured, then there must be at least two species concerned here, if not three, since differences in coloration would then amount (perhaps) to a specific character. Girault (1911a) makes a remark, however, about the proximal funicle joint as figured in the original description of *globosicornis* which leads to the same inference as that above—namely, that the original figure is wrong in respect to the first two joints of the antennal funicle.

Later on I captured another female and two males from the panes of a window. The two males were taken from the windows of a barn on a wheat farm at Roma, Queensland, October 6, 1911; while the female was taken from a window in workmen's quarters on a sugar farm at Nelson, N.Q., December 18, 1911. These all agreed in general coloration and structure of the wings. The male antennæ heretofore unknown are now described: Filiform, 10-jointed; funicle joints all longer than wide, the first shortest, a fourth or more shorter than the second; joints 2-7 subequal in length but 2 and 3 equal and each slightly shorter than joints 4-7 taken separately; distal joint conical but subequal in length to joint 7 of the funicle.

In the two male specimens the single central discal cilium was missing from the fore wings; one of them had also become nearly black since its immersion in xylol-balsam.

Later on at the same place that the last female was captured I obtained two more females on December 19, 1911 (plus one female of the new species described below) and another on the following day. One of these females had both of the midlongitudinal discal cilia present; all were colored like the others captured in Queensland. Also from windows at Nelson, two females, January 23, 1912; three females two days later and three on January 26, 1912.

The two following geographical varieties:—

1. *Alaptus globosicornis hawaiiensis* new variety, deep reddish brown. (See Girault, 1911a, p. 132.)

2. *Alaptus globosicornis australiensis* new variety, greyish, the scutellum light orange.

Type of hawaiiensis: No. Hy/1053, Queensland Museum, Brisbane, 1 ♀ in xylol-balsam (Honolulu, August 3, 1900).

Type of australiensis: No. Hy/1054, Queensland Museum, Brisbane, 3 ♀'s in xylol-balsam, 1 slide (Nelson, N.Q., January 26, 1912).

4. ALAPTUS NEWTONI new species.

Female:—Length, 0.25 mm.; a mere speck; usual in size for the genus.

General color greyish, dusky or ashy* like the specimens of *globosicornis* noted in foregoing; all of the legs pallid, including the coxæ; the scape and pedicel also dusky, the remaining part of the antenna concolorous with the dusky, ashy grey of the body. Fore wing very lightly uniformly fumated throughout, the posterior wings distinctly splotched with dusky.

Exactly similar to the above specimens of *globosicornis* in all particulars excepting these: the proximal tarsal joints of the legs are shorter and the proximal funicle joints of the antennæ are longer and unequal, not about equal and longer than wide but each distinctly longer than wide, cylindrical, the second joint over a fourth longer than the first and distinctly about twice longer than its width, which is uniform. Also the funicle joints are not globular but from the third, cylindrical ovate. There are two discal cilia in the midlongitudinal line of the fore wing, isolated and situated as with *globosicornis*.

From *mülleri* this species differs in general coloration, its fore wings are narrower and with less midlongitudinal discal ciliation and in its antenna the distal funicle joint is barely shorter than the second though wider; but in *mülleri* the distal funicle joint is distinctly shorter than funicle joint 2; the latter joint is longer in *mülleri*. From the remaining Australian species, *immaturus*, this species differs in bearing narrower fore wings with less midlongitudinal discal cilia; the details of coloration also differ. In antennal structure it somewhat resembles *cacilii* of North America but upon comparison the two species are seen to have distinct habiti and furthermore *cacilii* is of a distinct bright yellow in color,† its antennal club is longer and in the antennal funicle the second funicle joint is distinctly longer than the distal joint and longer relatively to joint 1 than is the case with *newtoni*; also in *cacilii* the proximal joints of the tarsi are distinctly longer than those of *newtoni*. From *iceryæ* Riley, *newtoni* differs not so much, in fact resembling it closely; but in *iceryæ* the proximal funicle joints are shorter, thus funicle 1 is subquadrate, barely longer than wide and funicle 2 is only one and a-half times its own width, if that much hence in *iceryæ* funicle 3 is longest of the three proximal funicle joints; in *newtoni* funicle joint 2 slightly the longest. From *eriococci* Girault, another species described from North America, *newtoni* differs not very much but the legs are paler, the fore wings bear but two discal cilia (in *eriococci*

* Some of the specimens later were bright lemon-yellow.

† See previous footnote.

there are four, the statement made by Girault, 1908, p. 193, in the table of species of *Alaptus* being erroneous, the statement in the original description of *eriococci* being correct); also the general body coloration appears to be different, lighter in *newtoni*.

(From one specimen, the same magnification.)

Male:—Unknown.

Described at first from a single female specimen mounted in balsam and captured from the panes of a window in men's quarters on a sugar farm near Nelson, N.Q., December 19, 1911. Later four females were obtained from a window in an empty dwelling on Thursday Island, March 13 and 14, 1912. One of these bore five cilia in the midlongitudinal line of the fore wing, from the middle, each end of the line about equidistant from apex and caudal excision respectively.

Habitat: Queensland (Nelson, Cairns District; Thursday Island, Torres Strait).

Type: No. Hy/1055, Queensland Museum, Brisbane, one female in xylol-balsam (mounted with two females of *A. globosicornis* Girault as above identified and the type female of *Anaphoidea harveyi* Girault*).

Although resembling closely *cæcili* and *eriococci*, I think this species is quite distinct. It is respectfully dedicated to Sir Isaac Newton, who discovered gravitation.

DIAGNOSTIC ARRANGEMENT OF THE AUSTRALIAN SPECIES OF *ALAPTUS*_s
HALIDAY.

FEMALES.

Funicle joints of antennæ all short, wider than long or subglobose. Fore wings with but one or two midlongitudinal discal cilia.

First two funicle joints subequal, wider than long, small.

Deep reddish brown *globosicornis hawaiiensis* Girault.

Greyish, ashy, the scutellum light orange *globosicornis australiensis* Girault.

Funicle joints of antenna not all short, wider than long or subglobose but at least the proximal joints cylindrical, more or less elongate and longer than wide, the distal joints usually cylindrical ovate. Fore wings usually with more than two midlongitudinal discal cilia.

Fore wing without discal cilia in the midlongitudinal line but of the two cephalic lines of discal cilia the inner stands out some distance from the wing margin forming a long line of cilia from apex nearly to venation. Second funicle joint longest, four times longer than wide.

Pale lemon-yellow, the two proximal joints of antenna concolorous *immaturus* Perkins.

* Described on a later page.

Fore wing with discal cilia in the midlongitudinal line.

The midlongitudinal discal cilia slightly cephalad consisting of about seven cilia in one line, the cilia far apart, the line in the distal half of the blade; second funicle joint longest, the first shorter than the third; second funicle joint four times longer than wide.

Deep brown *mülleri* Girault.

The midlongitudinal discal ciliation consisting of not more than five (usually less) cilia in a short line which is about midway between apex of the wing and the venation; second funicle joint longest but only twice longer than wide, subequal in length to the pedicel.

Greyish dusky to lemon-yellow *newtoni* Girault.

GENUS LITUS Haliday.

1. **LITUS SCHLEIDENI** new species.

Female:—Length, 0.33 mm.; moderate in size for the genus; very minute.

Differing at once from the two known species of the genus in coloration; general color greyish black, the thorax and basal part of abdomen except a transverse band at the middle, lighter, greyish, the transverse band (the scutellum) still paler, pale yellow. All of legs and scape, pedicel and first funicle joint of the antennæ pallid the remaining portions of the antenna greyish black. Both wings fumated throughout with greyish.

Differing structurally from *cynipseus* Haliday (see Girault, 1911b, pp. 363-364) as follows: The proximal funicle joint, though much shorter than funicle joint 2, yet is distinctly longer than wide and slender; the fore wings are curved; the posterior wings are not maculated. From *enocki* Howard, it differs structurally in having the two proximal funicle joints unequal, joint 1 only about two thirds the length of joint 2.

Fore wings slender, nearly as in *Alaptus*, the dilatation along the caudal margin opposite the marginal vein conspicuous, the wing being slightly the widest across it; discal ciliation of the fore wing not dense but distinct, consisting of about five lines, a pair along each margin and a short line in the middle of the blade (midway between apex of venation and apex of the blade), sometimes extending quite to the apex but leaving a variable, more or less distinct naked area in the blade just back from the apex; discal ciliation disappearing proximad out from the apex of the marginal vein a distance over the latter's length (in other words, the proximal half of the blade is naked). Marginal cilia long as in *Alaptus*, the longest fully three and a half times the greatest width of the wing; the usual clear path around the wing margin distad; the fore wing is bent at its proximal three fourths. Marginal vein moderate in

length, five times longer than wide. Posterior wings slender and straight, slightly narrower than the narrow part of the fore wing (just distad of the dilatation), bearing a single line of discal ciliation along the cephalic margin and another, more conspicuous long line from the apex and slightly cephalad of the midlongitudinal line of the blade. Longest marginal cilia of caudal wing somewhat shorter than the corresponding cilia of the fore wing.

Abdomen short, sessile, ovate, the valves of the ovipositor slightly exerted; mesophragma present; the five tarsal joints short. Antennæ 9-jointed; pedicel globular, much wider than the first funicle joint; proximal two funicle joints cylindrical, the others gradually enlarging; funicle joint 2 longest, joint 3 only slightly longer than joint 1 and slightly thickening distad; joints 4, 5 and 6 each subequal to joint 3 in length but cylindrical oval, 6 somewhat the widest; club of antenna long-ovate, equal to or somewhat longer than the preceding three joints. Funicle joint 5 sometimes slightly shorter than 4 and 6. Club of antenna no wider than the funicle distad. Pubescence of antenna consisting of whorls of soft, short setæ, much as in *Alaptus* Haliday.

(From two specimens, the same magnification as with species of previous genera.)

Male:—Unknown.

Described from two female specimens captured while running over the panes of a window in an empty dwelling at Herberton, N.Q., December 28, 1911. Much smaller than *Alaptus immaturus* Perkins. Dedicated to Matthias Schleiden who discovered the living cell.

Habitat: Queensland (Herberton).

Type: No. *Hy/1051*, Queensland Museum, Brisbane, one female in xylol-balsam (mounted with a female of *Alaptus immaturus* Perkins).

GENUS DICOPUS Enoch.

1. DICOPUS PSYCHE Girault.

Girault, 1912, pp. 22-23.

This species, recently described from Suva, Fiji, from a single male specimen, is represented I think by a single female captured from the panes of a window in a private residence late in the afternoon of June 10, 1912 at Nelson, N.Q. The body coloration is much darker than described for the male, being sooty or greyish black, but the antenna and legs are greyish and the fore wings fumated as described for *psyche*; it agrees with the description of the latter excepting as noted. The posterior wings are petiolate out to the base of the distal third, there broadened into a blade. The specimen resembles the type

of the genus as figured by Enoch with the exception of antennal structure and discal ciliation. Thus, from the English species it differs in not having the scape angular along its dorsal margin and much longer in proportion to the pedicel (thrice or more longer), the funicle joints are more uneven, the second, third and fourth joints being elongate, subequal, each about twice the length of the first which is subequal in length to the pedicel or slightly shorter and about twice longer than wide; the two distal funicle joints are subequal, cylindrical ovate, joint 7 being intermediate in length between them and the three joints preceding it; either of the distal two funicle joints is longer than the proximal joint of the funicle. The club is slender, conic-ovate and acutely pointed, not much longer, however, than the combined length of the three preceding joints. The antennæ are thus much more slender than with the type species and resemble those of *camptoptera* Foerster. It is extremely gratifying to be able to connect this female specimen with the Fijian *psyche*, since it leaves little or no doubt that the male of the genus has been correctly described. The antennal club and scape of this female are subequal in length. Parapsidal furrows complete.

Habitat: Fijian Islands (Suva); Australia—Nelson, near Cairns, Queensland.

GENUS GONATOCERUS Nees.

All in normal position.

1. GONATOCERUS BACONI new species.

Male:—Length, 0.90 mm.; moderate in size for the genus.

General color golden yellow, the distal tarsal joints, antennal flagellum, distal half of the abdomen and distal portions of the thorax (more obscurely), black. Scape, pedicel, middles of femora, most of all tibiæ, venation and portions of the head dusky yellowish. Wings hyaline or sometimes with a brownish appearance.

Fore wings slender and graceful, the blade paddle-shaped, narrowing like a handle just distad of the venation, the blade bearing about fifteen longitudinal lines of discal cilia, the latter dense and moderately fine; marginal cilia of fore wing rather long for the genus but really for the family, only moderate in length, the longest (disto-caudad) slightly less than half the wing's greatest width, the cilia gradually lengthening from the cephalic margin around the apex. The longest marginal cilia of the fore wing are about equal to the longest cilia of the posterior wing (caudal margin). Posterior wing very narrow, pointed, not at all widened across the venation, its cephalic marginal cilia very short, those of the caudal margin about two and a half times the blade's width at its middle. Caudal wings with a double line of discal ciliation along each margin; the lines are complete.

Two tines of cephalic tibial spur unequal; strigil well developed; tarsal joints nearly all equal, moderately short, the proximal joints, however, nearly twice the length of any of the other four, moderately long.

Antennæ 13-jointed, filiform, flagellar joints longitudinally striate, short, the first somewhat shorter than the others which are cylindrical oval and slightly over twice longer than wide; distal joint slenderer; pedicel obconic, distinctly shorter than the first funicle joint; scape short but longer than any other joint. Pubescence of antennæ short, moderate, inconspicuous.

(From two specimens, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Female:—Unknown.

Described from the two male specimens captured together while sweeping low vegetation on sand, west bank of the Pioneer River, Mackay, Queensland, October 15, 1911 (A.A.G.). Dedicated to the Roman Catholic friar, Roger Bacon, who, in an early superstitious and ignorant century, long since laid down the basis for science and reason. He was centuries ahead of his time.

Habitat: Australia—Queensland (Mackay).

Type: No. *Hj/1036*, Queensland Museum, Brisbane, Queensland, the above two males in xylol-balsam, one slide.

This species resembles somewhat the North American *Gonatocerus aureus* Girault but differs from it in detail—for instance, the fore wings are more gracefully narrowed just distad of the venation, hence differently shaped.

2. GONATOCERUS DARWINI new species.

Female:—Length, 0.50 mm.; moderately small for the genus.

General color brown, the base of the abdomen golden yellow, the legs, antennæ and venation concolorous with the body, excepting the knees and trochanters which are paler. Wings hyaline.

Differs from the foregoing species in bearing much broader fore wings, shorter marginal cilia and darker general color. Of the American species falling in the group containing *anthonomi*, *americanus*, *texanus*, *brunneus*, *aureus* and *pygmaeus* and may be separated from the first as follows: The marginal cilia of the fore wing at apex are longer in *darwinii*, at least a fourth longer and the cilia caudad are also longer in proportion than those at the same place in the American species; the four proximal funicle joints in *darwinii* are all decidedly smaller and the sixth joint is also shorter and more rounded. Moreover, the base of the abdomen is yellow in *darwinii* and the pale streaks on the mesoscutum absent. Not very likely to be confused with the other American species of the same group, which differ either in general coloration or else in some structural

character. The fore wings bear about twenty-five lines of discal ciliation across their widest portion; the caudal wings bear a paired line along each margin and a similar but shorter line down the midlongitudinal line of the wing from the apex.

Antennæ 11-jointed, normal; proximal four funicle joints uneven, each much smaller than the pedicel; joint 4 shortest of them, wider than long; funicle joint 5 abruptly larger, subequal to the pedicel, more than twice the size of joint 4; 6 narrower and a third shorter than 5; 7 subequal to 5 while joint 8 is slightly shorter than it; joint 6 smaller than the joint preceding and the joints following. Scape broad, moderate in length. Funicle joints 5, 7 and 8 subequal, joint 6 intermediate between them and the four small proximal funicle joints.

(From two specimens, the same magnification.)

Male:—Unknown.

Described from two female specimens captured October 15 and 19, 1911 while sweeping along the left bank of the Pioneer River, Mackay, Queensland; low vegetation on sand. Dedicated respectfully to Charles Darwin.

Habitat: Queensland, Mackay.

Type: No. Hy/1037, Queensland Museum, Brisbane, one female on a slide.

3. GONATOCERUS HAECKELI new species.

Female:—Length, 0.65 mm.; moderately small for the genus.

General color uniform black suffused with dark brownish; legs dusky yellowish, the caudal tibiæ brown, the trochanters, knees and tips of tibiae yellowish, the distal tarsal joint dusky. Wings hyaline except faint cloudiness under the submarginal vein in the fore wing. Venation brown. Fore wing not margined with yellowish. Antennæ concolorous with the body.

Differs from *darwini* in bearing a naked space in the discal ciliation of the fore wing under (caudad) the marginal vein and in having the valves of the ovipositor distinctly but shortly exerted but less than with *rivalis* Girault and *ater* Foerster, as well as in other characters. Because of its subexserted ovipositor (valves) this species falls in the group of species containing *maga* Girault, *rivalis* Girault and *ater* Foerster and may be separated from the former by its broader fore wings which are not slender and graceful but bear about twenty-two longitudinal lines of discal cilia and are similar, or nearly, to those of *anthonomi*; also in *haeckeli* funicle joint 3 is much smaller, not subequal to joint 5 of the funicle; the fore wings are hyaline excepting as pointed out above; the antennæ of *haeckeli* are not slender as with *maga* and *rivalis*. From the latter, this species differs markedly in coloration, no yellow being present and also in having the joints 2 and 3 of the antennal funicle short. From the European *ater* Foerster, *haeckeli* differs markedly in the size of the wings and less noticeably in many other characteristics.

Abdomen conic-ovate, slender; fore wings nearly as in *darwini* but they are somewhat broader, the marginal cilia slightly shorter and caudad of the marginal vein no discal cilia are present excepting a line along the caudal edge of the submarginal vein arising from the wing membrane and a shorter, oblique line of about five cilia running caudo-distad from proximal end of the marginal vein; this clear area projects into the discal ciliation in the form somewhat of a wedge.

Antenna 11-jointed, usual; first four funicle joints short and subequal, each distinctly shorter than the pedicel and subquadrate or not much longer than wide; distal four joints of the funicle larger, subequal to or slightly larger than the pedicel, distinctly longer than wide, broader, joints 5 and 7 subequal, a fourth longer than joints 6 and 8 which are also subequal to each other.

(From a single specimen, the same magnification.)

Male:—The same but there is more yellow on the body, the base of the abdomen in the dorsal aspect is yellow, the flagellum paler, its joints short and subequal, each only about one and a-half times longer than broad but all longer than the pedicel.

(From one specimen, the same magnification.)

Described at first from a single female specimen captured from the panes of a window in a grocery store, Port Douglas, N.Q., October 30, 1911. Respectfully dedicated to Ernst Haeckel. Subsequently a female was taken by sweeping along the top of the coast range at Double Island (Cairns), N.Q., elevation about 450 feet, December 24, 1911. The fifth funicle joint was proportionately smaller, the femora and intermediate tibiae less dusky, lemon-yellow.

Habitat: Queensland (Port Douglas and Mossman; Double Island and Aloomba near Cairns).

Types: No. *Hy/1038*, Queensland Museum, Brisbane, one male, one female in xylol-balsam. (Port Douglas, female; male, Double Island.)

On a small island called Double Island about three miles off the coast from a bathing resort just north of Cairns, I captured a male by sweeping, Christmas Day, 1911. This specimen had scattered ciliation under the venation which was not conspicuous. Also a male at Mossman, N.Q., on a window, 31 October, 1911, and a pair at Aloomba, N.Q., by sweeping grass in a forest, July 7.

4. GONATOCERUS METCHNIKOFFI new species.

Female:—Length, 1.05 mm.; rather large for the genus.

General color deep, rich brown, the base of the abdomen narrowly, pale yellowish; scape and to a less extent the pedicel, greenish yellow, the other portions of the antennae nearly concolorous but with a suffusion of olivaceous; coxae, femora and distal halves of tibiae blackish or deep brown, dark, the trochanters, knees, proximal halves of the tibiae (all of cephalic tibiae) lighter brown.

suffused with pink,* contrasting; fourth tarsal joint paler, the distal joint dusky. Venation olivaceous. Wings hyaline, the fore wings not margined with dusky.

Differing from *baconi* in general coloration and much broader fore wings; from *darwini* also in being much darker, more specifically in bearing coarser discal ciliation in the fore wing, which does not extend to the apex of the venation, in bearing a somewhat longer marginal vein, longer marginal cilia at the cephalic margin of both wings and in having no midlongitudinal discal ciliation in the posterior wing (conspicuous distad in *darwini*); also in the antennæ of this species the proximal funicle joint is distinctly longer than that of *darwini*, the four distal funicle joints are larger and between the fifth and sixth joints there is not so much difference in size, these four joints in fact nearly subequal in *metchnikoffi*, not so in *darwini*, joint 6 being distinctly smallest of the four. From *haeckeli* this species differs in having the legs darker, the fore wings with much coarser discal cilia, the valves of the ovipositor not exerted and the marginal cilia along the cephalic margin of the fore wing longer.

Fore wings moderately broad, their discal ciliation moderately coarse, arranged only in about fifteen longitudinal lines across the widest blade portion, their marginal ciliation shortest disto-cephalad; proximal tarsal joint much the longest of the five; caudal wings bearing a paired line only of discal ciliation along each margin, narrow, not broadened across apex of their venation, their marginal cilia caudad longer than the longest marginal cilia of the fore wing. Tibial spurs single. Ovipositor not exerted.

Antennæ normal; pedicel longer than any of the first four funicle joints; the latter all short, opposed in this respect to the four distal joints, all of which are over twice the size of any of them. Proximal funicle joint longest of the first four, then joints 2, 3, and 4 gradually increase in size, joints 2 and 3 globose-ovate; joints 5-8 subequal or else very slightly decreasing in length, cylindrical ovate twice longer than broad and each distinctly longer than the pedicel; club shorter than the scape.

(From one specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen captured from the under surface of a leaf of *Ficus* species growing along the east bank of the Mulgrave River near Nelson, N.Q., during the afternoon of December 18, 1911. A species characterised by the grouping of the eight funicle joints of the antennæ into two groups of four subequal joints each, by its dark-brown color with the contrasting shadings on the legs, by the coarse discal ciliation of the fore wing and by the lack of midlongitudinal discal ciliation in the posterior wing. As

* After being mounted in xylol-balsam, the latter was stained pinkish from the body of this species as often noticed in the case of *Anagrus armatus* (Ashmead).

compared with the American species *anthonomi* Girault, this Australian species differs again in having the coarser discal ciliation of the fore wing and in having the distal funicle joints of the antennæ longer; there are also other minor differences, the most important of which are the lack of mid-longitudinal discal ciliation in the caudal wings and the shorter ciliated region of the disk of the fore wing. It has the general group likeness to *anthonomi*. Respectfully dedicated to Elie Metchnikoff.

Habitat: Australia—Queensland (Nelson).

Type: No. Hy/1039, Queensland Museum, Brisbane, the foregoing female.

5. GONATOCERUS HUXLEYI new species.

Female:—Length, 0.95 mm.; moderate in size for the genus.

General color black, the abdomen more brown, distinctly marked with yellow at base; antennæ and venation brown, the scape somewhat paler; coxæ, tibiæ and all tarsal joints brown, rest of legs pallid yellowish. Wings slightly, uniformly embrowned throughout.

Distinct from both *baconi* and *metchnikoffi* but somewhat similar to *haeckeli* and *darwini*, differing from both, however, in a number of points. From *darwini* in general coloration and in bearing broader fore wings; from *haeckeli* in that the discal ciliation of the fore wings extends normally under the venation, in that the tarsi are all brown and in that joints 4 and 6 of the funicle are larger, the fourth joint larger than the first (of the funicle). The fore wings bear about thirty-two lines of discal ciliation. The proximal tarsal joints in the caudal legs are longer here than in *haeckeli*.

Antennæ 11-jointed; funicle joints 1-4 gradually increasing in size, grouped together and opposed to the following four joints which are all distinctly larger; joints 5 and 7 of the funicle subequal, each slightly longer than joint 6 which is cylindrical oval but not quite twice longer than wide; joint 8 of the funicle slightly shorter than joint 7 and slightly stouter; proximal four funicle joints all distinctly shorter than the usual pedicel; club-joint long, cylindrical, tapering slightly distad and thickly covered with minute white dots.

(From one specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen taken from the window of a granary on a wheat farm at Roma, Queensland, October 6, 1911. Dedicated to Thomas Henry Huxley, the agnostic and doubter, champion of reason, truth and Darwin.

Habitat: Australia—Queensland (Roma).

Type: No. Hy/1040, Queensland Museum, Brisbane, the female in foregoing, mounted in xylol-balsam (with specimens of *Signiphora* and trichogrammatids).

6. GONATOCERUS COMPTEI new species.

Female:—Length, 1.00 mm.

General color bright golden yellow marked with black as follows: Faint stripes across the abdomen one to each segment, distal half of abdomen ventrad, most of antennæ, especially the distal three joints; cephalic part of mesonotum rectangularly across the meson, a triangular spot in the cephalic angle of each parapside; several spots along the base of the scutellum and the metanotum obscurely; also tip of the valves of the ovipositor. Antennæ dusky, darker distad, the lateral aspects of scape and pedicel golden yellow; legs yellow throughout, the posterior tibiæ and femora with some black; eyes and ocelli red. Venation dusky yellowish. Wings hyaline or nearly.

Similar in structure to *baconi* nearly but differing thus: The fore wings are somewhat broader, differ in shape and have shorter marginal cilia, the longest of the latter not more than a third of the wing's greatest width; there are about eighteen lines of discal cilia across the widest blade portion. The fore wings do not narrow like a handle proximad (just out from the venation). The proximal joints of the posterior tarsi are shorter and stouter. The caudal wings very narrow, acute at apex, bearing of discal ciliation only a paired line along each margin, its caudal marginal ciliation slightly longer than the longest marginal cilia of the fore wing. Ovipositor barely projecting beyond tip of the abdomen.

Antennæ normal for the genus. Second funicle joint longest, the third next longest or about subequal to it; joint 4 of the funicle a third shorter, not twice longer than wide as with joint 2, very slightly longer than joint 1, which is not quite as long as the small pedicel; joints 5 and 6 of funicle narrower but subequal to 4 and to each other; joints 7 and 8 subequal, longer by a fourth but not so long as joint 2.

(From two specimens, the same magnification.)

Male:—The same, the abdomen darker and also the legs. Antennæ filiform, the club and other funicle joints longitudinally striate; the flagellar joints gradually increasing in length distad, the club intermediate in length between the first and last funicle joints; pedicel shorter than the first funicle joint.

(From one specimen, the same magnification.)

Described at first from three females captured by sweeping in a forest adjoining the hamlet of Nelson, N.Q., February 18, 1912 (A. M. Lea and A. A. Girault). On June 30, 1912 a female was taken at an elevation of 500 feet in a forest at Nelson.

Dedicated to Auguste Comte, the positive philosopher, whose philosophic principles, although not always right, were based upon positivism, materialism, realism or experience combined with reason.

Habitat: Australia—(Nelson and Alooomba, near Cairns; Ingham; Port Douglas, N.Q.).

Types: No. *Hy/1011*, Queensland Museum, Brisbane, one male, one female (mounted on a slide, Nelson, May 26, 1912).

Subsequently a male and female were captured at Port Douglas, N.Q., March 25, 1912 from the windows of a general store. The wings were distinctly stained, the head black excepting narrowly around the eyes and about the clypeus and mouth. Also a pair at Nelson by sweeping floor of forest, May 26, 1912; when dipped in chloroform, they became blood-red. And two males, nine females at Alooomba, N.Q., July 7, 1912, sweeping grass in midforest; a female by sweeping grass and foliage, 1,000 feet, Pyramid Mountain, opposite Nelson, August 17, 1912; and two females at Ingham, N.Q., July 17, 1912 by sweeping grass in a boggy meadow bearing Pandanus.

7. GONATOCERUS CINGULATUS Perkins.

Perkins, 1905, pp. 193, 194, 195-196, pl. XIII, figs. 2, 6. 1906, p. xxiv.

Female:—Length, about 1.00 mm.

General color golden yellow, the base of the abdomen paler; distal half of abdomen, metanotum, much of the head and the antennæ, excepting scape and pedicel, black; antennal scape, pedicel, cephalic portion of mesonotum,* spot at the cephalic corner of each parapside and the legs dusky, suffused with yellowish. Venation dusky. Fore wings uniformly but not deeply stained. Caudal tibiæ darker; sometimes all the femora lighter.

Allied with *baconi* and *comptei* but remarkably like the North American *aureus* Girault. From *baconi* it may be distinguished by the shape of the fore wings which differ as with *comptei* but it resembles *baconi* in coloration. From *comptei* it differs essentially in the length of the proximal funicle joints of the antennæ, with *cingulatus* increasing in length to the fifth joint but in *comptei* funicle joints 4 and 5 are distinctly shorter than either 2 or 3. It differs not very much from *aureus*—but the scape is shorter, the other antennal joints stouter. Nevertheless, it is surprisingly similar.

(From four specimens, magnified the same.)

Male:—Described beyond.

Redescribed at first from four females captured from the windows of an empty dwelling at Thursday Island, Torres Strait, N.Q., Australia, March 13 and 14, 1912.

* See subsequent remarks.

This species should be compared with the North American *aureus* before its validity is accepted. I have compared it with a single female of that species as identified by myself but, although I think it very probably the same species, yet, for the present hold definite opinion in reserve. I could see no difference excepting those mentioned. If it is *aureus*, that species is widely distributed, since it occurs in North America and probably in Europe as I have noted elsewhere.

This is undoubtedly *cingulatus* Perkins, agreeing with his description with the exception of the "two adjacent spots on the front of the mesonotum which do not reach back to the middle." In the above specimens, seen from the dorsal aspect, the whole of the mesoscutum is dusky black except around the lateral and caudal margins; seen from the side, only the cephalic third of the scutum appears black and I believe some mistake has been made. The scutellum is colored in the same way. Also in the foregoing and following specimens the fifth funicle joint is longer than the fourth, the joints increasing in length from 1 to 5, which is longest; 6 and 7 are subequal and slightly shorter than 5, while joint 8 is shorter than 7, distinctly shorter than 5. However, the proportionate lengths vary somewhat and my specimens agree in general with the figure of the female antenna given by Perkins in the place cited. Sometimes joints 5 and 6 are subequal, funicle joint 7 somewhat shorter than either.

I have subsequently found the following specimens, including the male sex and I briefly describe it: A pair captured by sweeping grass near town, Thursday Island, March 13, 1912. A female by sweeping grass in an open forest near Nelson, N.Q., April 18, 1912. This specimen was more robust than usual, the fore wings somewhat broader, the proximal tarsal joints longer but otherwise I could not distinguish between it and the others. Also a male captured on Thursday Island, in a like situation, March 12, 1912 (open forest), and a female at Herberton, N.Q., on a window, December 28, 1911.

The male is the same as the female, the scape and pedicel of antennæ yellow suffused with dusky, the filiform flagellum longitudinally striate, the distal two thirds or half of the abdomen black. The first funicle joint is longer than the pedicel and a fourth shorter than the following joint which with the others increase slightly in length distad, the club-joint only slightly shorter than the one preceding, longer than the proximal funicle-joint.

Habitat: Australia—Queensland (Brisbane, Nelson near Cairns, Herberton and Thursday Island, Torres Strait).

Perkins (1906) records this species from the eggs of *Tettigonia albida*.

8. GONATOCERUS LAMARCKI new species.

Female:—Length, 0.55 mm.

Dusky yellowish brown suffused with golden yellow the base of the abdomen paler, yellow; the legs and antennæ concolorous, the club of the latter darker. Wings as in *cingulatus*.

Closely related to *cingulatus* but differing in the particulars that follow: The proximal tarsal joints are shorter in all of the legs, in the intermediate and posterior legs barely longer than the following joints taken singly; the other tarsal joints are shorter in proportion; the marginal vein of the fore wing is a fourth shorter; the antennal joints are all shorter and stouter, the distal funicle joint longest of the funicle, not shorter for example than joint 5; joint 5 of the funicle is only one and a-half times longer than wide in *lamarcki* while in *cingulatus* it is twice longer than wide; funicle joint 6 in *lamarcki* is distinctly shorter than the preceding and following joint, only slightly shorter in *cingulatus*; moreover it is only subequal to the pedicel in length, longer than the pedicel in *cingulatus*. The one other difference is that of general coloration. Only the distal two funicle joints are longer than the pedicel; they are subequal. Joints 3 and 4 of funicle subequal, each slightly shorter than 5 while the latter is slightly shorter than either joints 7 or 8. Ovipositor reaching only slightly beyond the apex of the abdomen.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured by the sweeping net in an open field (grasses) near Cooktown, N.Q., February 4, 1912.

Dedicated to the great evolutionist Jean Baptiste De Lamarck whose doctrine of the inheritance of acquired characters lives on for ever as a monument to the genius of mankind.

Habitat: Australia—Cooktown, Queensland.

Type: No. Hy/1042, Queensland Museum, Brisbane, the forementioned female on a slide in xylol-balsam (mounted with two females of *Trichogramma australicum* Girault).

9. GONATOCERUS DAVINCI new species.

Female:—Length, 1.30 mm.; large for the genus.

General color black, the immediate base of the abdomen in the dorsal aspect, the cephalic half of the mesopleura, lateral aspects of scape excepting a band at the base just above the bulla and two opposing spots in the middle one at each side, all of the legs excepting distal two or three tarsal joints, most of

caudal coxæ, caudal tibiæ, and some portions of the intermediate tibiæ pale lemon-yellow, the excepted portions black or brownish black. Ventral aspect of pedicel pale yellowish. Venation brown, the wings hyaline.

Allied to the group of species including *haeckeli*, *darwini*, *metchnikoffi* and *huxleyi*, resembling them in general habitus. However, differing from all in color and structurally similar only to the first two and the last. It most closely resembles *huxleyi* and *haeckeli* both in coloration and structure and the valves of the ovipositor are exerted slightly somewhat as in the North American species *rivalis*; but the funicle joints of the antennæ are longer, joint 5 is not twice the length of joint 4 of the funicle as in *haeckeli* but only one and a half times longer; there is no great disproportion between joints 5 and 6 of the funicle, the fourth funicle is not shorter than the first, as in *haeckeli*. Moreover in this species the marginal vein is longer; also the fourth funicle joint is longer than wide here, wider than long in *haeckeli*. The antennal club is also longer. From *darwini* this species may be distinguished in its being much more robust and in most of the points of difference mentioned for *haeckeli*; both wings are broader and the proximal tarsal joints of the intermediate legs are longer, the caudal wings bear much less discal ciliation, only several cilia at the apex. From the species *huxleyi* it differs in being more robust and in bearing a marginal vein of the fore wing which is about a fourth longer, in bearing more naked posterior wings and in having most of the fore wing naked under the venation with the exception of a line or two directly under the marginal vein. However, its longer marginal vein and different coloration must suffice as its characteristic as concerns *huxleyi*. The fore wings bear about thirty-two lines of discal ciliation; their longest marginal cilia are slightly shorter than the longest of the posterior wings and are not a sixth of the greatest wing width.

(From one specimen, the same magnification.)

Male:—Not known.

This description from a single female specimen captured by sweeping in an open forest near Nelson, N.Q., February 18, 1912 (A. M. Lea and A.A.G.). Dedicated to Leonardo Da Vinci, the manly Italian, one of the earliest of scientists.

Habitat: Australia—Queensland (Nelson near Cairns).

Type: No. *Hy/1043*, Queensland Museum, Brisbane, the forementioned specimen in xylol-balsam.

10. GONATOCERUS GOETHEI new species.

Female:—Length, 0.78 mm.

Predominating color pallid yellowish, the thoracic notum, head, distal half of abdomen more or less, antennal club nearly, posterior tibiæ and distal

two tarsal joints brownish. Remaining portions of legs concolorous; venation and remainder of antennæ olivaceous or yellowish dusky, the wings hyaline. Parapsidal furrows along each side margined with a paler color than the brown of the mesonotum. Caudal third of mesoscutum paler.

Resembles very much the species *darwini* from which it differs in general coloration and in having the antennal pedicel somewhat longer, the proximal third of the wing naked with the exception of a single line of discal cilia under the marginal vein and the oblique (disto-caudad) limiting line running from the base of that vein and joining the proximal end of the line under the vein. The discal ciliation does not appear until at a point about half the length of the short marginal vein distad of the latter's apex. The marginal cilia of the fore wing are somewhat shorter and finer. Characteristics then are its coloration and the lack of discal ciliation under the venation; otherwise, it is similar to *darwini*. The mandibles are short, curved, acute and apparently edentate.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured with the sweeping net in an open forest near Nelson, N.Q., January 24, 1912. Dedicated to Johann Wolfgang Goethe, poet, naturalist and monistic philosopher. Later at Nelson, September 5, 1912, I captured a second female, sweeping mixed jungle and forest growths along a streamlet. The distal half of the abdomen in this specimen was brown-black.

Habitat: Australia—Queensland (Nelson, near Cairns).

Type: No. *Hy/1044*, Queensland Museum, Brisbane, the above specimen on a slide in xylol-balsam (mounted with a homotype female specimen of *Aphelinoidea speciosissima* Girault).

11. GONATOCERUS SPINOZAI new species.

Female:—Length, 1.80 mm.; very large for the genus, larger than *darwini*.

Golden yellow, base of abdomen more or less obscurely, two stripes across dorsum of abdomen about the middle, exerted portion of sheath of the ovipositor, two round spots nearly in a longitudinal line near tip of abdomen along the side, two rather large, obscure areas separated at the median line on cephalic margin of scutum, lateral margin of scutellum, flagellum except distal margin of pedicel narrowly and base of the first funicle joint, two distal tarsal joints and venation dusky fuscous; scape the same but golden yellow ventrad and latero-ventrad. Eyes red. Wings hyaline. First abdominal stripe twice or thrice the length of the second. Femora and tibiæ suffused with more or less fuscous.

Differing from the preceding yellow species by its robustness and broad fore and posterior wings. Fore wings moderately broad, somewhat as in *haeckeli* but the marginal vein is long as in *davinci*; they bear about twenty-eight lines of discal cilia; these cilia are less dense than in *davinci*. The marginal cilia of the fore wing are very short cephalad, longest caudo-distad, there only moderately short, shorter than the caudal cilia of the posterior wing which are slightly shorter than the greatest width of those wings. At the apex of the fore wing the marginal cilia are short, only about half or less the length of the longest cilia farther caudad. Posterior wings broad but not widened especially across the apex of their venation, bearing at least six lines of discal ciliation, including those at the margins. This ciliation is not dense. The discal ciliation of the fore wing disappears before reaching the venation. Proximal tarsal joints of all legs long, as long or longer than the marginal vein. Strigil present. Abdomen ovate, the valves of the ovipositor exerted for a length equal to between a fifth and a sixth of its length, the yellow ovipositor long, inserted at base.

Antennæ usual in number of joints, scape and pedicel but the funicle unusual because of the general equality of most of the joints. Pedicel subequal to the second funicle joint. Proximal funicle joint very small, wider than long, not a third the length of the second; succeeding joints cylindrical ovate, longer than wide and more or less alike. However, joints 2 and 8 are about shortest, 3-5 longest, each about a fourth longer than 2, distinctly longer than the pedicel; 5 somewhat the largest, about one and a quarter times longer than wide; joints 6 and 7 subequal, each only slightly longer than 8. Club long. Pubescence of antenna short, white, the funicle and club joints with what appear to be short, white longitudinal sulci, often curved and joining.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a female specimen captured by sweeping along the sides of a footpath, through a forest near Nelson, N.Q., February 16, 1912 (A. M. Lea and A.A.G.). This magnificent species is characterised by its comparatively great size and robustness, its beautiful color pattern, its moderately broad fore wings, its long and slender marginal vein and proximal tarsal joint, the broad posterior wings and the great disproportion in size between the first and second funicle joints.

Dedicated to the profound student and thinker, Baruch Spinoza, who in the seventeenth century introduced the monistic conception of matter, "the loftiest, profoundest, and truest thought of all ages."

Habitat: Australia—Queensland (Nelson, near Cairns).

Type: No. *Hy/1045*, Queensland Museum, Brisbane, the forementioned specimen in balsam.

12. GONATOCERUS BRUNOI new species.

Male:—Length, 0·80 mm.; moderate in size for the genus.

General color golden yellow, the distal half of the abdomen, the antennal flagellum (excluding pedicel), the venation, most of the dorsal aspect of thorax (broken, however, by yellow areas), the tarsi, the intermediate and caudal tibiæ and dorsal aspect of pedicel black. Wings stained, smoky nearly. Allied with *comptei*, *cingulatus* and the other golden yellow species with longer and narrower fore wings but distinguished from all of them in having the fore wings still broader, and the marginal vein long. Thus the fore wings bear about twenty-four longitudinal lines of discal cilia. Also the marginal cilia are coarser. Venation very distinct, long.

Antennæ longitudinally striate, the funicle joints gradually increasing in length but the club joint somewhat shorter; funicle joints about three and a half times longer than broad.

(From six specimens, the same magnification.)

Female:—Not known.

Described from six males captured at Nelson, N.Q., February 16, 1912 by sweeping along a forest path (A. M. Lea and A.A.G.). Dedicated to the monistic philosopher Giordano Bruno, who in the middle ages was a father of monism and a sound thinker at a time when most were under the combined influence of superstition and dogmatic religion.

Habitat: Australia—Nelson near Cairns, Queensland.

Types: No. Hy/1046, Queensland Museum, Brisbane, six males in xylol-balsam on a slide (with two females of *comptei*, and the type of *Oligosita anima* and three others).

13. GONATOCERUS HELMHOLTZII new species.

Female:—Length, 1·00 mm.; moderate in size for the genus.

Dark brown the base of the abdomen yellow; legs pale yellow but the caudal tibiæ brown, also the distal tarsal joints, the venation and the antennæ, excepting the sides of the scape and some of the pedicel obscurely, the exceptions yellowish. Wings hyaline. Coxæ concolorous with the legs. Mesoscutum margined with yellow.

Belonging to the group of allied species which includes *darwini*, *haeckeli*, *metchnikoffi*, *huxleyi* and *davinci* but similar only to the first two; from the last three it may be distinguished by its broader fore wings which bear very fine discal ciliation. From its nearest allies—*darwini* and *haeckeli*—it differs also in the same characteristic; the fore wings are broadly pyriform, the margin of the apex a straight line, the discal ciliation very dense and fine, the widest portion of the blade bearing about thirty-two lines, the marginal cilia short and fine around the apex, longest disto-caudad as usual but somewhat finer and

shorter there than is the case with *darwini* for example; the discal ciliation in the fore wing disappears a short distance distad of the apex of the marginal vein which is not lengthened. The posterior wings are moderately broad, acutely pointed, bearing five or six lines of fine discal ciliation distad (including the lines along the margin which are not distinctly differentiated), the caudal marginal cilia longer than the greatest width of the blade, but only slightly longer, distinctly longer than the mean width of the blade. Scape subequal to club; proximal two funicle joints subglobose, each much smaller than the pedicel, the fourth largest; funicle joint 5 longest of the funicle but only slightly longer on the average than joints 7 and 8, which are subequal; joints 5, 7 and 8 each longer than the pedicel; joint 6 of the funicle smaller, subequal in length to the pedicel or slightly shorter, proximal joints of the tarsi moderate in length. Abdomen conic-ovate, the ovipositor not exerted nor its valves.

(From four specimens, magnified as in preceding species.)

Male:—The same but the abdomen much smaller and ovate, the antennæ filiform and 13-jointed, the joints of the funicle and club longitudinally striate, the color of the whole lighter, the funicle joints all wider than long but variable in length, the proximal two and the club shortest.

(From three specimens, the same magnification.)

Described from three males and four females captured October 20 and 21, 1911 by sweeping the foliage of lantana and other trees in neglected fields near the town of Mackay, Queensland. One of the males had somewhat narrower wings and a short antennal pedicel. Subsequently, I captured a female at Hughenden, Q., by sweeping on the forest-downs, July 14, 1912. This was a small specimen.

Dedicated to Hermann Helmholtz, a man who aided in establishing the great principle of the conservation of energy in all substance.

Habitat: Queensland (Mackay and Hughenden).

Type: No. *Hy/1047*, Queensland Museum, Brisbane. The above males and females mounted together on a slide in xylol-balsam.

14. **GONATOCERUS HUYGHENSI** new species.

Female:—Length, 0.84 mm.

Brown-black, the abdomen brown, the legs and antennæ concolorous excepting sides of the scape and the knees, trochanters and more obscurely, tips of the tarsi, which are pallid. Venation brown. Wings hyaline. Cephalic tibiæ suffused with pallid.

Belongs in the group with *helmholtzii*. From the latter it differs in having all the legs dark, the fore wings narrower, the posterior wings with longer caudal marginal cilia, funicle joints 5 and 7 longer, subequal, each twice longer than wide and each longer than funicle joint 8. From *metchnikoffi* it may be at once distinguished by reason of the much coarser discal ciliation of the fore wing in that species and in having the distal four joints of the funicle much less unequal in length. From *davinci*, in being differently colored, in having a short marginal vein in the fore wing and a longer fifth funicle joint. From *huxleyi*, in lacking the discal ciliation under the venation of the fore wing, in having the proximal joints of the funicle all shorter, the fifth and seventh joints longer and the legs all dark. From *haeckeli* and *darwinii* in bearing the longer fifth and seventh funicle joints and from the former in having the legs dark.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured by sweeping in a jungle near Kuranda, N.Q., November 4, 1911. Dedicated to Huyghens who discovered the vibratory principle of light.

Habitat: Australia—Queensland (Kuranda).

Type: No. Hy/1048, Queensland Museum, Brisbane, the foregoing female mounted in xylol-balsam.

The following table will aid in identifying the foregoing species; since the males agree structurally and colorationally with the females, excepting as concerns the secondary sexual characters, it should serve as well for that sex.

DIAGNOSIS OF THE AUSTRALIAN SPECIES OF *GONATOCERUS* NEES.
FEMALES.

Ovipositor not distinctly exerted nor its valves, rarely subexserted; antennæ with the funicle joints uneven, at least two much smaller than the others. No broad black stripe across the middle of the abdomen.

- I. Species brownish or brownish black, the fore wings broader, more or less oblately rounded at apex or subtruncate there, not narrower and of the graceful type. Yellow or dusky yellow or golden yellow (with one exception—*goethei*) not the predominating color, present only on the thorax, the appendages or base of abdomen. First four funicle joints always each shorter than the pedicel. Marginal cilia always distinctly less than a third the greatest width of the fore wing.
 - A. Fore wings very broad, almost squarely truncate at extreme apex, the discal ciliation very dense and fine, about thirty-two, more or less lines. Posterior wings with five or six lines of discal ciliation, at least distad (inclusive of the lines at the margins; excluding *davinci*).

- Base of abdomen, legs except distal tarsal joints and caudal tibiae, sides of scape and pedicel obscurely, pale yellowish; wings hyaline; mesoscutum margined with yellowish. Proximal four funicle joints small and subglobose, the fifth joint abruptly longer, thrice the size of the fourth. Brown, moderate in size. Fore wings shorter and broader. *helmholtzii* Girault.
- The same but the fore wings more slender, the fifth joint of the funicle not quite twice the length of the fourth, the proximal four funicle joints all longer than wide; mesoscutum apparently not marked with yellowish. *huxleyi* Girault.
- The same as *huxleyi* but the thorax over the cephalic coxae is yellow, the marginal vein longer, the distal two or three tarsal joints blackish; more robust *davinci* Girault.
- b. Fore wings narrower, the discal ciliation varying from fine to coarse, from twenty-five to fifteen lines across the widest portion of the fore wing.
- Discal cilia of fore wing moderately coarse or not dense, only about fifteen lines.
- Base of abdomen only narrowly pallid, also scape and pedicel, proximal half of caudal tibiae, distal half of cephalic femora and four first tarsal joints. Brownish black, wings hyaline. Proximal four funicle joints subequal, more or less globose and small, the distal four subequal, a half longer than the pedicel and each twice longer than funicle joint 4. Ovipositor not exerted *metchnikoffi* Girault.
- Discal cilia of fore wing fine, dense, from twenty-three to twenty-six lines.
- All of body pale golden yellow, excepting dorsal aspect of the thorax, head, flagellum, caudal tibia, venation and two distal tarsal joints; also tip of the abdomen dorsad.
- Fifth funicle joint longest *goethei* Girault.
- Body mostly brown or brown-black.
- Discal ciliation absent under the marginal vein; marginal cilia shorter. Ovipositor subexserted.
- Legs and antennae nearly all dusky; fifth funicle joint about twice longer than wide, plainly longer than the distal joint *huyghensi* Girault.
- Legs and scape of antennae nearly all pallid; fifth funicle joint of antennae about only one and a quarter times longer than wide, only very slightly longer than the distal joint or subequal to it *haeckeli* Girault.
- Discal ciliation present under the marginal vein; marginal cilia longer; ovipositor just reaching to tip of abdomen.
- Legs pallid, marked with dusky; fifth funicle joint one and a half times longer than broad, slightly longer than the distal joint *darwini* Girault.

II. Species bright golden yellow, marked with black, yellow the predominating color; fore wings narrower, graceful, their tips convexly rounded or obtusely pointed, their marginal cilia always distinctly longer than a third of the greatest width of the blade; first four funicle joints not always shorter than the pedicel.

- A. Fore wings narrower, slender, the blade narrowing proximad (out from the venation) like the handle of a paddle, with about fifteen lines of discal cilia across the widest blade portion; longest marginal cilia about two thirds the greatest width of the wing.

Pronotum, distal half of abdomen and the metathorax obscurely, black; head partly dusky; legs, scape and pedicel pallid yellowish, marked with dusky (male)..

baconi Girault.

- B. Fore wings broader, still graceful but not noticeably narrowed proximad, bearing about eighteen lines of discal cilia across the widest part of the blade.

Second and third funicle joints longest, much longer than the following joints of the funicle; thus the third joint is twice longer than joint 6.

Bright golden yellow (sometimes reddish), marked with black spots on the thorax dorsad; distal half of abdomen black and the head obscurely; marginal vein lengthened. Funicle joints 4 and 5 shortest

comptei Girault.

Second and third funicle joints not longest, distinctly shorter than some of the following joints, at least; joint 3 of the funicle somewhat shorter than joint 6.

The distal two funicle joints longest; marginal vein normal in length.

Dusky golden yellow

lamarcki Girault.

The fifth funicle joint longest or subequal to the following; marginal vein lengthened.

Bright golden yellow, marked somewhat as in *comptei*. Scape with its bulla slightly longer than the club

cingulatus Perkins.

- C. Fore wings still broader, bearing about twenty-five lines of discal cilia across their widest portion; marginal vein lengthened.

Distal half of abdomen, funicle, club, most of the thorax dorsad, tarsi and the two hind tibiae black, wings stained

brunoi Girault.

The valves of the ovipositor exerted for a length equal to about a fifth that of the abdomen; antennae with only the proximal funicle joint much smaller than the others. A broad black stripe across middle of abdomen. Very large.

Bright golden yellow, the antennae deep black, excepting sides of scape ventrad; joints of funicle, except the first, all rectangular to subquadrate, subequal in width; both wings broad but graceful. Beautiful

spinozai Girault.

SUBFAMILY MYMARINÆ Howard.

TRIBE ANAPHINI.

GENUS ANAPHES Haliday.

All in normal position.

The following species (*wallacei*) being black and bearing comparatively broad and less graceful fore wings is arranged with this genus rather than with *Anagrus* Haliday.

1. **ANAPHES WALLACEI** new species.

Female:—Length, 0.70 mm.; moderate in size to moderately small for the genus; slender.

General color deep black; base of abdomen, trochanters, knees, all of tibiæ excepting two rings of black at the middle of each half respectively (the tibiæ thus more or less distinctly banded with black, more noticeably and distinct in the posterior tibiæ), all of tarsi except the distal joint, pallid or whitish. Wings hyaline, excepting under the submarginal vein in the fore wing which is dusky. Venation dusky; distal half of antennal pedicel pallid. Coxæ concolorous with the body.

Belongs to the group of species represented by *cinctiventris* Girault, *gracilis* Howard, *goochi* (Enock) and *agilis* (Enock). By comparing it with specimens of the two latter it was observed to differ as follows: From *goochi* (Enock), which resembles *gracilis* and *cinctiventris* more and this species less than does *agilis*, it may be distinguished by reason of the fact that the funicle joints are all longer and cylindrical in *wallacei* and the fore wings narrower. Thus, the habitus is entirely distinct from the three species just named and *wallacei* in reality more nearly resembles *agilis* whose habitus is very similar to it. Besides the minor colorational differences, *wallacei* differs structurally in having the first funicle joint a third shorter, distinctly shorter than the pedicel and not much more than half the length of either the second or third joints; in *agilis* the three proximal funicle joints are subequal in length, the proximal joint somewhat the longest; funicle joints 4 and 5 are subequal in the Australian species, 6 decreasing slightly in length, joint 6 the shortest of the three; in *agilis*, joint 5 is distinctly shorter than either 4 or 6, joint 4 being the longest funicle joint and joint 6 the next longest; in *wallacei* joints 4 and 5 are the longest joints but neither is more than slightly longer than joint 4 (sometimes 2 and 3 are the longest). The fore wings bear much less discal ciliation, especially proximad and the marginal vein is distinctly curved toward its apex forming a footlike termination much like that found in *Stethynium*. In the English species, the marginal vein terminates in an obtuse point.

Discal ciliation of the fore wing confined mostly to the outer half of the wing where it is moderately fine and dense, arranged in about nine longitudinal lines, only one of which extends far proximad to the venation; this is about the third line which extends proximad near the cephalic margin nearly to the apex of the marginal vein. Marginal cilia of fore wing moderately long, at apex shorter than the preceding and following cilia, the longest about seven eighths of the greatest wing width. Posterior wings slightly broader than usual, bearing a paired line of discal ciliation along each margin and distad from the apex a third short line of about half dozen cilia; discal ciliation disappears after leaving the distal half of the wing. Marginal cilia of caudal wings usual, those of the caudal margin moderate, distinctly longer than the marginal cilia of the fore wing at the apex and distinctly shorter than the longest marginal cilia of the fore wing, about somewhat over twice the length of the average width of the blade of the posterior wing. Strigil present. Antennal scape long and slender, much longer than the club which is only about equal to the first two funicle joints combined. Proximal tarsal joints much the longest of the four. Valves of the ovipositor projecting slightly beyond apex of the abdomen but not exerted.

(From two specimens, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from two female specimens mounted in balsam, captured October 6, 1911 from the window of a barn on a wheat farm, Roma, Queensland and on December 7, 1911 from the window of quarters for men on a sugar farm near Nelson (Cairns), N.Q. Respectfully dedicated to Alfred Russel Wallace.

Habitat: Queensland (Roma and Nelson).

Type: No. Hy/1063, Queensland Museum, Brisbane, one female on a slide (Nelson, December 7, 1911).

2. *ANAPHES KANTII* new species.

Female:—Length, 0.50 mm.; small for the genus.

General color dusky black, marked with pale canary or lemon yellow; the caudal half of the scutum, a large spot along each side of the thorax involving the insertions of both wings, somewhat over a third of the abdomen at base and all of the legs, excepting a spot above on the posterior femora, canary or light lemon yellow, the antennæ and venation greyish or dusky; eyes bright garnet. Wings hyaline except some duskiness at base. The spot on caudal femora is dusky black.

At once differing from the preceding species by having short funicle joints in the antennæ. In habitus, like *gracilis* Howard but differing from that species in having the conspicuous yellow on the thorax, in bearing more discal ciliation in the posterior wing (a total of two lines, along the cephalic margin) but otherwise evidently very similar.

(From a single specimen, the same magnification.)

Male:—Unknown.

Described at first from a single female specimen mounted in balsam and captured from a window, Yungaburra, N.Q., December 30, 1911 (A.A.G.). Subsequently, a second female specimen was found, captured at Tolga, N.Q., December 28, 1911, from a window, and a third was captured April 22, 1912, at Nelson from a window.

Habitat: Australia—Queensland (Tolga, Nelson and Yungaburra).

Type: No. *Hy/1064*, Queensland Museum, Brisbane, 1 ♀, Yungaburra (with a female of *Aphelinoidea*).

Dedicated to Immanuel Kant for his *The General Natural History and Theory of the Heavens*.

3. *ANAPHES PAINEI* new species.

Female:—Length, 0.55 mm.

Black, the basal half of the abdomen and the middle part (cephalad of middle) of the thorax orange-yellow, the legs dusky, the antennæ still more so; wings hyaline or nearly.

Like the preceding species, *kantii* but the body colors are deeper and more intense, the legs and antennæ darker; the discal ciliation of the fore wing is much more distinct, arranged in about ten or eleven lines, disappearing along each margin when the venation is reached but in the midlongitudinal line much sooner, at the distal three fourths of the wing; thus across the distal fourth the ciliation is uniform, dividing then and proceeding in a straight-margined oblique line to a point on each margin opposite to the apex of the venation. Therefore, there is in the middle line of the blade longitudinally a long wedge-shaped naked area. The posterior wings bear a paired line of discal ciliation along the caudal margin; this is additional to the cephalic paired line. The distal funicle joint of the antennæ is somewhat longer than in the preceding species. Marginal cilia of the fore wing very long, the longest about equal to the greatest wing width and subequal in length to the caudal marginal cilia of the posterior wing. The fore wing is somewhat more slender than in the preceding species.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female captured on the pane of a window, March 6, 1912, Thursday Island, Torres Strait, N.Q., Australia. Dedicated to Thomas Paine.

Habitat: Australia—Queensland (Thursday Island).

Type: No. *Hy/1065*, Queensland Museum, Brisbane, the foregoing species in xylol-balsam.

4. **ANAPHES LAPLACEI** new species.

Female:—Length, 1.50 mm. Body long and slender, resembling that of a thrips.

Deep glossy black, the trochanters, knees and tips of femora, a wide ring around the tibiæ between base and middle, tips of tibiæ broadly, the long proximal joint of tarsi (especially the posterior tarsi) and the apex of the antennal pedicel narrowly, whitish yellow; coxæ concolorous with body, eyes dark garnet; venation dusky blackish; suture along side of abdomen narrowly, more or less whitish. Wings subhyaline to hyaline, no distinct fumation.

Like the species *wallacei* in structure but differing in that the antennæ and abdomen are longer, more especially the latter which is distinctly longer than the combined length of the head and thorax. The fore and posterior wings each bear several more longitudinal lines of discal cilia, the proximal tarsal joints are longer and all of the antennal joints. Otherwise, very similar in all points to the species named. The thorax has scaly sculpture.

(From three specimens, the same magnification.)

Male:—Not known.

Described from three female specimens captured by sweeping grasses on the forest-downs near Hughenden, Queensland, July 13 and 14, 1912. Several thrips were captured at the same time and this mymarid so closely resembled them that it was not at first recognised as being different. July 13 was cold for the tropics, cloudy and windy, the temperature about 65 deg. Fahrenheit.

Habitat: Australia—Hughenden, Queensland.

Types: No. *Hy/1072*, Queensland Museum, Brisbane, two females on a single slide in xylol-balsam (July 14, 1912).

The above species is dedicated to the great Laplace.

GENUS ANAPHOIDEA Girault.

All in normal position.

1. ANAPHOIDEA HARVEYI new species.

Female:—Length, 0.60 mm.; small for the genus. With a peculiar habitus for the genus. Black with a broad whitish band around base of abdomen. Scape serrate beneath, funicle joints of antenna irregularly unequal. Fore wings shaped as in *Stethynium*. Valves of the ovipositor slightly exerted.

General color deep velvety black; base of abdomen, venation, flagellum (pedicel plus funicle plus club) of antenna and all of legs pallid yellow, uniformly so. Wings hyaline. Scape dusky, nearly concolorous. Antennal club slightly suffused with dusky.

Fore wings shaped as is typical for the genus *Stethynium* Enoch, the marginal ciliation with the same arrangement, the longest cilia of the fore wing somewhat over half that wing's greatest width, the discal ciliation not dense, moderately fine and though the fore wings are moderately broad, they bear only about ten longitudinal lines of ciliation across their widest portion. Discal ciliation absent under the venation but there is a fine line of cilia running disto-caudad obliquely to the caudal wing margin from the centre of the marginal vein; the latter moderate in length, its upper margin bisinuate, convex at the middle and acute at apex. Caudal wings slender, with a paired line of discal cilia along each margin, without other discal ciliation excepting one or two cilia at extreme apex in the midlongitudinal line; its caudal marginal cilia nearly as long as the longest marginal cilia of the fore wing, distinctly twice the length of the rather short marginal cilia at the apex of the fore wing; but those of the cephalic margin of the caudal wing are not as long as the blade is wide, but nearly so. Caudal dilatation of fore wing very weak, barely indicated by a slight emargination.

Abdomen conic-ovate, somewhat shorter than the thorax, the valves of the ovipositor distinctly exerted but for no length, somewhat as in *Gonatocerus rivalis* Girault or as in the trichogrammatid genus *Neotrichogramma* Girault. Legs normal, the four tarsal joints moderately short, not differing greatly in length, the third about shortest; tibial spurs single, weakest on the intermediate tibiae, on the posterior legs nearly as long as the proximal tarsal joints, slenderer and longer on the cephalic legs there curved but apparently not forked and no strigil is formed. Mandibles weakly quadridentate, the two inner teeth weak, all teeth obtuse.

Antenna 10-jointed, the club obliquely divided. Scape moderately long, convex along the ventral margin and there showing some serration doubtless due to a sculpture like that of overlapping plates; pedicel small, gracefully enlarged distad and there truncate; funicle with the joints peculiarly, irregularly

unequal, joints 1, 2, 4 and 6 more or less alike and subequal, joints 3 and 5 long, the others short. Funicle joints 1 and 2 subequal, oval, not much longer than wide, 2 somewhat larger, neither as large as the pedicel; joint 3 abruptly longer, cylindrical, over twice longer than wide, twice the length of joint 2 and nearly twice the length of joint 4 which is ovate and slightly larger than 2, the largest of the short joints; joints 5 cylindrical ovate, shorter than 3 but broader, a third longer than 4 and nearly twice the length of 6 which is globular, subequal in length to 2 but broader. Joint 4 slightly shorter than the pedicel. Club conic-ovate, its proximal joint shorter, plainly less than half of its length. Club slightly longer than the three joints preceding (joints 4, 5 and 6 of the funicle). Pubescence of antenna thin.

(From one specimen, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the pane of a window in workmen's quarters on a sugar farm near Nelson, N.Q., December 19, 1911. Dedicated to William Harvey who discovered through the use of his common sense the circulation of the blood in animals, at the time when individual thinking was prohibited and abhorred and individual experience thought to be worthless in research.

Habitat: Australia—Queensland (Nelson).

Type: No. Hy/1066, Queensland Museum, Brisbane, the forenoted female on a slide (mounted with the type female of *Alaptus newtoni* Girault).

If the club of the antenna of this species was 3-segmented, it would pass very well as a typical species of *Stethynium*; but one of exceptional color, being black. Thus it differs from the American and English species of the genus, forming all of its species, very much in habitus, as much as a typical *Anaphes* differs from a typical *Stethynium*; moreover it lacks the strong strigil present in the other species of its group. I cannot, however, consider the species generically distinct from *Anaphoidea* unless the absence of strigils, taken in conjunction with its different habitus should prove of sufficient value to form a good basis for it. Structural differentiation, it seems to me, should be the only basis for any such separation.

2. ANAPHOIDEA GALTONI new species.

Female:—Length, 0.75 mm.; moderately large for the genus, more robust.

General color deep black, the wings uniformly, lightly fumated throughout, the antennæ concolorous (pedicel lighter toward tip), the legs dusky, subpallid at the trochanters, knees and tips of tibiæ. Venation dusky. Habitus entirely distinct from that of the preceding species but agreeing with the North American and English species.

Differing from all the described species of the genus in having the fourth funicle joint distinctly shorter than either the third or fifth joints and having the second funicle joint slenderer and distinctly longer than the third joint, more than four times the length of the proximal funicle joint. Allied with *sordidata* but upon comparison found to differ as follows: In the antennal structure pointed out; otherwise practically the same. Parapsidal furrows complete; posterior wings with about seven cilia in the midlongitudinal line of discal ciliation. Antennæ 10-jointed, the club divided. Tarsi 4-jointed. Fourth funicle joint subequal in length to the pedicel; funicle 1 shortest, 4 next so but over twice the length of 1, joint 6 next shortest yet broadest of the funicle joints.

(From a single female specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen captured by sweeping miscellaneous vegetation along the outskirts of the town of Roma, Queensland, October 5, 1911 (A. A. Girault). Dedicated to Francis Galton who was a pioneer in the application of biological laws to human society.

Habitat: Australia—Roma, Queensland.

Type: No. *Hy*/1067, Queensland Museum, Brisbane, the above female.

3. ANAPHOIDEA LINNÆI new species.

Female:—Length, 0.53 mm.; moderate in size for the genus.

Black, the legs pallid yellowish, the antennæ black, the wings, except at base, distinctly, uniformly fumated throughout. Scape and pedicel of antenna suffused more or less with yellowish. Eyes dark garnet.

Fore wings slender and curved, shaped somewhat as in *Anagrus* but much broader, shaped more like those of *Anaphes sinipennis* but yet still broader and somewhat shorter, their longest marginal cilia slightly longer than their greatest width; fore wings bear about from eight to nine lines of discal cilia. Caudal wings also curved, with the white dots along the posterior margin, with the discal ciliation usual for the genus at each margin and with a short midlongitudinal line of from four to six cilia running from the apex. Antennæ 10-jointed, the club divided obliquely, the two joints about equal; shaped somewhat as in the North American *conotracheli*, the second joint slender, subequal to each of the following three joints which are wider; distal funicle joint distinctly shorter than either of the four preceding joints; proximal funicle joint subquadrate, not half the size of the pedicel nor more than somewhat over a fourth the length of the second or following joint. Pubescence of antenna short and

soft. Proximal joint of tarsi longest of the four tarsal joints, about thrice longer than wide. Either of joints 2-5 of the antennal funicle is longer than either of the two club-joints.

Distinguished at once from the other two Australian species by the curved fore wings bearing coarser ciliation; specifically from *galtoni* by the narrower fore wings and shorter antennal joints and colorless legs; in *galtoni* the fourth funicle joint almost abruptly narrows and shortens while the second funicle joint is longer than with *linnæi*; also the latter has pallid legs. From *harveyi*, this third species may be distinguished with great ease, since the former is entirely different in structure, the fore wings broad as in *Stethynium*, the abdomen more conical, the third funicle joint abruptly much longer than the globular second and the longer distal joint of the club; moreover, the coloration of *harveyi* is different.

As regards the North American species, *linnæi* is closer to *pullicrura*; from *sordidata* it differs in being smaller, in bearing shorter funicle joints, especially the narrower second joint and the wings are narrower; from *conotracheli* by the pallid legs and shorter antennal and tarsal joints. Otherwise it is surprisingly like the lastnamed species.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured rather early in the morning (eight o'clock) from a window in a private residence at Nelson, N.Q., July 9, 1912.

Habitat: Australia—Nelson near Cairns, N.Q.

Type: No. *Hy/1071*, Queensland Museum, Brisbane, the above female in xylol-balsam.

GENUS ANAGRUS Haliday.

All in normal position.

1. ANAGRUS FREQUENS Perkins.

Perkins, 1905, pp. 190, 191, 193, 194, 198, 199, pl. XII, fig. 6. Id., 1906, i, xiv, xv, xxiv, xxxi. See statements beyond.

2. ANAGRUS LUTULENTUS Girault.

Girault 1911 a, pp. 135-137.

Perth, West Australia. Host unknown.

3. ANAGRUS BAERI new species.

Female:—Length, 0.43 mm.; moderately small for the genus; smaller than *brocheri* Schulz. Differing from the foregoing species (*frequens*) in coloration and antennal segmentation, the second funicle joint shorter than the third and sixth.

General color sooty or dusky or greyish, the thorax pallid yellowish as are the scape, pedicel and legs. Differing from *armatus* Ashmead, which, according to Perkins, agrees nearly structurally with *frequens*, in the following particulars: The fore wings have a more pronounced caudal dilatation and are distinctly broader on the average (about 7 longitudinal lines of discal ciliation) and the second funicle joint of the antennæ is distinctly shorter, shorter than the third and sixth. Of the North American species in antennal structure, *baeri* is closer to *epos* than to any other. But upon actual comparison of specimens the following differences are to be observed: The funicles of the antenna are similar in shape but in *baeri* the individual joints are shorter, the fore wings are similar in most arrangements but they differ in shape, the margins are more parallel in *epos* and in the latter the discal ciliation of the fore wing is longer, especially noticeable along the margin of the apex; specifically the caudal margin of the fore wing in *baeri* never becomes convex distad but in *epos* it becomes gently convex just at the widest portion of the blade. The differences between the two species are not abrupt, yet apparently actual, but it is a question whether or not they can be separated without actual comparison of the two. One should not be at all surprised to find them the same.

(From one specimen, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the foliage of a wild, imported citron, growing near the jungle and infested with coccids and leafhoppers, Babinda, N.Q., October 29, 1911. Dedicated to Carl Ernest Baer the founder of embryology, who after Caspar Wolff, completely refuted the theories of scatology and preformation and brought ontogeny to a monistic basis.

Habitat: Australia—Babinda, Queensland.

Type: No. Hy/1049, Queensland Museum, Brisbane, Queensland, the foregoing female.

Some while after writing this section on *Anagrus* I captured at several points along the coast of North Queensland what I thought were undoubtedly specimens of *Anagrus frequens* Perkins. These were taken from windows; in an empty dwelling at Herberton, December 28, 1912, two females; in a carpenter's shop at Innisfail (Geraldton), January 11, 1912, one female; and from a window

in workmen's quarters on a sugar farm near Nelson, January 22, 1912, a female. The latter specimen stained xylol-balsam pink, having been mounted alive*; the first two had been in alcohol before being mounted. These specimens agreed in coloration, being yellow with three broad dusky stripes across the body from lateral aspect, one at the cephalic part of the thorax, one across the base of the abdomen, and one across the abdomen, not at but near the tip. They differ from the brief description of *frequens* given by Perkins in the following particulars: The proximal funicle joint of the antennæ is yellow like the scape and pedicel. The ovipositor is exerted distinctly but shortly. The fourth funicle joint of the antennæ is as wide as the fifth and sixth, not slender like the second and third joints as represented in the figure accompanying the original description. However, these differences might easily have happened through variation or by differences due to the mount of individual specimens. But there are other differences; the second funicle joint of the antenna is not so long as figured for *frequens* and as in the specimen of that species noted farther on in this section. It is less robust, the discal ciliation of the fore wing less conspicuous. For these reasons I had intended to rename these specimens, identifying another one captured later with *frequens*. The color in them is lemon-yellow, the legs, scape, pedicel and first joint of funicle being concolorous. I have since seen these specimens: Two females captured from a window in a shop in the little mining site of Rossville, N.Q., February 23, 1911. Another apparent difference between them and *frequens* is that in the former there is a tendency for one line of discal ciliation to be absent, the intermediate line from the cephalic margin. The scape, ovipositor and proximal tarsal joint of caudal legs are all somewhat longer in *frequens*. The color pattern of thorax and abdomen appears to be the same as in *frequens* and *Paranagrus*. The caudal tibiæ and tarsi may sometimes be dusky.

However, after much consideration, I believe the above specimens are all *frequens*. As regards the latter, I believe there can be no doubt but what I have correctly identified it in a female specimen captured from a window at Nelson, April 30, 1912. The specimen was stupefied with chloroform and mounted alive in xylol-balsam which it stained in the immediate site of its body a deep pink. The color pattern on the thorax is the same as that of *Paranagrus perforator* and I noticed that the two adjacent spots on the mesonotum became fused after the specimen had been mounted. I quite agree with Perkins when he states regarding *armatus* Ashmead "apparently almost identical with the preceding in form and structure," the word "preceding" referring to *frequens*. He has stated also "*Anagrus frequens*, under which name are probably more than one species, or at least one or two distinct races of a single species" and has pointed out the characteristic of *frequens*

* April 30, 1912, all pinkness in the mount had disappeared, the specimen pale lemon, marked as described. It was probably faint, the pinkness.

as compared with *armatus*; but this characteristic at the best is obscure since some specimens of *armatus*, mutilated perhaps, may possess it. It behooves us, therefore, to make a careful comparison of this species with the North American *armatus* Ashmead, its ally, *spiritus* Girault and the European *Anagrus brocheri* Schulz. As concerns *armatus* there are certainly no discernible differences except those stated and certain thoracic structures—the scutellum of *frequens* is longer at the median line, its cephalic margin more convex, its greatest length distinctly longer than that of the smaller triangular sclerites following (caudad), whereas in *armatus*, the scutellum is wider and flatter, its greatest length distinctly shorter than the length of the following paired sclerites. But I find later, that this character varies considerably in *armatus* and cannot be used for distinguishing purposes. The color pattern of *armatus* is like that of *frequens* sometimes but there may occur nearly immaculate specimens and ones with the abdomen entirely black. The scape is finely serrulate along its ventral margin in both species. In fact, the two are not separable at all and I therefore conclude them to be the same. Like all widely distributed species, *armatus* is very variable, its color extremely so, its fore wings vary much in width, comparatively speaking and the antennæ also somewhat but the relation of the joints remain about the same; the length to which the ovipositor is exerted also varies according to the position of the mount. Gross appearances, experience teaches us, will be found as useful in separating species of this genus as in any other and profound subtleties and refinements will only lead to involved difficulties in the great majority of cases.

As regards the North American species *spiritus*, a close ally of *armatus* and a species whose identity has puzzled me considerably (even though described by myself), I must conclude that as with *frequens* I am unable to separate it from *armatus* with which it must be considered identical. The naked area in the fore wings in any of these *ci-devant* species is too variable for a specific character; it is very seldom clearly delimited and to separate species on it alone would be like attempting to distinguish the leaves from the same tree so that they would always fall into distinct groups. We must include *armatus* (= *columbi* Perkins), *frequens* Perkins and *spiritus* Girault in the same category and conclude that *armatus* occurs in Australia. Incidentally it may be mentioned that *spiritus* was separated from *armatus* on the same supposed characteristic as was *frequens*; but also, it has broader fore wings and I now pronounce it a variety of *armatus*.

This brings us to the European species resembling *armatus*, namely *incarnatus* Haliday and *brocheri* Schulz. I have re-examined a female specimen of *brocheri* and it seems obviously distinct though it is difficult to point out just its characteristics. However, the brownness of its whole body (there being no yellow) is one and a peculiarity of the fore wings, which seem to be stiffer

both in regard to shape and ciliation, the discal cilia erect, distributed uniformly, a second. As regard *incarnatus*, I also believe that it is distinct, as I once separated it from *spiritus*. But, having once done this, does not relieve the suspicion with which *armatus* must be viewed when *incarnatus* presents itself. The species *armatus* is thus subcosmopolitan. I recapitulate its history for convenience, herewith:

ANAGRUS ARMATUS (Ashmead).

Litus armatus Ashmead, 1887, p. 193.

Eustochus xanthothorax Ashmead, ib., pp. 193-194.

Anagrus frequens Perkins, 1905, p. 198, pls. XII, fig. 6; XIII, fig. 8. (See above).

Anagrus columbi Perkins, 1905, pp. 193, 194 and 198, pls. XII, fig. 6; XIII, fig. 8a. id., 1906, pp. i, xxiv, xxxi.

Anagrus spiritus Girault, 1911 b, pp. 207-210.

Anagrus armatus (Ashmead)—Girault, 1911 c, pp. 289-292.

Synonyms: *Eustochus xanthothorax* Ashmead; *Anagrus frequens* Perkins; *Anagrus columbi* Perkins; *Anagrus spiritus* Girault.

Varieties: *nigriventris* Girault.

spiritus Girault.

australiensis Girault, novum.

Habitat: North America—United States (Florida, Ohio, Illinois, Maryland, Colorado, New York, and Iowa). Australia—North Queensland (Herberton, Innisfail, Nelson near Cairns and Rossville near Cooktown). Fiji—Suva. Sandwich Islands—Oahu at least.

The Fijian specimen I captured myself at Suva, September 22, 1911, on a window in a livery stable. It was nearly uniformly yellow in colour. The following specimens should also be recorded: A female captured at Nelson, N.Q., with a female of *Paranagrus perforator* on a window of a building on a sugar farm (April 20, 1912). In the original description of *frequens*, Perkins had stated: "An apparently different race inhabits Fiji, but I cannot separate it specifically."

In regard to variation in *armatus*. It should be mentioned that the distal three funicle joints of the antenna are sometimes much shorter than usual, which gives the appearance of being characteristic. Also that the Queensland specimens are usually but not always marked with the moderately broad black stripes across the body, as seen from lateral aspect, one across the cephalic end of the thorax, one across the abdomen and one across the latter's tip. This appears to be so characteristic that I hereby name specimens so marked as the new variety *australiensis*.

Type of variety australiensis: No. Hy/1050, Queensland Museum, Brisbane, 1♀ in xylol-balsam (Nelson, N.Q., April 30, 1912).

Subsequently at Nelson, N.Q., I captured single females of this species from windows on August 3 and September 2, 1912; they were both the variety *australiensis*.

GENUS PARANAGRUS Perkins.

For the present, I accept this as a distinct segregate of generic value, but doubtless it will finally be classed as a subgenus. The longer proximal funicle joint is its only characteristic, excepting a greater slenderness and apparently a characteristic color pattern on the thorax and in the discal ciliation of the fore wing (minors).

1. PARANAGRUS OPTABILIS Perkins.

Perkins, 1905, pp. 188-190, 191, 193, 194 and 199, pls. XII, figs. 1 and 2; XIII, figs. 3, 4, 5, and 5a; Idem, 1906, pp. x, xi, xiv, xv, xvi, xxiv, xxix and xxxi.

“*Hab.*: Queensland; bred in all localities from the eggs of *Perkinsiella saccharicida*. A very similar form inhabits Fiji, but the material is insufficient to determine whether they are specifically identical.” I have not taken this species in Queensland.

2. PARANAGRUS PERFORATOR Perkins.

Perkins, 1905, pp. 191, 193, 194, 199. *Ib.*, 1906, pp. xiv, xv, xvi, xxiv and xxxi.

Female:—A specimen agreeing in color pattern with *perforator* Perkins and in general coloration orange-red, turning in balsam to a beautiful pink, also staining the surrounding medium the same color. It differs from the original description of *perforator* not at all but the antennal and wing characters are not given in the description. But it agrees with the original description of *optabilis* with the exception of its general coloration and the exerted ovipositor. Its antennæ agree with the figures given of *optabilis* by Perkins (i.e.) as do also the wings and tarsi. The fore wings are very slender and curved, with very long marginal cilia and with one long midlongitudinal line of discal cilia, proximad reaching to the end of the venation; also, at the apex of each side of this line there are two (cephalad) and one (caudad) short lines of cilia, the mesal one of the two cephalic lines, longer; there is also a paired line of discal ciliation along each margin of the blade. The narrow, straight posterior wing bears a paired line of discal cilia along the caudal margin (not close together) and a single line along the cephalic margin. Strigil present. The male is not known. The species originally was described from Fiji, reared from the eggs of delphacid leafhoppers of different genera. The valves of the ovipositor are exerted for a length equal to the three basal joints of the hind tarsus.

The foregoing notes were made by examining a single female specimen captured at Nelson (near Cairns), N.Q., April 20, 1912, from a window in men's quarters on a sugar farm. It was stupefied with chloroform and mounted then in xylol-balsam. There can be but little doubt that the specimen is correctly identified. On May 18, 1912, another female was captured in the same place. By that date, the first specimen had become in balsam a dull honey-yellow, but a pink cloud still surrounded the body. In neither specimen were the valves of the ovipositor exerted for a length greater than the combined length of the first three joints of the posterior tarsus. From the same window, a female was captured on June 14 and 20, 1912.

GENUS STETHYNIUM Enoch.

All in normal position.

1. STETHYNIUM DALTONI new species.

Female:—Length, 0.75 mm.; moderate in size for the genus.

General color pinkish yellow, light yellow suffused with pinkish, the antennal funicle and club and all distal tarsal joints smoky brown or dusky. Venation concolorous with the body or somewhat darker. Wings hyaline. Eyes and ocelli ruby-red. Pronotum and extreme tips of abdomen dusky.

Closely allied with the American *faunum* Girault and the English *triclavatum* Enoch by bearing normal posterior wings but differing from the former in bearing moderately narrow fore wings (only about twelve longitudinal lines of discal ciliation at the widest blade portion) which are not so characteristically shaped and more obtuse at apex. From the American species in having the second funicle joint of the antennæ shorter. The marginal cilia of the fore wing are nearly as long at the apex of the wing as they are along the cephalic margin where the longest are between a third and a half of the greatest wing width. The venation of the fore wing is characteristically shaped, as in *triclavatum*. The caudal wings bear a paired line of discal cilia along each margin and its marginal cilia at the cephalic margin are about as long as the blade's greatest width. Tarsal claws all moderate in length. Discal ciliation of the fore wing moderately fine, not very dense.

Antennæ 11-jointed, distinctly clubbed, the club 3-jointed, the joints all of subequal length, the region conic-ovate and as long as the distal four funicle joints combined. Scape not much longer than the pedicel, while the latter is only slightly longer than the proximal funicle joint; all funicle joints excepting 5, longer than wide, 2 longest, $2\frac{1}{4}$ times longer than wide; 1 and 3 subequal, a fourth shorter than 2; 4 still shorter and somewhat broader, oval; 6 somewhat larger than 4; joint 5 smallest subhemispherical, wider than long. Club joints each subequal to the pedicel. Pubescence of funicle scraggly and thin.

(From one specimen, 1/6-inch objective, 2-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the pane of a window in a barn, State Farm, Roma, Queensland, October 6, 1911 (A.A.G.). Dedicated to the discoverer of the atomic theory in chemistry.

Habitat: Australia—Queensland (Roma).

Type: No. *Hy/1056*, Queensland Museum, Brisbane, 1 female in xylol-balsam (mounted with a female of *Oligosita americana* Ashmead).

2. **STETHYNIUM MAYERI** new species.

Female:—Length, 0.80 mm.

General color uniformly lemon-yellow, the legs concolorous, the antennal club and distal four funicle joints dusky, the eyes and ocelli bright red; distal tarsal joints concolorous with the legs and body; fore wings hyaline but with a slight suffusion of duskiness proximad. Venation concolorous. Ocelli in a triangle in the centre of the vertex, the lateral ocelli elliptical, distant from the eye margins, each closer to the cephalic ocellus than to the other. Fore wings moderately narrow, bearing about twelve longitudinal lines of discal ciliation, the latter moderate; the longest marginal cilia of the fore wing are slightly over three fourths its greatest width but at the cephalic margin at apex only about a fourth of the wing's greatest width, shortest at the apex, here not half the length of the cilia along the caudal margin of the posterior wing and abruptly shorter than the longer cilia disto-caudad. Posterior wings narrow, acuminate, curved like a sabre, their marginal cilia at the caudal margin about twice longer than the blade's greatest width, those of the cephalic margin somewhat longer than the blade is wide but not half the length of the caudal cilia. Discal ciliation of the posterior wing absent excepting a paired line along each margin and a short midlongitudinal line of about 5-6 cilia running from the apex between the lateral lines. Fore wing obtusely pointed and with the peculiar arrangement of the discal cilia and the peculiarly shaped venation. Parapsidal furrows complete. Eyes naked. Tarsi 4-jointed, the joints all moderately long and subequal, shortening somewhat distad; strigil present. Vertexal carina present. Abdomen sessile, conic-ovate, subequal to the thorax in length, the ovipositor not exerted.

Antennæ 11-jointed, characteristic because of the unequalness of the funicle joints. Scape about twice the length of the pedicel, subcylindrical, longest. Pedicel slightly shorter than the first funicle joint; first three funicle joints cylindrical, 2 distinctly longest of the three, 1 shortest, slightly shorter than 3; funicle joint 4 is slightly shorter than 1 whereas joint 5 is distinctly longer and stouter, as long as 2 and stouter than it, cylindrical-ovate; the distal

joint (6) abruptly shortened, about half the length of 5 and the smallest antennal joint; here, from joint 3 of the funicle, we have alternately long and short joints. Club conic-ovate, its intermediate joint shortest, its proximal joint longest, slightly longer than the cone-shaped terminal joint; the club is longer than the three distal funicle joints combined and longer than the scape. Pubescence of antenna short, moderate.

(From one specimen, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured while crawling over the foliage of *Eucalyptus* in a forest, Nelson, Queensland, November 19, 1911.

Habitat: Australia—Queensland (Nelson, Cairns District).

Type: No. Hy/1057, Queensland Museum, Brisbane, Queensland, the foregoing female on a slide in xylol-balsam.

This species differs from *daltoni* in having the distal tarsal joints, tip of abdomen and the proximal funicle joints of the antennæ concolorous and being a shade different in general coloration. Structurally its antennæ are very different; for instance, funicle joint 5 is shortest in *daltoni* but nearly the largest in *mayeri*; none of the joints are wider than long in *mayeri*; in general, the funicle joints are all longer in *mayeri*. There are other differences which are pointed out in the table of species. From the American and English species it may be distinguished by its unequalness in the antennal funicle, the alternately long and short distal four joints. Respectfully dedicated to Robert Mayer, who with Hermann Helmholtz discovered the law of the conservation of energy.

3. STETHYNIUM LAVOISIERI new species.

Female:—Length, 0.68 mm.

General color dusky yellowish, the legs very pallid, contrasting, the antennæ concolorous. Fore wings hyaline, slightly clouded beneath venation. Caudal wings noticeably clear, translucent and white, immargined.

This species differs at once from the preceding two in being more characteristic of the type of the genus; its wings are broader, more densely ciliate and with the marginal ciliation arranged more characteristically; also at the caudal dilatation, the immargination is pronounced. It differs from *daltoni* structurally in just the points mentioned and from *mayeri* more so along the same lines, but more especially in antennal structure.

Fore wings moderately broad, broadest about midway between the end of the venation and the wing apex but very slightly pointed obtusely, its caudal

margin changing angle at the widest portion of the wing, the marginal cilia long, abruptly lengthened disto-caudad, the longest somewhat over three fourths the greatest wing width. Discal ciliation of the fore wing fine and dense; arranged in about seventeen longitudinal lines across the widest portion of the blade. Caudal wings perfectly white and translucent, their discal ciliation arranged in a paired line along the caudal margin, a single line along the cephalic margin and a short midlongitudinal line of four or five cilia, scattered from near the apex; all of the discal ciliation is colorless and nearly invisible. The caudal wings in this species are characteristic; they are broader than those of *daltoni* and not margined with dusky and hence not defined so well; their marginal cilia are longer and more conspicuous. Mandibles tridentate. Tarsi 4-jointed, the joints short; tip of ovipositor slightly exerted. Abdomen conic-ovate, subequal in length to the thorax.

(From three specimens, the same magnification.)

Male:—The same. Abdomen much shorter; antennæ 13-jointed, the flagellar joints longer than wide, longitudinally striate, the proximal and distal two joints of the funicle longest and subequal, the second funicle joint somewhat the longest.

(From one specimen, the same magnification.)

Described at first from three female specimens captured October 26, 1911 while crawling over the foliage of a species of *Eucalyptus* (bastard gum) infested with leafhoppers and probably parasitic on the eggs of some homopterous insect. A species characterised by the colorless legs and caudal wings, the shape of the latter and the fore wings and the ciliation of the latter. Subsequently the following specimens: In the same place as formerly, one female on November 29 and two on November 30, 1911; on the latter date also a male. A female at Herberton, N.Q., December 28, 1911 from a window in an empty dwelling.

Habitat: Australia—Queensland (Nelson and Herberton).

Type: No. *Hy/1058*, Queensland Museum, Brisbane, one female in xylol-balsam (Nelson, October 26, 1911).

Dedicated to the discoverer of the law of the conservation of matter.

4. *STETHYNIUM CUVIERI* new species.

Female:—Length, 0.30 mm.; minute for the genus and family. Visible to naked eye as a minute dot but not as small as species of *Alaptus*.

General color pallid lemon-yellow,* the abdomen suffused with dusky; eyes and ocelli ruby-red; antennæ and legs concolorous with the general body color or somewhat paler; wings hyaline.

* Color changes to orange in xylol-balsam.

A species characterised by its minuteness and the following characters: The fore wings are narrow, bearing only about ten longitudinal lines of discal ciliation, their longest marginal cilia distinctly longer than their greatest width, those at the apex of the wing are long; the wings themselves are more graceful than usual with the genus; the joints of the funicle of the antenna are all short and subquadrate, only the second, fourth and sixth longer than wide, the joints alternately smaller and larger; caudal wings with only three lines of discal ciliation. The species is more plainly characterised in the table of species following.

(From one specimen, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from one female mounted in xylol-balsam and captured from a leaf of bastard gum in a forest, Nelson, N.Q., November 29, 1911.

Dedicated to Georges-Léopold-Chrétien Frédéric-Dagobert Cuvier, the great comparative anatomist.

Habitat:—Queensland (Nelson, Cairns District and Herberton).

Type:—No. *Hy/1059*, Queensland Museum, Brisbane, 1 female in xylol-balsam (mounted with a male of *Oligosita minima* Girault, Nelson November 29).

Subsequently a female from a window in an unoccupied dwelling, Herberton, N.Q., December 28, 1911; another at Nelson, December 22, 1911, from a window in men's quarters on a farm and one from the foliage of a bastard gum at Nelson, November 30, 1911; also a female from a window, Nelson, April 21, 1912.

5. *STETHYNIUM VESALII* new species.

Female:—Length, 0.50 mm.

The same as *lavoisieri* but the fore wings are narrower, also the posterior wings but yet still the same color. The general color is bright lemon-yellow, the legs and antennæ, excepting the concolorous scape, colorless like the posterior wings. The antennæ and fore wings are more nearly like those of *daltoni* but *vesalii* differs from the latter in not having the dusky antennal funicle, in bearing a longer distal club joint, joint 2 of the funicle shorter than in the other species yet longest, somewhat longer than wide and joint 5 longer than wide, but not much more so; the caudal wings bear longer cephalic marginal cilia, the fore wings a somewhat different outline; also the distal tarsal joints are pale, the blade of the fore wing more convex along the distal half of the caudal margin and apparently the sulci are absent on the scutellum (a median sulcus along the phragma). From *lavoisieri*, this species differs mostly in

bearing much narrower fore wings, though they are nearly the same shape. In *lavoisieri* the fore wings are nearly twice the width of those in *vesalii* while the funicle joints are all subglobular. It is most closely related to *cuvieri*, differing only in the broader fore wings (about fourteen longitudinal lines of discal cilia) which are slightly wider than or subequal in width to their longest marginal cilia. Thus, it appears to be a species intermediate between the minute species and *vesalii*. Its colorless and somewhat broader posterior wings, broader fore wings, greater size (over twice the size of the smallest species) and longer distal club joint are its characteristics when compared with *cuvieri*. It is the same size as *Oligosita minima* Girault.

(From seven specimens, the same magnification as for the preceding species.)

Male:—Not known.

Described from seven female specimens captured from the foliage of bastard gum in a forest near Nelson, N.Q., October 26, 1911, (1 ♀), November 30, 1911 (5 ♀'s); and from the window of a barn at Roma, Queensland, October 6, 1911 (1 ♀). Dedicated to Andreas Vesalius, one of the earliest men of the present civilisation to assert the right of free thought and independent mentality.

Subsequently, a female from a window at Nelson, April 21, 1912.

Habitat: Australia—Roma and Nelson near Cairns, Queensland.

Type: No. Hy/1060, Queensland Museum, Brisbane, one female in xylo-balsam (Nelson, November 30; mounted with a pair of *S. lavoisieri* and *S. cuvieri* and *Oligosita minima* Girault, 1 ♂, 1 ♀). This species may be *cuvieri*, large individuals.

6. STETHYNIUM PEREGRINUM Girault.

Girault, 1911 d, pp. 120-123. Perth, West Australia.

DIAGNOSTIC ARRANGEMENT OF THE AUSTRALIAN SPECIES OF *STETHYNIUM* ENOCK.

FEMALES.

A. Species all yellowish, the wings hyaline or at least not distinctly infuscated; the mesosecutellum bearing median and lateral sulci.

I. Fore wings narrow, their longest marginal cilia distinctly longer than their greatest width. Minute.

Fore wings at the most with about ten longitudinal lines of discal cilia; joints 2, 4 and 6 of antennal funicle longest, longer than wide, the other joints subquadrate, or only slightly longer than wide, all the funicle joints short; distal club joint forming nearly half of the club. Legs and antennæ wholly concolorous with the body *cuvieri* Girault.

- II. Fore wings moderate to broad, their longest marginal cilia distinctly shorter than their greatest width or may be subequal. Species moderate in size to moderately large.
1. Posterior wings normal. Second funicle joint as long or longer than the pedicel.
 - a. Proximal funicle joints of antenna moderately long, the second joint much longer than the pedicel and plainly four times longer than wide. Distal four joints of funicle and whole of the club sooty black; distal tarsal joints concolorous with the legs; funicle joint 5 twice the size of joint 6 which is shorter than proximal funicle joint *mayeri* Girault.
 - b. Proximal funicle joints of antenna short, the second joint subequal in length to the pedicel and only about twice longer than wide. All of funicle joints and whole of the club sooty black; distal tarsal joints black; funicle joint 5 smaller than joint 6 of the funicle which is nearly as long as joint 1 and distinctly broader *daltoni* Girault.
 2. Posterior wings broader and unusually white, more or less abnormally broad; second funicle joint distinctly shorter than the pedicel.

Fore wings broad, bearing about seventeen lines of discal cilia at their widest portion; posterior wings broad and colorless, apparently without discal ciliation and immargined, the marginal cilia long. Dusky yellowish, the legs very pallid, the antennæ yellowish. Joints of funicle all subglobular *lavoisieri* Girault.

Fore wings not so broad, bearing only about twelve or fourteen longitudinal lines of discal cilia; posterior wings slightly broader than usual, colourless. Bright lemon-yellow *vesalii* Girault.
- B. Species Indian red, the fore wings more or less fumated under the venation and broad, bearing from thirty to thirty-five lines of discal cilia; sulci of thorax absent; posterior wings very broad, their posterior marginal cilia longer than those of the fore wing; second funicle joint only a third longer than wide *peregrinum* Girault.

TRIBE MYMARINI.

GENUS MYMAR Haliday.

All in normal position.

1. MYMAR SCHWANNI new species.

Female:—Length, 0·70 mm. Visible to naked eye but not easily though not small.

General color brown, the distal third of the abdomen dusky black or fuscous, the vertexal carina and eyes dark; abdominal petiole, distal two funicle joints, coxæ and femora lighter, with some yellowish, nearly pallid yellowish; scape, pedicel, the tibiæ and tarsi concolorous with the body; distal tarsal joints,

first four funicle joints and antennal club sooty black; petiole of fore wings and somewhat over the distal half of the wing blade dark sooty black, the remaining portion of the blade hyaline. The fuscation of the fore wings is intense.

This species as compared with a specimen of *Mymar pulchellum* Curtis, differs as follows: In general appearance, coloration and so forth casually the same. The details of coloration differ—the fourth funicle joint in *schwanni* is black, yellowish in *pulchellum*; in the former, the scape, pedicel, the tibiae and tarsi are darker than in the English species which has the legs of uniform color; the petiole of the fore wing and the vestigial posterior wing are darker in *schwanni* and the fuscation of the fore wing more intensely black. Structurally, in the antennae, which are very similar, the distal funicle joint in the Australian species is slightly shorter in relation to that in the preceding species and all of the funicle joints distad of the long second joint are somewhat longer, the two distal joints more nearly equal than in *pulchellum*. The fore wings of *schwanni* differ in that they are distinctly broader (at least by a third) and bear a higher number of primary marginal cilia (35 to 36; only from 28 to 30 in *pulchellum*); the discal ciliation is about the same yet somewhat coarser while the marginal cilia are somewhat longer (it is hairlike). The posterior wings in both species are about the same shape and size and in all other respects the two species appear to be the same. From the American species, *venustum* Girault, *schwanni* differs in bearing several more primary marginal cilia (only about 34 in *venustum*), the central line of discal cilia extends to the wing apex (here proximad, the acute part of the blade), the clouded portion of the fore wing is much darker and more intense and in details of coloration, especially as concerns the antennae which in *venustum* are uniformly colored, not black, brown and yellow as in this Australian species. In this connection it should be stated that the antenna of the male of *pulchellum* is also uniformly concolorous with the body, not yellow and black as in the female.

(From one specimen, 1/6-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the panes of a window in a wool warehouse, Brisbane, Queensland, October 3, 1911. The specimen was in active movement, its wings extended vertically over it and the insect was moving along rather slowly with an actual dancing movement which made it much more conspicuous than if it had been at rest. The wings were in rapid motion. On October 5, 1911, at Roma, Queensland, several hundred miles west of Brisbane, a male *Mymar* was captured by sweeping grass along a tiny stream crossing a pasture near the town. It looked like this same species, but although the specimen was preserved, later I could not find it.

Habitat: Australia—Queensland (Brisbane and (?) Roma).

Type: No. *Hy/1061*, Queensland Museum, Brisbane, the above female in xylol-balsam.

This species is respectfully dedicated to Theodore Schwann of Berlin, who discovered the animal cell and proved it to be identical with that of plants.

It was compared with a pair of the English species *pulchellum* Curtis, labelled "*Mymar pulchellum* Curtis, ♂. ♀. Richmond, England. 10.9.10. C. Waterhouse" and sent to me by its collector who identified it.

2. MYMAR TYNDALLI new species.

Female:—Length, 0.85 mm.; moderately large for the genus.

General color dusky black, the ventral aspect of the proximal half of the abdomen, all of that portion of the thorax cephalad of the first legs, abdominal petiole, coxæ, trochanters and cephalic femora dull honey yellow; rest of the legs and all of the antennæ sooty black; eyes dark; fore wings with slightly less than a half from apex pronouncedly clouded with sooty black, the proximal margin of the clouded area in the caudal half of the wing with a distinct scoop or concavity in it; petioles of the wings proximad suffused with yellowish. Bulbs of scape yellowish.

At once distinguished from all species of the genus known to me by having the posterior wings unusually long and hairlike, reaching beyond the base (caudad) of the small blade of the fore wing. Furthermore, distinguished from the specimen of *pulchellum* mentioned above by marked differences in coloration and in bearing a somewhat broader blade of the fore wing. From *schwanni*, *tyndalli* differs more noticeably, namely in bearing a narrower and more elongate blade of the fore wing (bearing about 41 primary marginal cilia, only about 35 in *schwanni*). Otherwise, structurally the three species are surprisingly similar. The posterior wing in *tyndalli* is like that of the other species along its thicker proximal fourth (out to the hooklets), but there it nearly abruptly narrows, becoming like a very long, hairlike seta arising from the apex of the thicker proximal portion; slightly distad of its distal fourth it again perceptibly narrows, becoming like an exceedingly fine hair which is acuminate; along the caudal margin of the blade of the fore wing, the posterior wing reaches slightly beyond the second primary marginal cilium. The proximal three fourths of the posterior wing, or all of it excepting the narrowest, delicate distal fourth (or less) bears along it from each side, minute hairlike setæ as with the petiole of the fore wings. Tarsal claws and strigil present. Hooklets on posterior wings.

(From one specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen captured from the pane of a window in workmen's quarters on a sugar farm near Nelson, N.Q., January 22, 1912, in the mid-afternoon.

Habitat: Australia—Queensland (Nelson).

Type: No. *Hy/1062*, Queensland Museum, Brisbane, the above female in xylol-balsam (mounted with a female of *Anagrus armatus*).

Dedicated to John Tyndall, natural philosopher.

There is a distinct possibility that the posterior wings in all species of *Mymar* are like those of *tyndalli*, the setiform portion having become broken off in the specimen described, as appears so likely to happen from its appearance. If this is so, coloration and the general characters of the blade of the fore wing appear to be the only details in which the species differ. Those species so far seen by me agree remarkably in antennal and leg structures and in the shape of the body and so on.

GENUS POLYNEMA Haliday.

All in normal position.

1. POLYNEMA REDUVIOLI Perkins.

Perkins, 1905, pp. 193, 194, 196-197, pls. XII, figs. 3 and 3a; XIII, fig. 7.

Idem, 1906, p. xxiv; 1910, p. 667.

The following comparative notes are given concerning this species:

General color black, the legs (excepting distal tarsal joints but including coxæ), the abdominal petiole and proximal three antennal joints intense orange-yellow. Wings hyaline, the venation black.

Second funicle joint somewhat diluted black.

Belonging to that group of species with the proximal funicle joint lengthened, usually with the scape asperate beneath and usually black, intensely colored with orange on the appendages and abdominal petiole. It resembles then the following species of the genus—*psecas* Girault, *enockii* Girault and *hawaiiense* Ashmead. From *psecas* and *enockii* it differs as follows: *enockii* has very much broader fore wings (only about 24 longitudinal lines in *reduviali*) with their marginal cilia shorter (the longest in *reduviali* somewhat over a third the greatest width of the wings); its proximal funicle joint is longer, subequal to joint 2, distinctly shorter but not very much so in *reduviali*; the third and fourth funicle joints are subequal in the English species, unequal and shorter in the Australian one; in the latter also the proximal funicle joint is only a fourth longer than joint 3, while in *enockii* it is a third longer. The two species

are readily distinguished, especially because of the differences in the width of the fore wings. From the American species *psecas* it differs only about as much as it does from *enockii*, both the American and English forms being closely related (but see later). From *hawaiiense*, apparently, it may be distinguished by its shorter proximal and third funicle joints of the antennæ. With the exceptions noted the species resembles *enockii* and elsewhere I have pointed out how closely allied it is to the North American *psecas*. Scape asperate along its ventral margin and with a very distinct scaly sculpture; pedicel oval, slightly over half the length of the first funicle joint; marginal vein of fore wing narrow. Posterior wing bearing a paired line of discal ciliation along each margin but apparently with no midlongitudinal short line running from the apex. Marginal cilia of the fore wing along the cephalic margin not half the length of the longest marginal cilia (caudo-distad). Longest marginal cilia of caudal wing about three fourths the length of the longest cilia of the fore wing. Discal ciliation of the fore wing dense and fine.

(From 1 specimen, 1-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—I have noted the male elsewhere while Perkins described it in the original description of the species.

Redescribed from a single female specimen captured by myself November 4, 1911, from the window of a veranda in a private residence, Kuranda, Queensland.

Habitat: Australia—Queensland (Kuranda). Sandwich Islands.

I have since been able to compare this species with authentic specimens of *psecas* (Girault) and find the following differences: The second funicle joint in *psecas* may be nearly as yellow as the first, not merely dilute black; the proximal funicle joint is distinctly longer, thus it is slightly longer than the second, the first, second and third joints each shortening; the fore wings appear to be somewhat broader yet the two species are very similar in this respect. They must be separated on antennal structure. A recomparison of specimens of the British (*enockii*) and American (*psecas*) forms still induces me to consider them distinct; thus, as regards the length of the proximal funicle joint of the antenna, *psecas* comes first with that joint slightly though distinctly longer than the second, then *enockii* with the first slightly shorter than the second and then finally this Australian species (*reduviali*) with the first joint distinctly shorter than the second. This structure of the first funicle joint of the antenna in *reduviali* reveals another gradation between the short and usual proximal funicle joint and the long joint and strengthens the argument concerning the identity of *Stephanodes* Enoch with *Polynema* Haliday. Still another link in the gradation is the next species.

2. POLYNEMA SPENCERI new species.

Female:—Length, 0.77 mm.

Black, with the abdomen brownish black, the antennal pedicel, the scape to a less extent, the first funicle joint, the knees, cephalic tibiae, most of the intermediate and posterior tibiae excepting a band in the middle and the tarsi except distal joint, pallid yellow, the antennal funicle beyond the first joint brownish yellow or dusky, the solid club black; remaining portion of the legs concolorous with the abdomen. Abdominal petiole pallid yellow. Wings perfectly clear, transparent.

Differs from the preceding species in having narrower fore wings which bear finer and shorter discal ciliation (16 lines), the ciliation disappearing proximad and not dense; the color of the appendages is duller, the antennal joints are shorter, the second joint for instance distinctly not twice the length of the pedicel, the first joint, however, lengthened so as to be longer than the pedicel or subequal to it and at least two thirds the length of the second and longest funicle joint. Thus, in relation to the second joint, the first appears to be lengthened as in *psecas* but in reality it is no longer than the same joint in *consobrinus*. The longest marginal cilia of the fore wing (disto-caudad) are about two thirds or not quite, the greatest width of those wings. The cilia are longer cephalo-distad and caudo-distad than at the apex. Posterior wings narrow, their caudal marginal cilia nearly as long as the longest marginal cilia of the fore wings; they bear 2 lines of discal cilia, one along each margin, the cilia in each line not close together; apparently neither line is paired. Fore wings in discal ciliation doubtless resembling somewhat the North American *piceipes* Girault.

Antennae normal for the genus, none of the nine joints long; first funicle joint somewhat lengthened for the genus; second funicle joint longest of the funicle, one and a half times longer than the pedicel, only slightly longer than the third, which is distinctly longer than the first; funicle widening after joint 3; joint 4 short, oval, slightly shorter than 1, joint 5 only slightly shorter than 4; the distal funicle joint still very slightly shorter and broader, the shortest joint. The club large but not long.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured at Cooktown, N.Q., February 3, 1912 from the panes of a window in an unoccupied dwelling. Respectfully dedicated to Herbert Spencer, great philosopher and forceful exponent of reason as based on experience.

Habitat: Australia—Queensland (Cooktown).

Type: No. *Hy/1070*, Queensland Museum, Brisbane, the above specimen in xylol-balsam (mounted with specimens of *Trichogramma*, type *Paratrichogramma* and *Oligosita*).

3. POLYNEMA DRAPERI new species.

Male:—Length, 0.70 mm.; moderately small for the genus.

Black, the antennal scape and pedicel, the abdominal petiole and the legs excepting distal tarsal joints and the intermediate and caudal femora and tibiae (which are suffused with dusky) pale orange yellow. Wings uniformly subhyaline.

Somewhat like the North American species *longipes* (Ashmead), the fore wings narrow, with only about from eleven to twelve lines of discal ciliation across the widest portion of the blade, the longest marginal cilia about a fourth longer than the greatest width. Though of the general type of *longipes*, the fore wings are much broader than in that species, their discal ciliation fine, shorter and more dense. But they are shaped in general like those of *longipes*, being elliptical and obtusely pointed at apex, shaped somewhat like a torpedo. Caudal wings very narrow. Parapsidal furrows complete. Proximal tarsal joints long and slender, subequal to the next two joints combined or slightly longer. Antennae 13-jointed, normal, longitudinally striated on the funicle, the first funicle joint about twice the length of the pedicel, the joints shortening distad; funicle joints 1-4 subequal, long and slender, a third or fourth longer than the club joint which is long-elliptical and four times longer than its greatest width; funicles 5-6 slightly shorter than 4; 7-10 subequal and shorter, 10 only slightly longer than the club joint.

(From one specimen, the same magnification.)

Female:—Not known.

Described from a single male specimen captured by sweeping grass in a field near Cooktown, N.Q., February 27, 1912. Captured with specimens of the trichogrammatid *Tumidiclava ciliata* Girault. Dedicated to John William Draper, the physiologist, who has shown so clearly that civilisations, societies and all human populations are as immutably ruled by natural law as is the development of the individual human or the evolution of a species of bird or plant. The works of this man are neglected by nations at their peril.

Habitat: Australia—Cooktown and Thursday Island, Queensland.

Type: No. *Hy/1069*, Queensland Museum, Brisbane, the above male in xylol-balsam (mounted with five females of *Tumidiclava ciliata* Girault).

Subsequently, another male was captured by sweeping grass on Thursday Island, Torres Strait, March 13, 1912. This had the antennal and proximal tarsal joints all somewhat relatively longer and more slender. Later still a third male was found which had been captured from the pane of a window in an unoccupied dwelling at Cooktown, January 31, 1912.

4. *POLYNEMA SIEBOLDI* new species.

The two specimens of this species were first taken to be *albicoxa* Ashmead, whose original description is not now available to me so that I am not sure that they are correctly identified. The species agrees with the Ashmeadean species; it bears the single fascia across the fore wings, the coxæ and trochanters are white, the rest of the legs lemon-yellow while the funicle distad of the proximal joint is very pale brownish, the club black, the distal funicle joint darker than the others. The distal tarsal joint is dusky; the first three joints of the antennæ are lemon-yellow, while the abdominal petiole is whitish. The band across the fore wing is subquadrate, somewhat over its own length from the marginal vein, a third nearer to the latter than to the wing apex. The scape is not sculptured or asperate; the first funicle joint is longer than the pedicel and at least thrice longer than wide, half the length of the long second joint and subequal in length to the fourth funicle joint; the third funicle joint is slightly shorter than the second and widened slightly distad. The proximal tarsal joint is very long and slender, nearly as long as the combined lengths of the other three joints. The discal cilia of the fore wing are moderately fine, arranged in about eighteen lines while the longest marginal cilia are about two thirds the greatest width of the wing. The posterior wings are dusky throughout. The ovipositor is only slightly exerted. But I must consider it distinct for the reasons given beyond.

The foregoing notes are based on a single female captured by sweeping in a jungle near canefields at Goondi (Innisfail), N.Q., July 24, 1912. Girault (1911a) records a male from Fiji but both that record and this Australian one must be under suspicion until the species *albicoxa* is better known, since I believe it was described from the West Indies.

While at first concluding that the above specimen is the same as the Fiji male identified as *albicoxa*, subsequently I found a male captured also in the jungle at Goondi, several days later. This male differs from the description of the Fiji specimen in having decidedly shorter antennal joints and this fact makes me conclude that the Australian form is a distinct species, differing colorationally in some character which cannot be made out from the descriptions. Since *albicoxa* was described, I believe, from the West Indies, the Fiji specimen is also probably distinct but for the present I leave it as identified by me in 1911. There are thus probably three species of *Polynema* bearing one-banded fore wings.

The male *sieboldi* has the antennal funicle and club black, the first funicle joint, however, whitish, the scape and pedicel lemon-yellow like the legs; the coxæ are yellow; knees of the caudal legs fuscous. The funicle joints are not quite thrice longer than wide, the somewhat shorter proximal joint of the funicle about twice the length of the spherical pedicel which is somewhat wider than long. The species is moderately small for the genus, measuring about 0.65 mm.

(From a single specimen of each sex, the same magnification.)

Habitat: Australia—Queensland (Goondi, Innisfail District).

Types: No. *Hy/1073*, Queensland Museum, Brisbane, the foregoing specimens, two slides (the ♀ mounted with the male type of *Polynema romanesi* Girault).

Polynema sieboldi is dedicated to Carl Theodore Siebold who discovered single-celled organisms.

5. POLYNEMA ROMANESI new species.

Male:—Length, 1.00 mm.

Black, the scape and pedicel of the antenna, the legs and abdominal petiole orange-yellow; distal tarsal joint black; funicle wholly black; marginal vein brownish black, the fore wings indistinctly, somewhat irregularly lightly stained. Coxæ lightly tinged with fuscous.

Different from all the preceding species but most similar to *draperi* from which it differs in having broader fore wings, longer legs and antennal joints and more intense yellow coloration. The fore wings bear about sixteen lines of moderately fine discal ciliation; the marginal cilia of the fore wing are about as long as three fourths of the greatest wing width. The fore wings are moderately slender. The longest antennal joints, joints 2-5 of the funicle, are each fully six times their greatest width. Posterior wings very narrow. Pedicel obconic.

(From one specimen, the same magnification.)

Female:—Not known.

Described from a single male specimen taken alive from a spider's web suspended between cane-plants along the edge of a canefield in jungle country, Darradgee, N.Q., July 26, 1912. Named after G. J. Romanes, one of the pioneers of animal psychology.

Habitat: Australia—Darradgee, Innisfail District, Queensland.

Type: No. *Hy/1074*, Queensland Museum, Brisbane, the forenoted male (mounted with the female type of *P. sieboldi*).

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AUSTRALIAN HYMENOPTERA CHALCIDOIDEA--III.*

The Family Elasmidæ, with Descriptions of New Species.

BY A. A. GIRAULT.

INTRODUCTION.

THE family ELASMIDÆ is a small one, consisting but of two genera. Heretofore only a single member of the family had been recorded from Australia and I have not as yet succeeded in capturing it. The species is *Euryischia lestophoni* Howard, the only representative of the second genus of the family. This genus, in my opinion, is doubtfully elasmid since I have found an encyrtid genus in Australia with elasmid wings and caudal coxæ and characters of this sort may have led Ashmead to ally the genus with the ELASMIDÆ. However, neither the insect nor its original description is accessible to me, so that I must be content to accept Ashmead's conclusion.

The types are deposited in the Queensland Museum at Brisbane.

HYMENOPTERA CHALCIDOIDEA.

FAMILY ELASMIDÆ.

GENUS ELASMUS Westwood.

All in normal position. It is not certain that both sexes of all species have been correctly paired, since coloration alone was used for that purpose.

1. ELASMUS SERENUS new species.

Female:—Length, 2.0 mm.; usual in size for the genus.

Dull honey yellow, the tibiæ, tarsi and the flagellum darker. Eyes dark red; a large black, rounded triangular area (apex caudad) on mesopleurum beneath the fore wing insertion but central (also, it is between the cephalic and

* Contribution No. 5, Entomological Laboratory, Sugar Experiment Stations, Mackay, Queensland.

intermediate coxæ but above them); base of abdomen above fuscous; exposed tips of valves of ovipositor black, a spot at base of ovipositor fuscous; dorsal edge of intermediate coxæ and the centre of the same edge in the caudal coxæ black; black spines on caudal tibiæ forming conspicuous sagittate areas, the lines crossing and recrossing; axillæ black; coxæ, femora and antennal scape lighter than the body; centre of the vertex black as is also the disk of the metathorax more obscurely; scutellum and postscutellum lemon-yellow, lighter than the dull honey-yellow of the body; occiput black; venation dull brown, the wings uniformly slightly brownish. Pronotum dark, especially at the meson cephalad.

Mesoscutum with dense black pubescence which lies close to the body, that is, it is not erect; the mesoscutellum, however, is naked with the exception of one much larger, black bristle at each corner, its surface very delicately roughened; head with black, stiff hairs and thimble punctures. Wings densely ciliate; the long, slender proximal tarsal joint slightly shorter than the combined lengths of the other three joints. Intermediate femora as much compressed as the posterior, the intermediate coxa, however, conical. Fore wings with short marginal fringes. Mesopleurum very finely lined; caudal coxæ polygonally lined. Parapsidal furrows absent. No strigil.

Antennæ 9-jointed*; 3 funicle joints, all long and slender, subequal, club 3-jointed, its basal joint longest, only slightly shorter than the distal joint of the funicle; distal club joint much shorter. The ring-joint is short.

(From a single specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Not known.

Described from a single female captured at Babinda, N.Q., by sweeping in a jungle, October 28, 1911. In the above description, mention was omitted of a small black dot just above insertion of cephalic coxa.

Habitat: Australia—Queensland (Babinda).

Type: No. Hy/1076, Queensland Museum, Brisbane, the above female mounted on a tag plus the head in xylol-balsam.

2. ELASMUS AUSTRALIENSIS new species.

Female:—Length, 2.00 mm.

Dark metallic green, the produced base of the abdomen beneath reddish, suffused with yellow; the distal half of the caudal coxæ yellowish white, the tarsi blackish or pale, the tibiæ pale, the black spines of the caudal tibiæ arranged as in the preceding species (*serenus*); antennæ black, the scape lighter; vertex

* The antennæ are most probably 10-jointed in all of the species, the first ring-joint being overlooked.

yellow, excepting laterad before reaching the eye-margin on each side; ocelli ruby-red. Wings and venation colored as in *serenus*. Eyes garnet. Color of body with much purplish reflection. Intermediate coxa black along its upper edge; legs otherwise pale yellowish. Mesoscutum and caudal coxa polygonally lined, the femora also appearing to bear minute pin-punctures; it is pubescent; apex of abdomen stiffly hairy. Abdomen conic-ovate, the ovipositor not exerted. Head with thimble-punctures.

Antennæ with the club more defined than in *serenus* where it is cylindrical; here, it is ovate; also, in this species the funicle joints are much shorter, not much longer than wide.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a single specimen captured from the pane of a window in men's lodgings on a sugar farm near Nelson (Cairns District), N.Q., December 3, 1911. The half and half coloration of the caudal coxæ, the yellowish vertex, the metallic green of the general body color reflecting purple and the reddish yellow of the ventral base of the abdomen, taken together with the antennal characters mentioned, are the characteristics of the species.

Habitat: Australia—Queensland (Nelson).

Type: No. Hy/1077, Queensland Museum, Brisbane, the forementioned specimen mounted on a tag.

3. *ELASMUS INSULARIS* new species.

Female:—Length, 2.15 mm.

Head and thorax metallic green but the face yellow ventrad of the insertion of the antennæ; abdomen reddish, black at extreme tip and just before tip crossed by a black stripe; eyes and ocelli garnet; scape, femora and tibiæ pallid yellowish, the black spines of the caudal tibiæ arranged as in the two preceding species, the coxæ also pale yellow; tarsi dusky. Antennæ dusky. Base of abdomen above black. Venation dusky. Sides of thorax just above insertion of cephalic coxa whitish. Antennæ as in *serenus* but the third funicle joint and the proximal joint of the club are shorter. Head with thimble-like punctures. Mesoscutum hairy.

(From one specimen, the same magnification.)

Male:—The same but the coloration of the abdomen is pale yellow and the head all black; the fourth funicle joint of the antennæ is very long and slender. Antennæ 10-jointed.

(From one specimen, similarly magnified.)

Described from one pair captured by sweeping in a forest on Double Island off the coast of North Queensland near Cairns (about fourteen miles north and about one mile west from the mainland), December 25, 1911. And a male captured by sweeping in a forest near Nelson, May 10, 1912. The male from Double Island had the basal half of the caudal coxæ darker.

The pedicel of male antenna is larger than the first funicle joint; the first joint of the club (male) slightly longer than the second. The rami are not jointed but only apparently so.

Habitat: Australia—Double Island and Nelson, N.Q.

Types: No. Hy/1078, Queensland Museum, Brisbane, the forementioned specimens (2 ♂, 1 ♀ on tags), plus one balsam slide bearing an antenna from each of the males.

4. ELASMUS FORMOSUS new species.

Female:—Length, 2.25 mm.

Like *serenus* but the general coloration is deeper and brighter, orange-yellow and the large black area is not present in the middle of the mesopleurum; other markings also differ. Marked with black thus: The centre of the vertex, the axillæ and tegulæ, tip of the abdomen and valves of the ovipositor, the disk of the metanotum triangularly or quadrangularly, two spots in a longitudinal line on each side of (not upon) the scutellum, margins on each side of base of abdomen (very narrowly dorsal aspect) and a minute spot at base of abdomen, centrally, dorsal aspect. Pubescence, arrangement of the black hairs on the posterior tibiæ, wings and antennæ as in *serenus*. Dorsal half of the occiput black, excepting dorso-laterad.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured the same place and date as was *insularis*.

Habitat: Australia—Queensland (Nelson, N.Q.; Double Island, off the coast).

Type: No. Hy/1079, Queensland Museum, Brisbane, the above female mounted on a cardpoint or tag.

On October 9, 1912, a second ♀ by sweeping, forest, Nelson, N.Q.; the sides of the base of the abdomen were more broadly blackened, the tip of abdomen merely fuscous; the minute spot at the centre of base of abdomen absent; the caudal of the two spots on each side of scutellum surrounds the propodeal spiracle.

5. ELASMUS AQUILA new species.

Female:—Length, 2.20 mm.

Dark metallic green with æneous tinges, the distal half of the abdomen, including the valves of the ovipositor, black, the basal half (excepting a dusky portion at extreme base in the dorsal aspect) orange-yellow; oral area whitish;

antennæ, coxæ (excepting base of cephalic and all except extreme base of caudal), femora excepting proximal half and the tibiæ pallid to pallid dusky, the tarsi dusky; black spines on caudal tibiæ arranged as in the other species. Tips of antennæ lighter. Antennæ with the funicle and club joints short but the former longer than wide while the club joints are subquadrate. Intermediate coxæ mostly black. Marginal cilia of fore wing somewhat shorter than in the preceding species. Head, vertex and mesoscutum with numerous thimble-like punctures. All of caudal femora black. Fore wings not hyaline but more or less obscurely irregularly infuscated. One or two faint dusky stripes across the abdomen just proximad of the black portion.

(From one specimen, the same magnification.)

Male:—The same but no dusky stripes on abdomen; antennæ brown-black, the fourth funicle joint long and slender; flagellum feathery. Mandibles 5-dentate, the teeth gradually smaller inwardly.

Described from a single specimen of each sex captured by sweeping within and about the edges of a jungle near Yungaburra, N.Q., December 30, 1911 (female) and by sweeping miscellaneous vegetation, west bank of the Pioneer River, Mackay, Queensland, October 19, 1911; near jungle.

Habitat: Australia—Yungaburra and Mackay, Queensland.

Types: No. *Hy/1080*, Queensland Museum, Brisbane, the above male and female mounted separately on cardpoints, plus one slide bearing the head of the male.

6. *ELASMUS VICINUS* new species.

Male:—The same as female *aquila* but much smaller, measuring in length only 1.00 mm. Also its wings are perfectly hyaline and the cephalic coxa bears more blackish. The antennæ bear a slender, conic-ovate club of which the third and distal joint is minute; the funicle is 4-jointed the first three joints small, each bearing a long, slender ramus; the fourth joint much longer, slender but comparatively short, subequal to the club; of the three ramose joints the distal is largest. The abdomen has less reddish yellow and is nearly all black.

(From a single specimen, the same magnification.)

Described from a single male specimen captured by sweeping in a jungle, Yungaburra, N.Q., December 30, 1911. Although captured with a female of *aquila* while the male of that species was captured at Mackay and in a somewhat different habitat, a mangrove swamp in a jungle, instead of a pure jungle, I believe this specimen must be distinct since it is so much smaller and has hyaline wings. It differs much in antennal structure from what I have designated as

the male of *aquila*, since the funicle above the branches consists of a single joint, which though slender is not half the length of that part of the funicle in the male of *aquila*.

Habitat: Australia—Yungaburra, Queensland.

Type: No. *Hy/1081*, Queensland Museum, Brisbane, the above specimen mounted on a tag, plus head and appendages on a slide in xylol-balsam.

7. ELASMUS CYANEICOXA new species.

Male:—The same as the female of *aquila* but the caudal and intermediate coxæ are metallic bluish, the abdomen less reddish at base, more yellowish, the dusky stripes in the colored portion absent. The three branches of the antenna are very long, many-jointed and feathery with very fine, long hairs; the funicle above the branches is very long and appears to be indistinctly divided into several unequal joints, some of which are slender and much longer than the others. The fore wings are less infuscated. The antennal club is 3-jointed, the basal joint long, a third longer than the second joint, the distal joint a mere spur. Mandibles 6-dentate.

(From one specimen, the same magnification.)

Female:—Not known.

Described from a male captured at dusk by sweeping grass in a forest at Nelson, April 10, 1912.

Habitat: Australia—Nelson, N.Q.

Type: No. *Hy/1082*, Queensland Museum, Brisbane, the above specimen plus the head on a slide.

8. ELASMUS IMPUDENS new species.

Male:—Length, 1.70 mm.

Metallic green, very dark, the abdomen near base, narrowly, with a faint transverse band of orange; tarsi and antennæ brownish, the antennal club, the coxæ, the femora and much of all tibiæ black; scape and pedicel black or dusky; wings hyaline. Distal tarsal joints darker. Caudal femora longitudinally ribbed. Head and mesoscutum with thimble-punctures. Cephalic tarsi paler; antennal funicle with a long fourth joint but which is not as long as that in *aquila*. Otherwise as in preceding species. Scutellum naked, finely polygonally lined.

(From one specimen, the same magnification.)

Female:—Not known.

Described from one male captured by sweeping the forested top of the hills near the coast, mainland, Double Island (near Cairns), N.Q., Australia, December 24, 1912. Characterised by the nearly wholly dark body.

Habitat: Australia—Double Island, Queensland.

Type: No. *Hy/1083*, Queensland Museum, Brisbane, the above male specimen mounted on a tag.

9. ELASMUS MINOR new species.

Male:—Length, 0·60 mm.; small for the genus.

The same as *vicinus* but the legs are all pale except the proximal half of the caudal coxa, the body is much smaller, the proximal half of the abdomen pale yellowish. Legs and antennæ yellowish. Wings hyaline. The fourth joint of the antennal funicle is longer and more slender than in *vicinus* while at the same time the proximal club joint is longer, the two proximal joints of the club less equal than with *vicinus*. Otherwise as in preceding species.

(From a single specimen, similarly magnified.)

Female:—Not known.

Described from a single male captured by sweeping miscellaneous vegetation in a jungle growth along the west bank of the Pioneer River, Mackay, Queensland, October 19, 1911.

Habitat: Australia—Mackay, Queensland.

Type: No. *Hy/1084*, Queensland Museum, Brisbane, the above-mentioned specimen, mounted on a slide in xylol-balsam.

10. ELASMUS NIGRISCUTELLUM new species.

Female:—Length, 2·25 mm.

Ochreous yellow or yellow with a reddish tinge, the vertex, face, mesopostscutellum and the posterior border of the mesoscutum, rather broadly, contrasting bright lemon-yellow. Marked with black with a purplish lustre as follows: The mesoscutellum and axillæ, a large rounded spot in the mesopleurum under the insertion of the fore wing, the centre of the vertex, the central black area, connecting broadly posteriorly with the occiput and narrowly laterally with each eye-margin, the disk of the metanotum, the base of the tegulæ, a spot at base of abdomen in the middle and a transverse spot on each side of it; the dorsal edge of posterior coxa, the cephalic half of the occiput, the antennæ, except

the pale yellow scape and the tarsi. Legs pallid yellow, the caudal tibiae with the usual arrangement of the black spines. Tip of abdomen black, including the valves of the ovipositor. Head with thimble-punctures, the vertex also finely, transversely lined; ocelli within the black central spot of vertex. First funicle joint much longer than pedicel, the second and third joints subequal, each slightly shorter than the first, the basal club joint the longest of the joints of the club. Otherwise as in *formosus*.

(From one specimen, similarly magnified.)

Male:—Not known.

Described from a single female specimen captured by sweeping miscellaneous trees, bushes and grasses on the forest-downs near Hughenden, Queensland, July 14, 1912.

Habitat: Australia—Hughenden, Queensland.

Type: None. The specimen was accidentally lost just after describing it.

11. *ELASMUS SPECIOSISSIMUS* new species.

Female:—Length, 2.23 mm.

Like *nigriscutellum* but the black markings more or less suffused with metallic greenish and differing in pattern as follows: The central black area of the vertex does not extend laterad narrowly to the eye-margins but its lateral margins are straight or nearly; the pronotum is lemon-yellow (besides the vertex, head, scutellum and portions of the scutum) excepting in a rounded area at cephalic margin in the median line; the broad caudal lemon-yellow border of the mesoscutum is emarginate, extends more narrowly also up the lateral margins, the posterior portion penetrating the metallic greenish black of the disk on each side of the meson in the shape of a broad, acute tooth; consequently, the blackish portion descends caudad along the meson in the shape of a blunt cone; the two areas have the appearance of being mortised into each other. The base of the abdomen is crossed dorsad by a moderately broad, continuous, metallic green stripe while the tip of the abdomen is black for a distance equal to a fourth, or nearly, of the abdomen's length, the blackness divided by a narrow transverse stripe of orange-yellow. Moreover, the black area in the centre of the mesopleurum is not isolated but continuous with the greenish black of the scutellum and involves a portion of the base of the enormous caudal coxæ. The legs are pallid yellowish with the black spines of the caudal tibia arranged as in the other species. Scape lemon-yellow, the rest of the antenna black. Dorsal half of

occiput black, except where invaded by the yellow of the vertex. Third funicle joint somewhat shorter than the second which is a fourth shorter than the long first joint. Head and thorax with umbilicate punctures. Wings more or less slightly infuscated. Eyes ovate, garnet.

(From one specimen, similarly magnified.)

Male:—Not known.

Described from a single female captured August 16, 1912, by sweeping foliage and grass in a forest, Nelson, N.Q.

Habitat: Queensland, Australia (Nelson near Cairns).

Type: No. *Hy/1168*, Queensland Museum, Brisbane, the above specimen, tagmounted (abdomen only; plus head in xylol-balsam).

12. ELASMUS SPLENDIDUS new species.

Female:—Length, 2·00 mm.

Dark metallic green, the abdomen in general yellowish. The abdomen, except disto-ventrad before tip where it is suffused with ochreous or reddish and excepting the black markings mentioned later, the ventral third of the occiput, an obliqued subquadrate spot on the occipital margin of the vertex, laterad against each eye, one of its corners entering the metallic green occiput, the caudal coxa for the most part (but less bright), the entire face ventrad of the vertex, the antennal scape, the shoulder or the cephalo-lateral angle of the pronotum, the centre of the mesopostscutellum transversely and the middle of the lateral margins of the scutellum narrowly,* bright lemon-yellow; femora and tibiæ pallid yellowish, the tarsus black in all the legs. Antennæ, base of abdomen broadly, tip of abdomen and ovipositor black; (dorsal aspect) three rectangular (wider than long) brown-black spots on each side of the abdomen, forming a rectangle (longer than wide) in the middle of the dorsal aspect (proximo-distad), the spots at each edge, the caudal pair nearer to the blackness of the abdomen's base. Scrobes of antennæ (ventro-cephalic aspect) forming a triangle with bevelled sides, the antennæ inserted about in the middle of the face. Distal half of dorsal edge of posterior coxa black. Eyes garnet. Tegula pallid. Vertex with umbilicate punctures; mesoscutum densely hairy; scutellum polished but rather densely

* Also apparently extending caudad around the margin from both sides obscurely.

polygonally reticulated, its margin rimmed obtusely. Upper edge of posterior femur blackish. Venation pallid dusky, the wings hyaline, densely ciliated. Funicle joints all very much longer than the pedicel, the first joint longest of the flagellum, joints 2 and 3 subequal, each somewhat shorter than 1; club shorter than funicle, 3-jointed, its proximal joints longest; 2 ring-joints. Black spines of posterior tibiae as in the other species.

(From a single specimen, similarly magnified.)

Male:—Not known.

Described from a single female specimen, captured August 25, 1912 at Nelson, N.Q., by sweeping foliage and grasses in adjoining forest.

Habitat: Australia—Nelson (Cairns), N.Q.

Type: No. *Hy/1164*, Queensland Museum, Brisbane, the above-described female, cardmounted plus the head in xylol-balsam.

The first of the two ring-joints in this species is very short and thin but its presence appears not to be exceptional within the genus.

13. *ELASMUS CYANEUS* new species.

Female:—Length, 1.85 mm.

Whole body dark metallic blue, only the scape, knees and cephalic tibiae whitish; hence differing from all of the preceding twelve species in lacking any yellowish coloration on the head, thorax or abdomen and also in being metallic blue instead of metallic green, most of the legs colored like the body. Three basal joints of cephalic tarsus and funicle of antenna pallid suffused with dusky, the antennal club darker. Wings hyaline. Vertex and mesoscutum with umbilicate punctures, the latter densely hairy (the hairs black), the scutellum naked, finely polygonally reticulated as is also the metanotum. Distal abdominal segments similarly reticulated, the large basal segment smooth, about twice the length of the following segments. Black spines of posterior tibiae obscure. Funicle joints cylindrical ovate, subequal, stouter but not much longer than the pedicel, the club wider than the funicle, ovate, its basal joint forming nearly half. Antennae 10-jointed, there being two ring-joints the first of which is concealed and very thin and short. Mandibles 5-dentate, the two innermost (mesal) teeth minute, the two lateral ones acute and subequal. Club of antenna about as long as the distal two funicle joints.

(From one specimen, similarly magnified.)

Male:—The same but a half smaller; fourth funicle joint subequal to the club, the rami extending only to basal club joint.

Described from a single female specimen captured at the same time and place as was the species *splendidus*. Also a male in a similar situation, October 9, 1912.

Habitat: Australia—Nelson (Cairns), N.Q.

Types: No. *Hy/1165*, Queensland Museum, Brisbane, the foredescribed female on a cardmount plus the head, its appendages and anterior legs in xylol-balsam, one slide; the above male on a slide.

14. ELASMUS FLAVIPOSTSCUTELLUM new species.

Female:—Length, 1.75 mm.

Somewhat like *insularis*, from which it may be distinguished at once by reason of the fact that the postscutellum of the thorax is lemon-yellow; also the head and thorax are wholly deep metallic green. Scape and legs pallid yellowish, the tarsi dark, the proximal half or less of the posterior femur metallic green. Base of abdomen rather broadly metallic greenish followed by a long intermediate portion which is orange yellowish and then a black distal portion about equal in length to the orange-yellow portion. Wings hyaline, their tegulæ concolorous with the body. Antennæ brownish. Black hairs on posterior tibiæ as in *insularis*. Occiput dark metallic green. Head and scutum with umbilicate punctures. Mandibles 6-dentate, the two outer teeth large, subequal, the other four much smaller, gradatingly smaller mesad but all distinct.

Antennæ 10-jointed, the first ring-joint concealed. Funicle 1 somewhat longer than 2 which is subequal to 3 or slightly longer; funicle 1 short, one and a half, or more or less, times longer than wide, the longest joint of the flagellum but not much longer than the two basal club joints which are subequal and each only slightly shorter than either of the distal two funicle joints, each about subequal in length to the pedicel.

(From a single specimen, similarly magnified.)

Male:—(See beyond.)

Described from a single female captured by sweeping foliage and grass in a forest, Nelson, N.Q., August 27, 1912.

Habitat: Australia—Nelson and Quingilli (Cairns), N.Q.

Types: No. *Hy/1166*, Queensland Museum, Brisbane, the above female mounted on a cardpoint plus the head and its appendages on a slide in xylol-balsam. And two headless males on a single card, with mounted head in balsam. Two cardmounts, two slides.

Later, in a forest at Quingilli, I captured the male, which is described herewith.

Male:—Like *cyaneicoxa* but the scape is dark only at the tip, the fourth funicle joint shorter in relation to the length of the club, the abdomen with a silvery white stripe across it along the distal half of the proximal half, the stripe separated from the base of the abdomen by a concolorous area equal to half of its width and the mandibles are but 5-dentate. General color metallic purple, the legs pallid excepting the black tarsi and the metallic greenish proximal half of the caudal coxa; base of abdomen metallic green. Antennæ black excepting as noted. Intermediate coxa and base of cephalic coxæ metallic purplish. Post-scutellum lemon-yellow, more plainly so at base. Length, 1.30 mm. September 13, 1912.

(From three specimens, the same magnification.)

15. **ELASMUS QUINGILLIENSIS** new species.

Female:—Length, 2.10 mm.

Like *serenus* but the spot on the mesopleurum is farther ventrad and connected more or less obscurely with the black tegula along the suture separating the two sclerites of the mesopleurum; the black spot in the centre of the vertex is metallic greenish and wider leaving less yellow between it and the eye-margin; there is a continuous, transverse stripe of black across the cephalic margin of the scutellum, moderate in width, not thin and suture-like; and more blackish on the pronotum and at base of abdomen where there is a moderately broad black stripe which is continuous. Abdomen orange reddish, the head and thorax pallid lemon-yellow, the legs paler; tarsi black. Pronotum metallic greenish black, excepting at caudal mesial margin and the caudo-lateral halves on each side. Axillæ and tegulæ black. Face yellow. Antennæ black, excepting the scape. Tip of postscutellum black, the segment margined on each side of itself, in the propodeum, by black which forms a V-shaped black marking on the metathorax or propodeum. Tip of valves of the ovipositor, but not of the abdomen, black. Mesial portion of scutum triangularly and of the scutellum, suffused more or less with ochreous, on the scutellum forming oblique lines of lemon-yellow like parapsidal grooves and a more or less distinct rounded spot at the middle of each side. Caudal coxæ and the femora blackish along the upper margin. Otherwise as in *serenus*. The ochreous area in the scutum is long and wedge-shaped, its apex at the caudal margin or near it.

(From one specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen captured by sweeping foliage and grass in a forest near Quingilli, N.Q., September 13, 1912.

Habitat: Australia—Quingilli on the Mulgrave River, Queensland.

Type: No. Hy/1167, Queensland Museum, Brisbane, the foregoing female on a card.

TABLE TO THE SPECIES OF *ELASMUS* WESTWOOD—AUSTRALIA.

MALES AND FEMALES.

1. Major color yellow or orange-yellow, without metallic coloration but marked with more or less lustrous black.
- (a.) Mesopleurum with a large, isolated, black area under insertion of fore wing.
- Body dull honey-yellow, the axillæ black; abdomen fuscous above at base; the large central black area of vertex reaching occipital margin but laterad with nearly straight margins; flagellum and tarsi dusky; tips of valves of ovipositor black; disk of metanotum obscurely black; scutellum and post-scutellum lemon-yellow. Occiput black *serenus* Girault.
- Body reddish yellow, the axillæ and scutellum purplish black; base of abdomen with a central black spot and a transverse spot on each side of the latter; tip of abdomen black; the central area of vertex with its lateral margins extended to the eye-margin and sloping caudad to occiput margin; post-scutellum, head and posterior border of scutum lemon-yellow; disk of metanotum black *nigriscutellum* Girault.
- (b.) Mesopleurum without a large isolated black area under insertion of fore wing.
- Body orange-yellow; tip of abdomen black and the tegulae and axillæ, also the disk of the metanotum, two spots in a longitudinal line on each side of the scutellum, lateral margins of abdomen very narrowly and a minute spot in centre of abdomen at base *formosus* Girault.
2. Major color the same but marked with more or less metallic coloration.
- Like the preceding two species but differing in color pattern. Central area of vertex with straight lateral margins; pronotum lemon-yellow but with a large round metallic area cephalad at the meson. Mesoscutum with its lateral and caudal margins lemon-yellow, the metallic greenish black of the disk descending caudad at meson like a blunt cone. Base of abdomen with a metallic green stripe; tip of abdomen dark; dark area in centre of mesopleurum not isolated *speciosissimus* Girault.
- The same but like *serenus*, only the central area of vertex is metallic green and wider, the spot on mesopleurum narrowly connected with the tegula; axillæ and tegulae black; see description *quingilliensis* Girault.
3. Major color metallic green or purple, marked with yellow or orange and black.
- (a.) Centre of the vertex yellow.
- Dark metallic green; produced venter of abdomen near base reddish suffused with orange; basal half of caudal coxa metallic; legs nearly all pale yellow, the tarsi dark. Antennæ mostly all black *australiensis* Girault.

- (b.) Occipital angles of vertex lemon-yellow on each side.
 Abdomen yellowish except broadly at base and tip, where it is black and also excepting three rectangular black spots on each side in the dorsal aspect; ventral third of occiput, face, scape, shoulders, lateral and caudal margins of scutellum lemon-yellow. Tegula pallid *splendidus* Girault.
- (c.) Vertex wholly black.
- (1.) Legs nearly all pallid yellow, excepting coxæ and tarsi.
 Postscutellum concolorous.
 Abdomen reddish, black at tip and extreme base; face yellowish below antennæ; caudal coxa usually yellow, sometimes proximal half black; side of thorax dorsad of cephalic coxa whitish *insularis* Girault.
 Abdomen at distal half black, reddish proximal half; proximal half of femora black or nearly; wings more or less dusky; funicle 4 in male much longer than the club *aquila* Girault.
 Same, but smaller, the wings hyaline; funicle 4 in male short, subequal to club; abdomen nearly all black *vicinus* Girault.
 Same as *aquila* but the coxæ all metallic blue *cyaneicoxa* Girault.
 Abdomen with proximal half pale yellow, distal half dark; only the proximal half of caudal coxa dark; very small *minor* Girault.
 Postscutellum lemon-yellow.
 Abdomen with base broadly metallic greenish, followed by a long intermediate portion which is orange yellowish and then a black distal portion about equal in length to the orange-yellow portion. Tegulae concolorous. Proximal half or less of posterior femur metallic greenish *flavipostscutellum* Girault.
- (2.) Legs nearly all dark except tips of tibiae.
 Dark metallic green, the abdomen with a narrow orange band around its base; tarsi and funicle brownish; scape and pedicel black *impudens* Girault.
4. Entire color dark metallic blue.
 Scape, knees and cephalic tibiae whitish, the rest of the legs concolorous with the body; funicle joints cylindrical ovate and subequal; proximal club joint forming nearly half of the club *cyaneus* Girault.

GENUS EURYISCHIA Howard.

1. EURYISCHIA LESTOPHONI Howard.

I have expressed an opinion concerning the systematic position of this species in the introduction. De Dalla Torre places the genus under his Chalcidarum Genera Sedis Incertæ and gives the rynchophorous *Lestophonus iceryæ* as host (the *Lestophonus* is a dipteran). Since the parasite is connected with the economic *Icerya purchasi* Maskell, it most probably occurs in California and perhaps parts of Africa. In Australia it occurs in Victoria at least.

ARANEIDÆ FROM THE BLACKALL RANGES.

BY W. J. RAINBOW, F.L.S., F.E.S.,
Entomologist to the Australian Museum, Sydney.

(Figs. 1-16.)

THE following is a list of Spiders, comprising a small collection, from the Blackall Ranges. Most of the species are well-known Eastern coastal forms, whilst six appear to be new, and are herewith described and figured. The most remarkable feature in connection with this collection is the predominance of immature forms. Doubtless the collector (Mr. Wild) who took them was in quest of other fry, and secured just such specimens as came his way as the result of the shaking or beating of bushes. I am indebted to Dr. R. Hamlyn-Harris, F.R.M.S., &c., Director of the Queensland Museum, for the privilege of working out this collection.

FAM. ULOBORIDÆ.

GENUS ULOBORUS, Latr.

ULOBORUS VARIABILIS, Keys ?

An immature example. A common species, both in Queensland and N. S. Wales.

FAM. DRASSIDÆ.

SUBFAM. HEMICLŒNIÆ.

GENUS HEMICLŒA, Thor.

HEMICLŒA SUNDEVALLI, Thor.

Also immature. Common in N. S. Wales and Queensland.

HEMICLŒA LIMBATA, L. Koch.

Same range as foregoing.

SUBFAM. DRASSODINÆ.

GENUS ECHEMUS, Simon.

ECHEMUS? GRISEUS, L. Koch = *Drassus griseus*, L. Koch.

Some doubt exists as to whether this species, which was vaguely recorded by its author from "Neuholland," should be included in Simon's genus *Echemus*, or whether it should, with *E. ? dilutus*, L. Koch, be assigned to a new genus. Walckenaër's old genus *Drassus* was sunk by Simon as a synonym of *Gnaphosa*, Latr., the latter enjoying priority by one year. (See Simon's Hist. Nat. des Araignées, vol. I., p. 367 (footnote); also, *op. cit.*, p. 383, for synonymy.) The species *D. ochropus*, L. Koch, noted by Simon in the footnote referred to above as an Australian species, is a New Zealand form.

FAM. ZODARIIDÆ.

SUBFAM. CRYPTOTHELINÆ.

GENUS CRYPTOTHELE, L. Koch.

CRYPTOTHELE DOREYANA, Simon.

The author of this species, in his *Hist. Nat. des Araignées*, vol. I., p. 423, defines the range of *Cryptothele* as—"Ins. Seychellæ (*Alluaudi*, E. Sim.); ins. Taprobanæ; penins. Malayana; Nova-Guinea; ins. Latronum (*Marchei*, E. Sim.); ins. Viti et Samoa." The New Guinea form is *C. doreyana*. In 1904, in *Rec. Aust. Mus.*, vol. v., No. 5, p. 322, I recorded this species from Fitzroy Island, N. Queensland. Among the spiders from the Blackall Ranges submitted to me, there is one immature specimen. This species, *C. doreyana*, was originally recorded from Dorey, New Guinea, but it has since been collected, not only on more or less fertile islands in the Great Barrier Reef (Palm Island, for example), but also, as already quoted, from Fitzroy Island, off the Queensland coast. It is only reasonable, therefore, to expect its occurrence on the mainland.

SUBFAM. ZODARIINÆ.

GENUS STORENA, Walck. = *Habronestes*, L. Koch.

Up to the present time twenty-four species of *Storena* have been recorded as occurring in Australia. Of these one (*S. flavipedes*, Urquh.) appears to be exclusively Tasmanian. To this list must now be added another species from the Blackall Ranges, and for which I propose the name *S. variipes*, in reference to the colouration of the animal's legs.

In speaking of this genus, Simon says:—

"Le genre *Storena* est l'un des plus polymorphes qui existe; le groupement des yeux y varie, dans d'assez larges limites, d'espèce à espèce, sans que ces différences soient corroborées par d'autres caractères; les quatre yeux du second rang (médiens antérieurs et latéraux postérieurs) sont en ligne droite chez les *S. formosa* Th., *spirafera*, *annulipes*, *Graffi* L. Koch, *Polli* E. Sim., en ligne plus ou courbée en avant (*recurva*) chez *S. braccata*, *picta*, *striatipes*, *scenica* L. Koch, *islamita*, *senegalensis* E. Sim.; elle est, au contraire, arquée en arrière, chez *S. maculata* Cambridge." (*Vide* Simon's *Hist. Nat. des Araignées*, vol. I., 1892, p. 427.)

Again, *op. cit.*, p. 429, in defining the relative lengths of legs of spiders in this genus, Simon says:—"Pedes (IV, I, II, III, vel IV, I, III, II, vel IV, II, III, I) robusti."

STORENA STRIATIPES, L. Koch.

Several specimens of this variable species were collected. *S. striatipes* has been recorded from Queensland, N. S. Wales, and Victoria.

STORENA VARIEPES, sp. nov.

(Figs. 1, 2.)

♀ Cephalothorax, 3·2 mm. long, 2 mm. broad ; abdomen, 3·8 mm. long, 2·3 mm. broad.

Cephalothorax.—Obovate, black, shining. *Pars cephalica* strongly arched, obtuse in front, clothed with short hoary hairs. *Clypeus* broad, deep, and clothed with long, strong bristles. *Pars thoracica* arched ; thoracic segmental groove distinct, radial grooves indistinct ; median groove or depression distinct ; a broad band of silvery hairs runs along each side of cephalothorax, and terminates near posterior coxa ; there are also present a few scattered hoary hairs over the surface of the thoracic segment. *Marginal band* narrow.

Eyes.—Eight, distributed in two rows of four each ; the posterior series are by far the largest, and form a long and strongly procurved row ; of this row, the median pair are separated from each other by a space equal to once their individual diameter, whilst each lateral eye is separated from its median neighbour by a space equal to about three-fourths its own diameter ; the anterior row of eyes covers a much smaller area than the posterior, and is strongly recurved ; the median eyes are separated from each other by a space equal to rather more than once their individual diameter, and each lateral eye from its median neighbour by a space equal to about three-fourths its own diameter ; each posterior median eye is separated from its anterior median neighbour by a space equal to fully twice the diameter of one of the former eyes, while the posterior lateral eyes are each removed from their anterior lateral neighbours by a space equal to rather more than the diameter of one of the latter. (Fig. 1.)



FIG. 1.

Legs.—Robust ; relative lengths : 4, 1, 2, 3. Of the first pair the coxæ are black ; trochanters black for about one-third their length, thence yellow ; patellæ, tibiæ, metatarsi, and tarsi yellow. Of the second pair the coxæ are black, the trochanters black on the under-side and inner angle, whilst the upper side and outer angle are blackish-yellow ; patellæ, tibiæ, metatarsi, and tarsi yellow. The third and fourth pairs are entirely black. All the legs are clothed with grey hairs and armed with spines.

Palpi.—Long, tapering, black, similar in colour and armature to legs.

Falces.—Slightly produced, strongly arched, black in front and on outer angles ; inner angles black, but yellowish at apex ; clothed with shortish hairs and long, strong bristles ; under-side and fangs dark-yellow.

Maxillæ.—Yellowish, shining, convex ; upper surface and outer angles furnished with long bristles ; inner angles thickly fringed with long, greyish hairs.

Labium.—Broader than long, arched, concolorous at apex, which is rounded off, dark at base.

Sternum.—Shield-shaped, gently arched, almost black, clothed with grey hairs.

Abdomen.—Ovate, convex, slightly overhanging base of cephalothorax, black, ornamented along each side with a series of five patches of silvery hairs; ventral surface black, densely clothed with grey hairs.

Epigynum.—A slightly elevated protuberance with two deep orifices separated from each other by an arched wall. (Fig. 2.)



FIG. 2.

FAM. THERIDIIDÆ.

GENUS ARGYRODES, Simon.

From a generic standpoint the species constituting this genus are remarkably polymorphous; so much so, indeed, that Simon (*op. cit.*, p. 503) has divided the genus into three sections, defining the limits of each. To the general and sectional diagnoses referred to, the student is directed. The species described below is an immature ♂. Probably not more than one additional moult was necessary for the animal to enter upon the adult stage.

ARGYRODES NIGRONODOSA, sp. nov.

(Figs. 3, 4.)

♂ Cephalothorax, 1·6 mm. long, 1·1 mm. wide; abdomen, 2·4 mm. long, 1·5 mm. broad.

Cephalothorax.—Ovate, attenuated in front, pale-yellow with rather dark median band extending from the ocular area to the posterior extremity. *Pars cephalica* narrow, ascending. *Clypeus* convex, but not produced. *Pars thoracica* arched; thoracic groove distinct, radial grooves indistinct; median depression distinct. *Marginal band* narrow, black.

Eyes.—Eight, of nearly equal size, the lateral pairs being somewhat the smaller, and almost contiguous. They are disposed in two rows of four each. The posterior row is nearly straight, while the anterior is strongly procurved. The median eyes of the posterior row are separated from each other by a space equal to that of fully once their individual diameter, and from their lateral neighbours by a space scarcely equal to that of half their individual diameter. The median eyes of the anterior row are separated from each other, and again from their lateral neighbours, by a space equal to about half their individual diameter.

Legs.—Long, slender, tapering, straw-yellow with dark-brown annulations, sparingly clothed with long, fine, pale hairs, and armed with rather long, slender spines. [*Note*.—Some of the latter have apparently been rubbed off.] Relative lengths: 1, 2, 4, 3.

Palpi.—Straw-yellow, moderately long, sparingly hairy. The specimen not being fully matured, the genital bulb is not uncovered.

Maxillæ and *Labium*.—Normal; pale-yellow.

Sternum.—Shield-shaped, arched, concolorous, shining.

Abdomen.—Gibbous, somewhat trapeziform, posterior angle much higher than anterior, overhanging base of cephalothorax, pale-yellow, relieved by a series of prominent, shining, coal-black nodules. (Figs. 3 and 4.)



FIG. 3.



FIG. 4.

GENUS THERIDION, Walck.

THERIDION TEPIDARIORUM, C. Koch.

A world-wide species.

FAM. ARGIOPIDÆ.

SUBFAM. LINYPHIINÆ.

GENUS BATHYPHANTES, Menge.

BATHYPHANTES MONTANUS, sp. nov.

(Figs. 5, 6.)

♀ Cephalothorax 1.9 mm. long, 1.7 mm. broad; abdomen, 2.6 mm. long, 2 mm. broad.

Cephalothorax.—Obovate, yellowish, convex. *Pars cephalica* attenuated, arched, obtuse, truncated, furnished with a few rather long, fine, pale hairs in ocular area. *Clypeus* short, not deep. *Pars thoracica* broad, rounded, arched; thoracic and radial grooves distinct; median depression deep; surface finely pilose. *Marginal band* narrow.

Eyes.—Eight, prominent, arranged in two rows. The two comprising the posterior row are very large, and are separated from each other by a space equal to once their individual diameter, and again from each outer lateral eye by rather more than once their individual diameter; lateral eyes contiguous, the outer ones being distinctly larger than the inner; the median anterior eyes are the smallest of the group, and are separated from each other by a space equal to twice their individual diameter; each inner lateral eye is separated from its median anterior neighbour by rather more than once the individual diameter of the latter. (Fig. 5.)

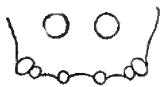


FIG. 5.

Legs.—Long, slender, tapering, yellow, with dark-brown spots and annulations, clothed with fine hairs, and strongly spined. [Note: These limbs are more or less broken, so that it is impossible to quote their relative lengths.]

Palpi.—Short, pale-yellow, similar in clothing and armature to legs.

Falces.—Conical, yellow, arched, pubescent.

Maxillæ.—Short, broad, arched, apices divergent, pale-yellow, inner angles fringed with short pale hairs.

Labium.—Concolorous, short, broad, arched, rounded off at apex.

Sternum.—Coniform, concolorous also, gently arched, pubescent.

Abdomen.—Oval, strongly arched, overhanging base of cephalothorax, yellow, with a faintly discernible leaf-like design on dorsal surface, pubescent.

Epigynum.—A slightly elevated transverse plaque with overhanging lip.
(Fig. 6.)



FIG. 6.

SUBFAM. TETRAGNATHINÆ.

GENUS TETRAGNATHA, Latr.

TETRAGNATHA RUBRIVENTRIS, Doi. = *T. lupata*, L. Koch.

Originally recorded from the island of Amboina, under the generic name *Eugnatha*, which latter has been sunk as a synonym. Koch's specimens were recorded from Port Mackay and Bowen.

TETRAGNATHA NITENS, Aud. in Sav.

This species occurs in Queensland and N. S. Wales; it has also been recorded from Corsica, Egypt, and Mauritius.

GENUS LEUCAUGE, White.

LEUCAUGE CELEBESIANA, Walck.

For synonymy of this widely distributed species see my "Census of Australian Araneidæ," Rec. Aust. Mus., vol. IX., No. 2, p. 170. For a long time this species has been recorded as *Argyropeira celebesiana*, but F. O. P. Cambridge has shown in Biol. Centr. Amer., Ar., I., 1896, p. 184, and again in An. Mag. Nat. Hist., vol. XI., ser. 7, 1902, p. 16, that Emerton's genus (*Argyropeira*) is a synonym of White's *Leucauge*, which was founded in 1841. *L. celebesiana* occurs in N. S. Wales, Queensland, Papua, Malaysia, India, and Ceylon.

SUBFAM. ARGIOPINÆ.

GENUS ARGIOPE, Aud. in Sav.

ARGIOPE ÆTHEREA, Walck. = *A. regalis*, L. Koch, and *A. variabilis*, Bradley.

One of our most beautiful spiders. Around Sydney it is known as "the St. Andrew Cross Spider," on account of the large white \times or *stabilimentum* it constructs at the centre of its web. The species occurs in Malaysia, Papua, Torres Strait, Queensland, N. S. Wales, and Victoria.

GENUS ARANEUS, Clerck.

Simon has gone very extensively into the question of the classification of this ubiquitous genus, and to his "Histoire Naturelle des Araignées," vol. I., 1892 [1895], p. 798 *et seq.*, the student is directed. Of this genus the material from the Blackall Ranges is very meagre, consisting, as it does, of an immature form of what is, in all probability, *Araneus heroine*, L. Koch, and two other species which are apparently new. These latter are herewith described.

ARANEUS HEROINE, L. Koch ?

An immature example. This species occurs both in Queensland and N. S. Wales.

ARANEUS NOTANDUS, sp. nov.

(Figs. 7, 8, 9.)

♀ Cephalothorax, 3·4 mm. long, 1·9 mm. broad ; abdomen, 5·2 mm. long, 3·8 mm. broad.

Cephalothorax obovate, yellow, with a dark median band running from the central group of eyes to posterior angle of thoracic segment ; the band is broadest near the middle of the cephalic segment, and is also darkest laterally. *Pars cephalica* is strongly arched, ascending from base to about midway from junction of thoracic segment, and then gently descending to margin of clypeus ; a short, narrow, dark, lateral stripe runs backwards from each pair of lateral eyes, but does not reach segmental groove ; the surface is clothed with fine, short, pale hairs, which latter are longest within the ocular area. *Clypeus* short, broad, sloping inwards. *Pars thoracica* arched, pubescent, normal grooves and median depression distinct. *Marginal band* narrow, dark-brown.

Eyes.—Normal.

Legs.—Coxæ pale-yellow ; femora pale-yellow also, but darker at junction of patella ; tibiæ pale-yellow, annulated at middle and lower extremities with dark-brown ; metatarsi and tarsi yellow ; all the legs are armed with long, fine spines and clothed with short, dark hairs, which latter impart to the lower joints a rather darkish hue. Relative lengths : 1, 2, 4, 3.

Palpi.—Short, similar in colour and armature to legs.

Falces.—Shining, obscure yellow, clothed with a few fine hairs, arched in front, apices divergent.

Maxillæ.—Short, broad, moderately arched, dark-brown, inner angles pale-yellow.

Labium.—Short, broad, arched, the base dark-brown, apex pale-yellow.

Sternum.—Shield-shaped, gently arched, dark-brown with a somewhat diamond-shaped yellow patch at middle.

Abdomen.—Oval, strongly arched, boldly projecting over base of cephalothorax ; dorsal surface pitchy black, with a broad, pale-yellowish, irregularly shaped design running the entire length ; laterally the colour is also pitchy black with interrupted yellow markings (Figs. 7 and 8) ; ventral surface pitchy black.



FIG. 7.



FIG. 8.



FIG. 9.

Epigynum.—A short, broad, gently arched process, with bluntly acuminate apex. (Fig. 9.)

ARANEUS TRANSVERSUS, sp. nov.

(Figs 10, 11, 12, 13, 14.)

♀ Cephalothorax, 2·1 mm. long, 1·7 mm. broad; abdomen, 4·1 mm. long, 3·8 mm. broad. (Fig. 10.)

Cephalothorax.—Ovate, yellow, with dark-brown markings. *Pars cephalica* narrow, segmental groove distinct; a few pale hairs within the ocular area. *Clypeus* narrow, sloping inwards. *Pars thoracica* arched, normal grooves and median depression distinct. *Marginal band* narrow, pale-yellow.



FIG. 10.

Eyes.—Prominent, surrounded by broad black rings, which latter make the visual organs appear larger than they really are. Distribution normal.

Legs.—Strong, yellow, with dark-brown annulations. Coxæ of first pair dark-brown, all the others pale-yellow; each ambulatory limb clothed with long black hairs and armed with long, strong, concolorous spines. Relative lengths: 1, 2, 4, 3.

Palpi.—Pale-yellow, similar in clothing and armature to legs.

Falces.—Concolorous, arched, apices divergent.

Maxillæ.—Broad, gently arched, pale-yellow.

Labium.—Broad, rounded off at apex, concolorous.

Sternum.—Shield-shaped, gently arched, dark-brown with yellow tubercles or nodes at junction of first, second, and third pairs of legs; there is also a rather broad yellow band running down the centre, which latter is widest at the middle and narrowest at posterior extremity.

Abdomen.—Broadly ovate, projecting over base of cephalothorax, clothed with short, pale, down-like pubescence, yellowish grey, finely reticulated, ornamented with wavy, transverse, dark-brown lines and minute concolorous spots; at apical extremity there is a large and distinctive patch of dark-brown, somewhat leaf-like in design (Fig. 11); this patch is darkest at its outer angles and is further ornamented by a median scheme of delicate tracery, and large, lateral, dark-brown spots; ventral surface yellowish-grey also, relieved by a dark median area, which latter is darkest at the outer angles, and has within its zone a series of seven dark-brown spots arranged in the order of 2, 2, 2, 1; it is also flanked on each side with patches of pale-yellow. (Fig. 12.)



FIG. 11.



FIG. 12.



FIG. 13.

Epigynum.—A slightly elevated plaque with two large lateral pits. (Fig. 13.)

♂ Cephalothorax, 1 mm. long, 0·8 mm. broad; abdomen, 1 mm. long, 0·9 mm. broad.

Cephalothorax.—Obovate, pale-yellow. *Pars cephalica* arched, attenuated in front, segmental groove distinct. *Clypeus* narrow, sloping inwards. *Pars thoracica* broad, arched, normal grooves and median depression distinct. *Marginal band* narrow.

Eyes.—Large, dark, prominent; distribution normal.

Legs.—Yellow, long, tapering, clothed with long, fine, black hairs, and armed with long black spines. Relative lengths: 1, 2, 4, 3.

Palpi.—Pale-yellow, clothed with long concolorous hairs and bristles; genital bulb reddish brown, whorled, and complicated. (Fig. 14.)

Falces.—Pale-yellowish also, arched, hairy, apices divergent.

Maxillæ and *Labium*.—Concolorous, normal.

Sternum.—Shield-shaped, gently arched, concolorous also.

Abdomen.—Ovate, slightly overhanging base of cephalothorax, pale, yellow, hairy.



FIG. 14.

GENUS CELÆNIA, Thor.

CELÆNIA EXCAVATA, L. Koch.

Commonly distributed through Queensland, N. S. Wales, Victoria, S. Australia, and Tasmania.

FAM. THOMISIDÆ.

SUBFAM. MISUMENINÆ.

GENUS CYMBACHA, L. Koch.

CYMBACHA OCELLATA, L. Koch.

This is another immature form, but the species is so distinctive that it is not possible to mistake it. Of the genus *Cymbacha* seven species are known to Australian naturalists, and one of these, *C. similis*, occurs not only on the mainland but also in Tasmania. *Cymbacha* was for many years regarded as an Australian genus, but in 1895 Simon described a species (*C. simplex*) from Ceylon (*op. cit.*, vol. I., p. 1010, footnote).

GENUS THARPYNA, L. Koch.

THARPYNA VENUSTA, L. Koch.

Originally recorded from Sydney; to this locality must now be added the Blackall Ranges of Queensland. Doubtless specimens will ultimately be collected all along the Eastern seaboard of Australia. As the genus *Tharpyna* has been recorded as occurring in Java as well as Australia, it is only reasonable to assume that in all probability it occurs in New Guinea as well. Unfortunately the ARANEIDÆ is a somewhat neglected group, comparatively few naturalists or collectors having paid any attention to them. And yet, notwithstanding this, spiders play a very important part in the economy of nature, rendering invaluable services to man. When these animals shall have been as systematically collected and worked out as the COLEOPTERA have been, many curious and at present mystifying facts in respect of range and other important questions will be cleared up. The genus *Tharpyna* also occurs in New Zealand.

GENUS *DIÆA*, Thor.*DIÆA ADUSTA*, L. Koch.

An immature example.

DIÆA PUNCTATA, L. Koch.

This specimen is also immature.

DIÆA TENUIS, L. Koch.

Of the three species here recorded, the first has, so far as we know, only been found in Queensland; the second and third, on the other hand, are known from both Queensland and N. S. Wales. The genus *Diæa* has a world-wide distribution.

SUBFAM. STEPHANOPSINÆ.

GENUS STEPHANOPSIS, O. P. Cambr.

STEPHANOPSIS ALTIFRONS, O. P. Cambr.

Immature. Widely distributed, occurring in Queensland, N. S. Wales, Victoria, and South Australia.

FAM. CLUBIONIDÆ.

SUBFAM. SELENOPINÆ.

GENUS SELENOPS, Latr.

SELENOPS AUSTRALIENSIS, L. Koch.

This is the only species of its genus known to occur in Australia. It has been found both in East and West Australia.

SUBFAM. SPARASSINÆ.

GENUS ISOPEDA, L. Koch.

ISOPEDA VASTA, L. Koch.

This species is a Queensland form, and is the type of its genus.

GENUS OLIOS, Walck.

OLIOS SALACIUS, L. Koch.

This is the *Heteropoda salacius* of L. Koch, and the *Neosparassus salacius* of Hogg. Twenty-one species of *Olios* have been recorded as occurring in Australia, and most of them are known to inhabit Queensland. The example herein recorded is an immature specimen.

OLIOS DIANA, L. Koch.

Immature. Previously recorded from Victoria, S. Australia, and W. Australia; now known to occur in N. S. Wales and Queensland.

SUBFAM. CLUBIONIDÆ.

GENUS CLUBIONA, Latr.

CLUBIONA NOTABILIS, L. Koch.

Previously recorded from Port Mackay, N. Queensland.

FAM. AGELENIDÆ.

SUBFAM. NICODAMINÆ.

GENUS NICODAMUS, Simon.

NICODAMUS BICOLOR, L. Koch.

A widely distributed species occurring in Southern New Guinea, Australia generally, and Tasmania.

FAM. PISAURIDÆ.

GENUS DOLOMEDES, Latr.

DOLOMEDES FACETUS, L. Koch.

Immature. Widely distributed throughout Australia; it also occurs in New Zealand and the Island of Upolu.

DOLOMEDES TRUX, Lamb ?

Immature ♂ and ♀ specimens of what I believe to be *D. trux* were included in the collection. It is remarkable that Lamb makes no mention of the *epigynum* in his paper, as the type, seeing that it is recorded as being 29 mm. long, must have represented a matured specimen.*

FAM. LYCOSIDÆ.

GENUS LYCOSA, Latr.

LYCOSA GODEFFROYI, L. Koch.

Immature. This species ranges through Queensland, N. S. Wales, and Victoria.

FAM. OXYOPIDÆ.

GENUS OXYOPES, Latr.

OXYOPES MOLARIUS, L. Koch ?

Immature. The examples collected were all immature, and while some of the most advanced point to *O. molarius*, there were others far too young for anything beyond generic determination.

* Since the above was written Mr. Rainbow has had an opportunity of examining the type. See Note on *Dolomedes trux* Lamb, page 197.—THE EDITOR.

FAM. SALTICIDÆ.

GENUS ASTIA, L. Koch.

ASTIA HARIOLA, L. Koch ?

An immature example. The range of this species is Queensland and N. S. Wales.

GENUS BAVIA, Simon.

BAVIA LUDICRA, Keys.

Previously recorded from Rockhampton.

GENUS MENEMERUS, Simon.

MENEMERUS ACUMINATUS, sp. nov.

(Figs. 15, 16.)

♀ Cephalothorax, 3·4 mm. long, 2·3 mm. broad; abdomen (not including spinnerets), 4·3 mm. long, 2·3 mm. broad.

Cephalothorax.—Almost elliptical, rather flat, black, shining, clothed with tawny-grey hairs amongst which are interspersed in the ocular area a few long black bristles. *Pars cephalica* ascending from base to region of posterior eyes, and from thence sloping gently forward; the surface is somewhat uneven, and has lateral elevations or ridges between the rear and median eyes, and again between the latter and anterior lateral eyes; sides declivous, compressed. *Clypeus* broad, curved, deep, clothed with tawny hairs. *Pars thoracica* rather flat at summit, depressed near junction of cephalic and thoracic segments; radial grooves distinct, sloping abruptly to anterior angle, which latter is truncated; sides curving gently outwards from the front to about the middle, and from thence more sharply inwards to posterior angle. *Marginal band* broad, white.

Eyes.—Arranged in three groups of 2, 2, and 4 respectively; the posterior eyes are seated at the lateral angles, and are each separated by a space equal to once their individual diameter from their median neighbours, which latter are minute, and are much the smallest of the series; the anterior row of eyes is procurved; of these the median pair are much the largest of the entire group, and the median lateral eyes, in their turn, are somewhat larger than those of the posterior pair.

Legs.—Short, sturdy, shining black, thickly clothed with long, tawny-grey hairs, and armed with long, fine spines. Relative lengths: 4, 1-2, 3.

Palpi.—Short, not strong, similar in colour and armature to legs.

Falces.—Black, shining, short, strongly arched, nearly vertical, sparingly hairy.

Maxillæ.—Black, arched, shining, inner angles sparingly clothed with fine hairs, outer angles furnished with long, strong bristles.

Labium.—Concolorous, coniform.

Sternum.—Concolorous also, elongate, arched, rather broadest near apical extremity, clothed with long, hoary hairs.

Petiole.—Short, stout, pale.

Abdomen.—Oblong-ovate, not overhanging base of cephalothorax, arched, apex acuminate, dorsal surface densely clothed with tawny-grey hairs (these appear to be hoary in alcohol), and surrounded by a broad, dense girdle of black hairs; sides densely clothed with grey hairs; ventral surface thickly clothed with ashy-grey pile. (Fig. 15.)



FIG. 15.



FIG. 16.

Spinnerets.—Projecting, long, black, clothed with long, grey hairs.

Epigynum.—A prominent, arched, transverse plaque, with large lateral pits, and clothed with long, hoary hairs. (Fig. 16.)

GENUS CLYNOTIS, Simon.

CLYNOTIS SEVERUS, L. Koch.

Vaguely recorded by L. Koch from Australia.

GENUS PYSTIRA, Simon.

PYSTIRA ORBICULATA, L. Koch.

This species occurs both in Queensland and N. S. Wales.

GENUS SERVÆA, Simon.

SERVÆA VESTITA, L. Koch.

Immature. This, the type species of the genus, is very common both in E. Australia and Tasmania.

GENUS OPISTHONCUS, L. Koch.

OPISTHONCUS ALBORUFESCENS, L. Koch.

Identical in range to the above.

OPISTHONCUS MORDAX, L. Koch.

Originally recorded from Sydney, N. S. Wales.

OPISTHONCUS POLYPHEMUS, L. Koch.

Male and female examples of this species were collected. *O. polyphemus* occurs in N. S. Wales, Queensland, and New Guinea.

SOME ARANEIDÆ FROM THE ROPER RIVER, NORTHERN TERRITORY.

BY W. J. RAINBOW, F.L.S., F.E.S.,
Entomologist to the Australian Museum, Sydney.

(Figs. 1, 2, 3.)

To the Director, Dr. R. Hamlyn-Harris, I am indebted for the opportunity of examining a small collection of ARANEIDÆ from the Roper River, N.T. These specimens were collected by Mr. M. J. Colclough for the Queensland Museum. The collection contains about two dozen species, two of which are described as new. Of these I have pleasure in dedicating one (*Dixa colcloughi*) in honour of the collector. As already remarked, the collection is a small one. This is hardly to be wondered at, seeing that the ARANEIDÆ is a somewhat neglected branch of our fauna. The jungle of tropical Queensland, and that vast area comprising the Northern Territory, must, nevertheless, contain many interesting forms at present unknown to science. In a young country such as this the COLEOPTERA and LEPIDOPTERA are naturally among the first of the terrestrial invertebrates to attract attention; but as time advances, and as the two great orders become better known and worked, the ARANEIDÆ will undoubtedly receive that study its importance merits.

FAM. DRASSIDÆ.

SUBFAM. HEMICLŒNIÆ.

GENUS HEMICLŒA, Thor.

HEMICLŒA SUNDEVALLI, Thor.

Both sexes of this species are represented, that of the female being immature. Previously recorded from North Queensland to Sydney, N.S.W.

HEMICLŒA PLUMEA, L. Koch.

A female of this species is represented in this collection. Koch recorded this species from Rockhampton; in the Australian Museum (Sydney) there is a specimen from Bathurst, N.S.W.

HEMICLŒA LIMBATA, L. Koch.

This is an interesting find, since it extends our knowledge of the range of the species. Koch recorded it originally from Sydney. Both sexes were collected.

SUBFAM. DRASSODINÆ.

GENUS DRASSODES, Westr.

DRASSODES (DRASSUS) INVENUSTUS, L. Koch?

The specimen is damaged, but I record it, tentatively, as *invenustus*. Should it prove to be so, the known range of the species will be very much extended, since, up to the present, it has only been known to me as a New South Wales form.

FAM. ZODARIIDÆ.

SUBFAM. ZODARIINÆ.

GENUS STORENA, Walck.

STORENA FORMOSA, Thor.

There can be little doubt that the specimen under reference is the species here quoted. Unfortunately, it is immature. It was captured when about to cast its skin, so that the colour scheme is barely perceptible through the loose integument. Koch recorded *S. formosa*, vaguely, from "Neuholland"; nevertheless, it is widely distributed, examples having been obtained from various localities in Queensland, N. S. Wales, Victoria, and Central Australia.

FAM. PHOLCIDÆ.

SUBFAM. PHOLCINÆ.

GENUS PSILOCHORUS, Simon.

PSILOCHORUS SPHÆROIDES, L. Koch.

Rockhampton, North Queensland, was the original locality from which this species was recorded.

FAM. THERIDIIDÆ.

GENUS LATRODECTUS, Walck.

LATRODECTUS HASSELTII, Thor.

Commonly found throughout Australia, New Zealand, South Pacific Islands, India, Malaysia, Papua, and Eastern Australia. This is the well-known "Katipo" of New Zealand.

FAM. ARGIOPIDÆ.

SUBFAM. ARGIOPINÆ.

GENUS ARGIOPE, Aud. in Sav.

ARGIOPE ÆMULA, Walck.

Distributed throughout Malaysia, Papua, Queensland Felix, and N. S. Wales Felix.

GENUS ARANEUS, Clerck.

ARANEUS BRISBANÆ, L. Koch.

An immature example. The species occurs in Queensland, N. S. Wales, and New Zealand.

FAM. THOMISIDÆ.

SUBFAM. MISUMENINÆ.

GENUS DLÆA, Thor.

DLÆA COLCLOUGHI, sp. nov.

(Figs. 1, 2.)

♀ Cephalothorax, 5.5 mm. long, 4 mm. broad; abdomen, 6.1 mm. long, 8 mm. broad.

Cephalothorax.—Longer than broad, strongly arched, truncated in front, yellow-brown with pale-yellowish markings in the ocular area and on the clypeus. *Ocular area* very much wider than long, angular, lateral angles acute. *Pars cephalica* broad, arched, compressed laterally, sides declivous, surface finely and sparingly granulated. *Pars thoracica* broad, strongly arched, sides and posterior angles declivous, surface finely granulated, radial grooves faintly indicated. *Clypeus* broad, deep. *Marginal band* narrow.

Eyes.—Eight, small, black, arranged in two rows of four each; the posterior row is considerably the widest, and forms a slightly procurved line, while the anterior row is strongly recurved. The eyes of the posterior row are very widely separated from each other; in respect of these the dividing space is much the greatest between the median pair; posterior lateral eyes seated at rear of angular projections; of the anterior row the median eyes are decidedly the smallest, and, although widely separated, are much the closest together of the entire series; front lateral eyes decidedly the largest. (Fig. 1.)

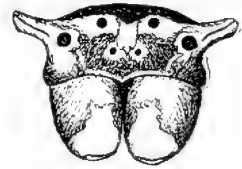


FIG. 1.

Legs.—Shining, yellow-brown; outer angle of femur of first pair pale-yellow; the lower angle of femora of first and second pairs have each a broken transverse band of pale-yellow; the other segments of the first and second pairs are relieved by irregular patches and broken transverse bands of pale-yellow; the third and fourth pairs have no pale-yellow markings; each ambulatory limb is finely pubescent; tibiæ and metatarsi of first and second pairs armed on the underside with a double row of dark, strong spines; tarsal claws black. Relative lengths: 1 = 2, 4, 3.

Palpi.—Short, yellow-brown with pale-yellow markings, hairy, furnished with a few rather long, fine spines or stout bristles.

Falces.—Yellow-brown with large, irregular, pale-yellow patches, short, arched.

Maxillæ.—Yellow-brown, long, narrow, arched, apices inclining inwards.

Labium.—Concolorous, long, coniform.

Sternum.—Concolorous also, shield-shaped, truncated in front, very slightly arched, smooth, sparingly hairy.

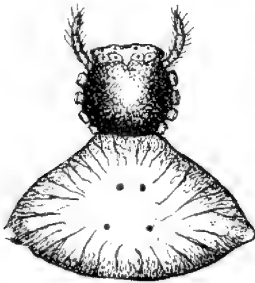


FIG. 2.

Abdomen.—Somewhat pentagonal, slightly overhanging base of cephalothorax, strongly arched, broadest beyond the middle where there is on the outer angle at each side a small coniform projection; this latter directed outwards; pale-yellow, dorsal surface with four small yellow-brown spots, of which the anterior pair are the smallest and closest together; laterally the surface is ornamented by numerous fine, irregular, lateral, thread-like lines, suggestive of delicate tracery; these latter are continued to the ventral surface, and some terminate near the spinnerets. (Fig. 2.)

Epigynum.—A simple, slightly arched, transverse plaque, with a deep, broad, median pit, having a curved, overhanging lip.

FAM. CLUBIONIDÆ.

SUBFAM. SPARASSINÆ.

GENUS DELENA, Walck.

DELENA CANCERIDES, Walck.

The collection includes an immature ♂ of this species, the range of which embraces the mainland of Australia and the island of Tasmania.

GENUS OLIOS, Walck.

OLIOS SALACIUS, L. Koch.

Represented by both mature and immature forms. Previously recorded range, Queensland to N. S. Wales.

OLIOS DIANA, L. Koch ?

An immature ♀ of what I take to be this species, the previously known geographical range of which was Victoria, South and Western Australia.

OLIOS HÆMORRHODALIS, L. Koch ?

Another immature example, the previously known habitat of which was N. S. Wales.

GENUS HETEROPODA, Latr.

HETEROPODA VENATORIA, Linn.

Commonly known as the "House Spider" of the tropics. This species is very common on the mainland of Australia. Originally it came from India, from whence it spread by "ballooning" to all those regions influenced by the N.E. and S.E. trade winds.

SUBFAM. CLUBIONINÆ.

GENUS CLUBIONA, Latr.

CLUBIONA VACUNA, L. Koch.

A Northern form, originally recorded from Port Mackay.

CLUBIONA NOTABILIS, L. Koch.

Another Northern form, also first recorded from Port Mackay.

FAM. LYCOSIDÆ.

GENUS LYCOSA, Latr.

LYCOSA GODEFFROYI, L. Koch.

A ♂ example differing merely in colour pattern from the typical form.

LYCOSA LÆTA, L. Koch.

An immature ♀ of this species, the range of which as previously defined was North Queensland and Central Australia.

LYCOSA OBSCURA, L. Koch.

A ♂ of this species was obtained. Its range as previously recorded was Queensland, N. S. Wales, Victoria, and South Australia.

FAM. SALTICIDÆ.

GENUS ARASIA, Simon.

ARASIA MOLLIOMA, L. Koch.

An immature example of this species is included in this collection. It has been previously recorded from Queensland and N. S. Wales.

GENUS SAITIS, Simon.

SAITIS PISCULA, Keys?

This is another immature example, and a ♂. The specimen certainly bears a close superficial resemblance to Keyserling's species, but as the genital bulb is not uncovered it is not possible to speak with certainty.

GENUS OCRISIONA, Simon.

OCRISIONA COMPLANATA, L. Koch.

A widely distributed species. It is found in Queensland, Masthead Island (Great Barrier Reef), N. S. Wales, and Noumea.

GENUS CLYNOTIS, Simon.

CLYNOTIS VIDUUS, L. Koch.

Previously recorded from Queensland and N. S. Wales.

GENUS MOLLICA, G. W. and E. G. Peckh.

MOLLICA JUCUNDA, sp. nov.

(Fig. 3.)

♀ Cephalothorax, 3·4 mm. long, 2·8 mm. broad; abdomen, 5 mm. long, 3 mm. broad.

Cephalothorax.—Glossy black with purple reflections when viewed in certain lights and at certain angles, clothed with long hairs. *Pars cephalica* high, compressed laterally, sloping forward, sides declivous, hairs generally black, but there is at the rear of each posterior eye a broad crescent-shaped band of hoary hairs. *Pars thoracica* arched, normal grooves and indentations indistinct, sides declivous, sloping abruptly to posterior angle. *Clypeus* deep, sloping inwards. *Marginal band* narrow, pale-yellow, almost white. (Fig. 3.)

Eyes.—Eight, grouped in three series of 2, 2, 4. Anterior row of four strongly recurved, grouped closely together; of this series the median pair are decidedly the largest of the eight; the lateral eyes, again, are rather larger than the posterior pair; the median eyes are, as usual, small, and each is placed about midway between its anterior lateral and posterior neighbours.

Legs.—Anterior pair rather long and extremely robust; the second pair are robust also, but less markedly than the first; third and fourth pairs slender and tapering. The first pair has the coxa and femur yellow; patella yellow at junction of femur, thence black; tibia black; metatarsus yellow for about one-third its length, thence black; tarsus yellow, but black at extremity. Of the second pair the coxa, femur, and patella are yellow; the tibia yellow for about one-half its length, thence blackish. The third and fourth pairs are yellowish throughout. All the ambulatory limbs are thickly clothed with long hairs, those on the black portions being black, and the rest yellowish. Relative lengths: 1, 4, 2, 3.

Palpi.—Short, strong, black, hairy.



FIG. 3.

Falces.—Strong, arched, apices divergent, black, thickly clothed with long, coarse hairs; except at the base and inner angles, where the hairs are hoary; this hirsute clothing is black.

Maxillæ.—Short, broad, arched, black, hairy.

Labium.—Coniform, arched, hairy, concolorous.

Sternum.—Concolorous also, shield-shaped, hairy.

Abdomen.—Ovate, arched, slightly projecting over base of cephalothorax, black; the dorsal surface thickly clothed with coarse, rather long, black and hoary hairs; these latter have the effect of producing a somewhat conventional and striking design marked by patches and transverse bands; the sides and ventral surface black and hairy.

Epigynum.—A slightly arched, rather broad transverse plaque with two deep lateral pits; the surface is so densely clothed with long hairs that this organ is almost obscured, and it is very difficult indeed to define its outline and structure.

NOTE.—There were several examples of this handsome species, and these show that *Mollica jucunda* is exceedingly variable, both in size and abdominal colour design. In some examples there is scarcely a trace of any design dorsally, the surface appearing an almost uniform grey.

NOTE ON DOLOMEDES TRUX, Lamb.

BY W. J. RAINBOW, F.L.S., F.E.S.,
Entomologist to the Australian Museum, Sydney.

(Figs. 1, 2, 3.)

IN *Annals of the Queensland Museum*, No. 10, 1911, p. 173, Mr. J. Lamb described a new species of *Dolomedes* under the above name. By courtesy of Dr. Hamlyn-Harris, I have had the privilege of examining the type. The species is apparently a valid one, but a few details in amplification of Lamb's description appear essential. They are, together with figures, as follow :—

Cephalothorax.—Reddish-brown, but somewhat darkest over ocular area; median and radial grooves distinct, dark-brown; sides somewhat paler than the upper portion. *Marginal band* broad, pale yellowish (nearly white).

Abdomen.—In nature, slightly overhanging base of cephalothorax; strongly arched above and moderately so below; yellow-brown, mottled with darker brown markings on superior surface; these latter suggest, when the specimen is wet, a somewhat leaf-like design; at rather less than one-third its length from anterior extremity there are two small, but distinct, dark-brown dorsal spots or impressions, and these are separated from each other by a space equal to 2 mm.; near the middle there are two more somewhat smaller, though equally distinct, dark-brown spots or impressions, and these are separated from each other by a space equal to 4 mm. (Fig. 1.) Underside lighter in colour, with a distinctive median design. (Fig. 2.)



FIG. 1.



FIG. 2.

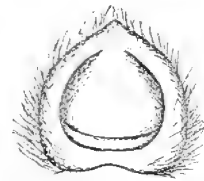


FIG. 3.

Epigynum.—Small, arched, deeply grooved both in front and laterally. (Fig. 3.)

NEW SPECIES OF CESTODES FROM AUSTRALIAN BIRDS.

BY T. HARVEY JOHNSTON, M.A., D.Sc., F.L.S., Biology Dept., University, Brisbane,
Hon. Zoologist, Queensland Museum.

DILEPIS BANCROFTI n. sp.

(Pl. 15, figs. 1-7.)

THIS parasite, which may measure 96 mm. in length and possess a maximum breadth of almost 3 mm., occurs fairly frequently in the rosella parrot, *Platycercus eximius* Shaw, in New South Wales and Southern Queensland.

The scolex is a small pyriform organ, .146 mm. in diameter, and succeeded directly by the segmented strobila. The suckers (.050 mm. in diameter) and rostellum are small. Owing to the retracted condition of the latter in all specimens examined, the characters of the hooks were not determined.

The proglottids are thin and flat; they overlap very slightly and do not project prominently laterally. The genital pores open on the right-hand margin of the strobila on the summit of a well-marked papilla in the anterior half of each segment.

The cuticle is quite thin. Below it, the longitudinal musculature is arranged in two series, an outer ring of very numerous small bundles or, rather, fibres, and an inner ring of much larger bundles. Above and below the central portion of the medulla, the bundles may be more closely massed together. Both dorso-ventral and transverse fibres are weakly developed. In regard to the excretory system, there are present dorsal and ventral canals as well as commissural vessels between ventral trunks, but the dorsal tubes are very small and lie directly above the wide ventral canals. The sex-ducts pass above both excretory vessels and the longitudinal nerve, which is situated just laterally from the ventral canal. The male duct lies parallel to and just above the vagina, opening dorsally to the latter into the narrow common genital canal.

The testes consist of from sixty to seventy vesicles (about .025 mm. in diameter), arranged in two layers, and lying laterally from the centrally situated female complex. A few vesicles are present behind and above the

vitellarium. Some overlie the uterine branches and also some of the ovarioles. The vas deferens is an uncoiled tube passing outwards almost in a straight line to enter the cirrus sac. The latter is a pyriform structure nearly .2 mm. long and .09 mm. broad at its inner end, which contains a small vesicula. The cirrus appears to be short.

The ovary is a large organ, consisting of numerous ovarioles and situated anteriorly in the mid-region of the segment. Behind it lies the irregularly lobed vitellarium. Between the two is the shell-gland above which is part of the receptaculum seminis. The vagina travels inwards from the female pore which is just below the male aperture, a sphincter surrounding its outer end. Its course is below and parallel to the male duct but above the excretory canals. After passing over the latter, the lumen becomes somewhat widened and the vagina rises dorsally above the ovary and the developing uterus. That portion which overlies the ovary, the shell-gland, and part of the vitellarium, is much wider and constitutes a receptaculum seminis. In the region of the shell-gland it meets with the oviduct which travels postero-dorsally from the ovary, and also the vitelline duct which passes forwards and upwards. The fertilising duct or, rather, the narrow uterine duct, so formed, continues anteriorly below the receptaculum but above the ovary as a sinuous tube. Just above the mid-region of the female gland, it enters the transversely situated tubular uterus. Each branch of the latter extends outwards and backwards between the ovarioles, and curves downwards to pass below the testes, terminating near the posterior angle of the segment, where it may overlie the excretory vessels. The single tube soon develops caeca which become larger, so that ultimately the uterus comes to consist of two much-branched tubes more or less filling the segment with their ramifications. It thus has not quite the form typically met with in species of *Dilepis*.

The species is named in honour of Dr. T. L. Bancroft, of Eidsvold, Burnett River, who for several years past has rendered me assistance in collecting material.

CHOANOTÆNIA ZONIFERÆ n. sp.

(Pl. 15, fig. 8.)

A few fragments of a small delicate cestode, probably belonging to the genus *Choanotenia*, were taken from a black-breasted plover, *Zonifer tricolor* Vicill., shot near Bathurst, N.S. Wales. Sexually mature segments are trapezoidal (fig. 8) and possess a breadth of about .33 mm., while egg-bearing proglottids are .8 mm. wide. The genital pores alternate fairly regularly, the ducts apparently passing between the excretory canals.

The testes occupy a restricted zone behind the female glands and consist of from twenty to twenty-five vesicles arranged in two or three layers. Some partly overlies the ovarian wings. The vas deferens is thrown into coils above the inner end of the cirrus sac. The latter is a tubular structure, about .15 mm. long and .02 mm. wide.

The bilobed ovary is slightly displaced from the midline towards the pore-bearing edge and its transversé axis is somewhat obliquely placed. The triangular vitellarium lies just behind it, being overlapped anteriorly by part of the large shell-gland. The female pore is situated just behind the male aperture. Passing inwardly from it is the wide thin-walled sinuous vagina which crosses above the ovary. The mature uterus is a sac-like structure occupying the posterior portion of the segment. Ripe eggs measure .045 mm. in diameter, the oncosphere being about .019 mm.

CHOANOTÆNIA TAYLORI n. sp.

(Pl. 16, figs. 9, 10.)

Length about 30 mm.; maximum breadth .8 mm. From the intestine of a blue wren, *Malurus cyanochlamys* Sharpe, collected by Dr. J. B. Cleland near Adelaide, South Australia.

The specimens are poorly preserved, and sections have not been of much use. The scolex is relatively small (.13 mm. broad), and bears prominent suckers (.045 mm. in diameter) and rostellum. Hooks had fallen away from the specimens. The genital pores alternate fairly regularly, the sex-ducts passing above the ventral vessel and nerve. Transverse vessels are present but dorsal canals were not recognised.

There are about twenty testicular vesicles, .04 mm. in diameter, arranged in a group behind the female complex. The vas deferens forms a coiled mass overlying the inner end of the cirrus sac, which is a pyriform organ .013 mm. long and .04 mm. in maximum width, containing a spiny cirrus, .080 mm. long when everted.

Each lobe of the ovary is irregularly branched. The large vitellarium lies behind it. The narrow vagina lies just behind, and parallel to, the cirrus sac, but bends backwardly to pass above the middle of the ovary. The mature uterus is suggestive of that occurring in *Monopylidium* and in certain species of *Choanotænia*. Eggs measure about .038 mm. in diameter, the contained oncosphere being .019 mm. in diameter and the hooklets .013 mm. long.

The species is named after my friend Mr. F. H. Taylor, Entomologist to the Australian Institute of Tropical Medicine, Townsville, who has at various times assisted me by collecting entozoa.

ZOSTEROPICOLA CLELANDI n. gen., n. s.p.

(Pl. 16, figs. 11-15.)

Length 40 mm.; greatest breadth 0.6 mm.

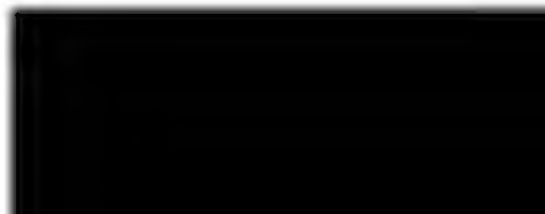
This parasite infests the common silver-eye, *Zosterops cerulescens* Lath., specimens having been collected by Dr. J. B. Cleland, Mr. J. O. Heinrich, and myself at various times, in the neighbourhood of Sydney.

The scolex is a relatively large rounded organ, .35 mm. broad, with four suckers measuring .13 mm. in diameter, and a small retractile rostellum bearing a single row of fairly long stout hooks whose characters were not determined. There is a gradual narrowing to form an unsegmented neck region beyond which are numerous narrow segments. Further back the proglottids become more trapezoidal, the posterior margins projecting prominently (fig. 13). It is in the narrow segments that male maturity is reached (fig. 12). Genital pores alternate fairly regularly and lie in the anterior half of each proglottis. The sex-ducts pass below the nerve and both excretory canals.

The longitudinal musculature consists of two concentric series, each composed of numerous bundles, those of the outer ring being smaller than those of the inner. A well-defined interval separates the two groups. Delicate transverse and dorso-ventral fibres are recognisable. Lying above and inwardly from each ventral excretory vessel is a small dorsal tube, while the transverse or commissural canal extends between the ventral vessels in the form of an arch. The main longitudinal nerve is situated laterally from each ventral canal.

The male organs consist of usually five vesicles, rarely four or six, placed in a line and occupying a dorsal position in the middle of the segment. One of the testes may be at a lower level than the remainder. They measure about .02 mm. in diameter. The male duct travels ventrally, becoming thrown into coils in the neighbourhood of and also within the cirrus sac. The latter is a small organ .065 mm. long and .02 mm. wide at its inner end, terminating in a short genital cloaca. As already mentioned, both the male and female ducts pass below the excretory canals and nerve.

The female complex is difficult to interpret. It approaches the pore-bearing edge and appears as an elongate mass below the testes. The individual organs—ovary, vitellarium, shell-gland—were not distinguished. The vagina, which opens beside and just behind the male aperture, travels inwards becoming slightly swollen to form a receptaculum seminis lying ventrally and anteriorly to the uterus in ripening segments. In the mid-region of ripe proglottids and those approaching maturity is a mass of modified tissue continuous with, but distinct from, the uterus. It is in this paruterine organ, in the posterior segments, that the eggs come to lie. It does not possess a definite cavity. The uterus is a simple, rounded, well-defined sac lying postero-ventrally to it. Eggs measure .04 mm. by .030 mm., the embryo possessing a diameter of .021 mm.



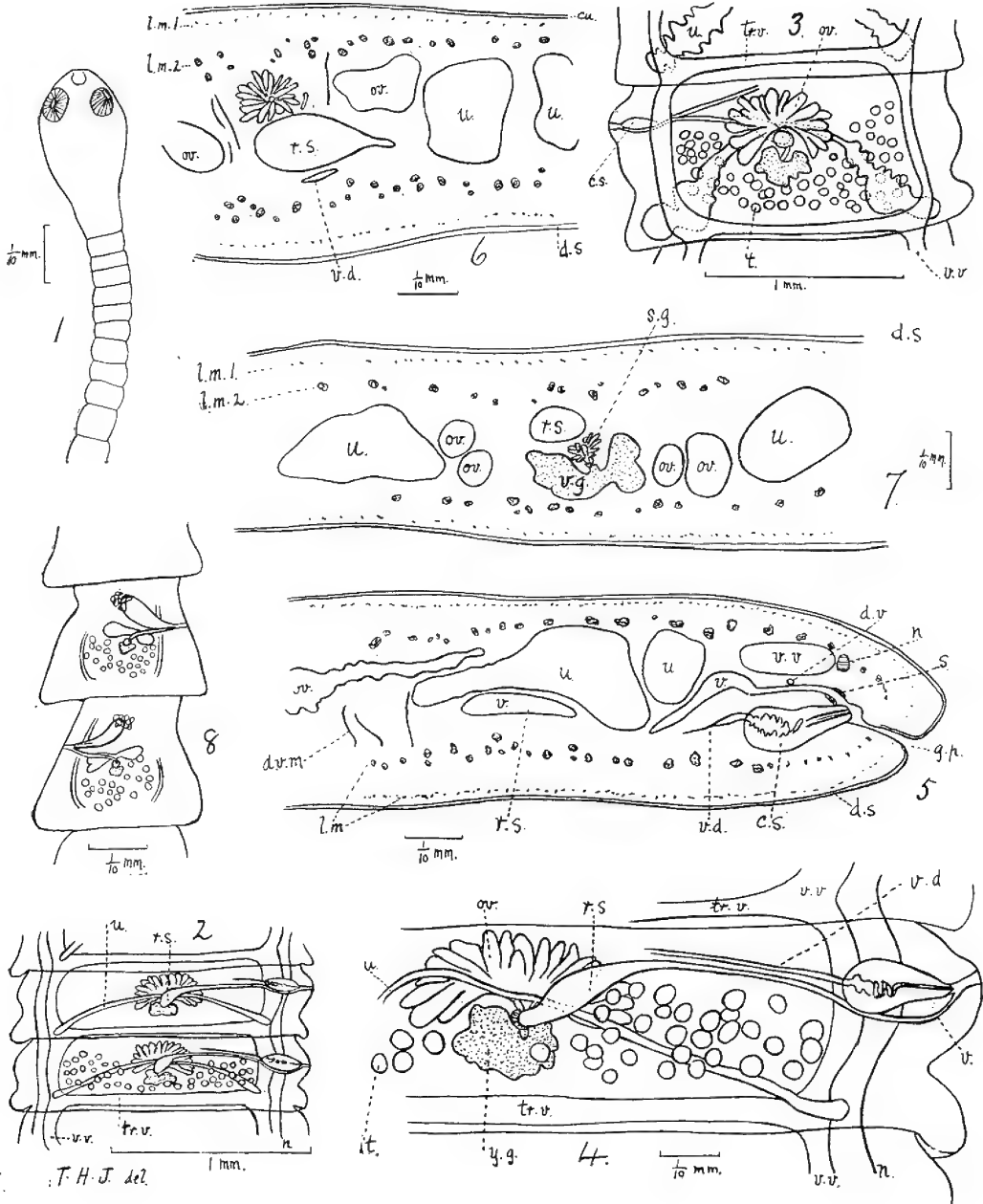


FIG. 1-7.—*Dilepis bancrofti* Johnston.

FIG. 8.—*Choanotenia zonifera* Johnston.



This species, with which I associate the name of my former colleague, Dr. J. B. Cleland, of Sydney, possesses characters which appear to me to be of generic importance, consequently a new genus *Zosteropicola* is erected to receive it. The provisional characters may be summarised thus:—

Scolex armed with single circle of hooks; genitalia alternating more or less regularly; testes few (about five), and arranged in a line transversely; genital ducts passing below the excretory vessels and the longitudinal nerve; paruterine organ present. Family Hymenolepididæ; subfamily Paruterininae.

This genus lies very near *Anoncholænia* Cohn, but differs from it in the arrangement of the testes and also in the possessing of hooks on the scolex.

Type: *Z. clelandi* Jnstr.

Host: *Zosterops carulescens* Lath.

The types of all the above species have been deposited in the collection of the Queensland Museum, Brisbane; their registered numbers being—*Dilepis bancrofti*, G 12/114; *Choanotænia zoniferæ*, G 12/112; *C. taylori*, G 12/111; and *Zosteropicola clelandi*, G 12/113.

DESCRIPTION OF PLATES.

PLATE 15.

Fig. **DILEPIS BANCROFTI.**

1. Scolex.
- 2, 4. Sexually mature segments (dorsal).
3. Ditto, (ventral).
5. Transverse section of segment.
6. Ditto, showing vitellarium.
7. Ditto, showing shell-gland.

CHOANOTÆNIA ZONIFERÆ.

8. Segments showing anatomy (dorsal).

PLATE 16.

CHOANOTÆNIA TAYLORI.

9. Scolex.
10. Segment.

ZOSTEROPICOLA CLELANDI.

11. Scolex.
12. Segments showing male and female genitalia (dorsal).
13. Segments showing uterus, etc.
14. Transverse section of segment.
15. Longitudinal horizontal section of segments.

Explanation of Lettering.—*c.*, cirrus; *c.s.*, cirrus sac; *cu.*, cuticle; *d.s.*, dorsal surface; *d.v.*, dorsal vessel; *d.v.m.*, dorso-ventral muscle fibres; *e.*, eggs; *g.c.* genital cloaca; *g.p.*, genital pore; *l.m.* 1., *l.m.* 2., longitudinal musculature; *n.*, longitudinal nerve; *o.v.*, ovary; *par.*, paruterine organ; *r.s.*, receptaculum seminis; *s.*, sphincter; *s.g.*, shell-gland; *t.*, testis; *tr.m.*, transverse muscle fibres; *tr.v.*, transverse excretory vessel; *u.*, uterus; *v.*, vagina; *v.g.*, vitellarium; *v.s.*, vesicula seminalis; *v.v.*, ventral excretory vessel.

NOTE ON BLANCHARDIA MACULATA, Castelnau.

THIS fish was described as a "small sort of *Muraenidæ*" by Count Castelnau on p. 47 of a paper published in 1875 and entitled "Researches on the Fishes of Australia." A short time ago when examining some dried specimens of small fishes in the Queensland Museum I found a specimen labeled as above, which I believe to be Castelnau's type; my reasons for this belief are threefold—(1) The specimen is of the size given by Castelnau; (2) Castelnau's species is not included in the list of his types in the Paris Museum as sent by M. Eugène Bouvier to the Australian Museum; and (3) Castelnau states that certain of the species described by him in this paper belonged to "two collections of fishes, one from Queensland and one from Cape York, sent to me for examination by Mr. Staiger, the curator of the Brisbane Museum"; presumably this is one of the first mentioned collection. The identity of this so-called muraenid has always been a puzzle to Australian workers, and this find is therefore valuable as proving that *Blanchardia maculata* Castelnau is merely a synonym of *Nolograptus guttatus* Günther. That Castelnau took his description from a dried specimen, as seems to have been the case, would fully account for the discrepancies between Günther's and his generic descriptions, namely—his failure to find the tubular anterior nostrils, the barbel, and the ventral fins.

J. D. O.



