water containing the excreta of Blood-sucking flies; and that one portion of the Life History of the *Filaria* is passed in the body of the fly from which, by one means or another, it makes its re-entrance into the human body.

MONDAY, JUNE 24TH, 1878.

The Hon. W. MACLEAY, F.L.S., in the Chair.

MEMBER ELECTED.

Mr. FRENCH, of the Botanic Gardens, Melbourne.

DONATIONS.

From the Royal Society of N. S. W.: Journal and Proceedings for 1877.

From the New Zealand Institute: Transactions and Proceedings for 1877.

From Harward College, U. S.: Bulletin of the Museum of Practical Zoology.

From Dr. Schomburgh: Catalogue of the Plants in the Botanic Gardens, Adelaide; Report of the Botanic Gardens, Adelaide.

From La Societé Entomologique de Belgique: Compte Rendu Serie II, No. 50.

Phylloxera Vastatrix, by K. I. Staiger, F.L.S., Brisbane.

Pituri and Duboisia, by Dr. Bancroft. By the authors.

PAPERS READ.

Notes on the Fishes of the Norman River.

By COUNT F. DE CASTELNAU.

The Norman River flows into the Gulf of Carpentaria, and a small settlement has of late years been formed on its banks, about twenty miles from its mouth.

Mr. Gulliver, who has resided two years in this settlement, and has done much for the zoology of that remote part of Queensland, has sent me two collections of fishes from this river, and Mr. Staiger, the curator of the Brisbane Museum, has placed in my hands a collection he had also received from the same collector. I have thus been able to determine twenty-five sorts, the greater part of which appears to me to be new. They are as follows:—

Lates calcarifer, Bloch.
Pseudoambassis Macleayi, Cast.
„ *elongatus*, Cast.
Accanthoperca gulliveri, Cast.
Gulliveria fusca, Cast.
„ *fasciata*, Cast.
Therapon fasciatus, Cast.
„ *terræ-reginæ*, Cast.
„ *caudovittatus?* Richard.
Corvina albida, Cuv. Val.
Scatophagus multifasciatus, Rich.
Toxotes carpentariensis, Cast.
Kurtus gulliveri, Cast.
Periophthalmus australis, Cast.
Gobius sauroides, Cast.
Eleotris simplex, Cast.
„ *planiceps*, Cast.
Mugil dobula, Gunther.
„ *compressus*, Gunther.
Arius australis, Gunther.
Plotosus elongatus, Cast.
Belone krefftii, Gunther.
Engraulis aasutus, Cast.
Chatœssus erebi, Gunther.
Leuciscus australis, Cast.

LATES CALCARIFER.

Lates calcarifer, Bloch., pl. 244.
Lates nobilis, Cuv. Val., vol. II, p. 96, pl. 13.
Holocentrus heptodactylus, Lacep., vol. IV, p. 391.

The præopercle presents at its angles a strong acute spine and three others rather smaller below this ; this fish has been known for many years, from the mouths of the great Indian rivers, but it is only lately that it has been discovered in some of the Queensland rivers.* It is found in the Fitzroy river, and is known at Rockhampton under the name of *Burrumundi*, which name also has been erroneously applied to the *Ceratodus* of the Burnett river. It attains enormous proportions and is second in size to none of the Australian fresh water fishes except perhaps to the Murray cod *(Oligorus macquariensis)*.

Mr. Gulliver has discovered this sort in the Norman river, and has sent a large specimen to the Brisbane Museum.

PSEUDOAMBASSIS.

I propose this name for some small fishes closely allied to *Ambassis*, but having no recumbent spine in front of the dorsal. They seem to be rather numerous in the northern parts of Australia.

1.—Pseudoambassis macleayi. *sp. nov.*

Upper profile high, and convex in front of the dorsal ; the two limbs of the præopercle strongly serrated ; the upper one on the angle (three or four spines) and on the lower edge ; the lower one on all its length ; the spines of the inferior edge the largest, and directed backwards ; the lower edge of the opercle also lined with similar spines ; two lines of scales on the cheeks ; the height of the body more than one half the total length without the caudal fin ; scales large, numbering about thirty on the longitudinal line, and sixteen on the transverse one ; first dorsal with seven spines ; the first of which is very short, the second the longest, and nearly as long as the head ; the second dorsal with a very long and straight spine and ten rays ; caudal very strongly bifurcated, with the ends pointed ; anal with three strong spines, of which the third is rather the longest, and ten rays ; the colour, after having been in spirits, is of a uniform light brown, with the fins yellow.

Numerous specimens, the largest being under two inches and a half long.

* P. Z. S., 1870, p. 824.

I have much pleasure in naming this sort after Mr. W. Macleay, who bearing the name of one of the most illustrious naturalists of the century, has himself done so much for the zoology of Australia, and who most nobly devotes a large fortune to promote the knowledge of the productions of his adopted country.

2.—PSEUDOAMBASSIS ELONGATUS.* *sp. nov.*

Form elongated; upper profile little convex; two lines of scales on the cheeks; upper limb of the præopercle very finely serrated on the corner (four or five) and on the lower edge; the lower limb only serrated on its lower edge; the caudal strongly bifurcated with the ends pointed; the general colour is grey without any yellow tinge.

Several specimens not much over one inch long.

ACANTHOPERCA. *nov. gen.*

One dorsal formed of two equal parts and received in a scaley sheath on the back; scales rather large; opercle ending in an acute angle over the base of the pectorals; præopercle having two ridges; the upper one having two blunt spines at its lower angle, and the lower one being straight at its posterior edge, but strongly serrated at its angle and on its lower edge; præorbital strongly serrated; teeth villiform in both rows, and a few very fine ones on the palatine bones; mouth rather extensile; maxillaries extending as far as the anterior third of the eye; lateral line continuous extending on the base of the tail; dorsal having its two portions about equal; the spinous formed of seven strong spines, the first being very short, the second very long contained only about twice in the height of the body, the others going shorter; the soft portion begins by a long, straight spine, nearly two-thirds as long as the second of the spinous part; the rays number ten, and go on decreasing in height as they extend backwards; caudal strongly bifurcated; anal with three spines, the first of which is short, the second very large, flat, sword-like

* The *Ambassis papuensis*, Macleay Proc. Lin. Soc. of New South Wales, Vol. I, p. 226, pl. V, fig. 4, forms a third sort of this genus. It is very much like my first sort but quite distinct. The profile is less elevated; there is only one line of scales on the cheeks; the præopercle has only one strong spine at its angle; the lobes of the tail are rounded; it has a general orange tint on the dried specimen.

and very pointed; the third more slender and shorter; the rays number nine; the ventrals have a very strong sword-like spine; the pectorals are rather long.

This genus has much the form of *Ambassis*, but there is only one dorsal.

ACANTHOPERCA GULLIVERI. *sp. nov.*

Form compressed, high, strongly arched on the upper profile behind the head; the lower jaw longer than the upper one; eye large, contained three times and a half in the total length of the head; height of body twice in the total length without the tail; lateral line arched and extending on the base of the tail, covering about forty scales, the transverse line of about twenty scales. The specimens are in a dry state, and I can say nothing of the colours except that there are on the back traces of longitudinal black lines.

My largest specimen is about eight inches long.

GULLIVERIA. *nov. gen.*

Teeth on both jaws very numerous, short, conical, pointed, swollen and rounded at the base, placed irregularly and crowded; no canines; tongue smooth; an angular line of teeth on the palate; præopercle either without any denticulations or with very feeble ones; opercle with a flat soft spine; two dorsals; the first with six spines, the second with a long spine; anal with two spines; general form oval, compressed; scales moderate or rather large; lateral line continuous, not extending on the caudal; maxillaries extending to the posterior edge of the eye; opening at the mouth rather oblique.

This genus belongs to the PERCIDÆ.

1.—GULLIVERIA FUSCA. *sp. nov.*

Body oval, rather elongate; contained nearly three times in the total length without the caudal fin; head twice and three quarters in the same length; eye three times and three quarters in the head; snout as long as the diameter of the eye, obliquely truncated in front, shorter than the lower jaw; upper part of the head with strong and deep impressions; all parts of the head

covered with scales; lateral line running over about forty scales; these rather large and ciliated on their edges; first dorsal placed over the middle of the length of the body, having six strong spines of which the first alone is very short, and the second the longest; the second dorsal is well separated from the first; it is formed of one slender spine and ten rays; the caudal is rather long and truncated; the anal has two spines, one very short, and one long and slender, and nine rays; the ventrals have a strong spine and are situated below or a little in front of the pectorals; colour entirely brown. Length a little over four inches.

2.—Gulliveria fasciata. *sp. nov.*

Body a little more elongate than in *G. fusca;* lower limb of the præopercle distinctly serrated; back of a light brown colour, lower parts of silvery; four black transverse bands extend from the back to the side; one below the first dorsal, one below the second, another on the middle of the tail, and the last on the end of this organ. Length a little over three inches.

Therapon fasciatus, *Cast.*

Therapon fasciatus, Cast. Researches on Fishes of Australia, 1876, page 11.

I described this species from a specimen from the Swan river, but I find several in Mr. Gulliver's collection from the Norman river; these are preserved in spirits and in a much better state than those I had seen previously. I find that the dorsal has, apart from the twelve spines of its first portion, a long straight one belonging to the soft part; the caudal has its lower edge black and three very faint transverse bands. The transverse bands of the body extend to about two thirds of its height.

Therapon terræ-reginæ, *Cast.*

Therapon terræ-reginæ, Cast. Proc. Lin. Soc. N. S. W., vol. II, page 227.

The specimen on which I formed this species is not now in my possession having been returned to the Brisbane Museum, so I cannot compare the specimens that I have from the Norman river with the type; but I have very little doubt that they belong to the

same species; the soft dorsal seems to be subject to considerable variation in the number of its rays, as in a large specimen I find ten, in others nine, and in one only eight.

This species is nearly allied to *Therapon argenteus* of Cuvier, on which this naturalist formed the genus *Datnia*.

THERAPON CAUDOVITTATUS.

There is a rather large specimen dried and in a very bad state that seems to belong to this species.

CORVINA ALBIDA, *Cuv.*

Corvina albida, Cuv. Val. vol. V, page 93.
„ „ Gunther Cat. vol. II, page 309.

I was much surprised to find this Indian and Chinese species in a river of northern Australia. It attains a considerable size but this specimen is only twenty inches long. It is remarkable for the very large, sword-like spine of its anal fin.

SCATOPHAGUS MULTIFASCIATUS, *Rich.*

Scatophagus multifasciatus, Richard. Ereb. and Terr. or, p. 57, pl. 35.

In the specimens from the Norman river the spines of the first dorsal are alternately very broad or slender. I had for some time thought these formed a distinct species, but this fact is observable in several other fishes of the same family. If this distinction proves to be constant I propose to distinguish this sort under the name of *S. altermans*.

TOXOTES CARPENTARIENSIS. *sp. nov.*

Resembles very much *T. jaculator*, and still more *T. microlepis*, but the dorsal is a little more forward, as by a perpendicular drawn from its base, the pectoral would be cut at more than one-fourth of its length; this dorsal is much lower, the longer spines being contained three times and three-fourths in the height of the body; these spines number six, all slender; the third and fourth being the longest; the rays number twelve; the caudal is forked; the anal has three feeble spines and sixteen rays; the length of the snout considerably less (two thirds) than the space between the

orbits, or very little more than the diameter of the orbit. Having seen only one specimen nine inches long, preserved in salt, I can say nothing of the colours.

NOTE.—There are in the collection two very young specimens, about an inch long, that I believe to belong to this sort ; they are preserved in spirits and show distinctly four broad transverse dark bands on the body.

KURTUS GULLIVERI, *Cast.*

Kurtus gulliveri, Cast. Proc. Lin. Soc. of N. S. W., vol. II, p. 233.

This curious fish was found by Mr. Gulliver in a fresh water pond near the Norman river.

PERIOPHTHALMUS AUSTRALIS, *Cast.*

Periophthalmus australis, Cast. Researches Austr. Fishes, p. 22.

Several small specimens about two inches long ; having been in spirits, the colour is slatey gray, with the belly white.

GOBIUS ? SAUROIDES. *sp. nov.*

It is with some doubt that I place this fish in the genus *Gobius*. It has the form, and nearly the dentition of a SAURUS. The body is elongate, its height being contained five times in the total length, without the caudal ; the head is three times and a half in the same ; the eyes are small and directed upwards ; the lower jaw is considerably longer than the upper one ; on this there are two lines of sharp, elongate, conical teeth, the inner one directed backwards, and the outer one formed of rather strong canines placed at some distance from one another ; on the lower jaw there is in front, a line of large, strong, curved canines, and on the sides a double line of them ; numerous depressions cover the upper side of the head, which is entirely naked, except on the upper part behind the eyes where the scales are small ; on the body there are thirty seven series of scales on the longitudinal line ; these are large, angular, ciliated, and covered with striæ ; and also several series of small ones at the end of the tail ; first dorsal with six spines, second with eight rays ; anal with ten ; the second dorsal and the anal have their last rays prolonged ; caudal rather long, pointed ; the ventrals separate except at the base and placed on a disk ; pectorals extending to the twelfth line of scales ; the scales on the lower side in front of the ventrals

are very small. The colour, after having been preserved in spirits, is of a light yellow brown, darker on the upper surface; the fins except the ventrals and pectorals, have lines of small dark spots. The specimen is seven inches long.

ELEOTRIS SIMPLEX. *sp. nov.*

Enters in Gunther's division, characterised by scales rather large; snout short, depressed; general form a very long oval; snout flat on its upper surface, shorter than the diameter of the eye; aperture of the mouth rather oblique; maxillaries much shorter than the anterior edge of the eye; head entirely scaley except on the snout; height of body contained four times in total length (without the caudal) and equal to the length of the head; body scales large, about twenty-eight on the longitudinal line; they are finely striated on their surface and ciliated on their edges; first dorsal of six rays or soft spines; second of one spine and ten rays; the last of these are high, and extend considerably further than the base of the caudal, which fin is pointed; anal having the same form as the second dorsal with one feeble spine and ten rays.

The only specimen is preserved in liquor; it appears to have been yellow with the dorsal, caudal and anal marbled with brown. Three inches long.

ELEOTRIS PLANICEPS. *sp. nov.*

Belongs to the division characterised by scales large, snout broad and flat; eight series of scales between the origin of the first dorsal and the anal; height of body contained three times and two-thirds in the total length without the caudal; head very flat, covered, except on the snout with minute scales; the eye is small and contained nearly six times in the length of the head; the lower jaw is rather prominent; the maxillary extends to nearly the verticle from the posterior margin of the eye; teeth villiform in broad bands on both jaws; body covered with large scales, numbering thirty three on the longitudinal line; the body is very convex with the tail long; first dorsal low, of six rays; the second dorsal higher of nine rays; the caudal long and pointed;

anal with one spine and eight rays; pectorals extending to the base of the anal; preserved in liquor the fish appears black with the fins lightly marbled with yellow.

The specimen is three and a half inches long.

MUGIL DOBULA, *Gunth.*

Mugil dobula, Gunth. Cat. vol. III, page 420.

Head moderately broad; body of a long oval; pectorals not extending to the perpendicular drawn from the base of the dorsal; an adipose eyelid. This species has been observed in several rivers in New South Wales.

MUGIL COMPRESSUS, *Gunth.*

Mugil compressus, Gunth. Cat. vol. III, page 49.

Body very much compressed, very high at the base of the first dorsal; head nearly pointed; no adipose eyelid.

Inhabits also the rivers of New South Wales.

ARIUS AUSTRALIS, *Gunth.*

Arius australis, Gunther Proceedings of the Zool. Soc. 1867, page 103.

The largest specimen is about seven inches long; the caudal is very strongly forked; general colour silvery; the upper parts scaley.

NOTE.—The specimen described by Dr. Gunther was much larger, and came from the Hunter river.

PLOTOSUS ELONGATUS, *Cast.*

Plotosus elongatus, Cast. Proceedings Lin. Soc. of N. S. W., vol. II, page 237.

Two specimens about eight inches long; colour of a dark brown with the lower parts silvery.

NOTE.—There are also several very young and immature specimens of a *Siluroid* belonging, I believe, to the genus *Plotosus* but having the end of the caudal slightly rounded and not prolonged as in the preceding species.

BELONE KREFFTII, *Gunth.*

Belone krefftii, Gunth. Cat. vol. VI, page 250.

A very large sort, remarkable for its compressed tail; the head is contained twice and a half only, in the total length without the caudal fin. The largest specimen is over 22 inches long.

ENGRAULIS NASUTUS. *sp. nov.*

Height of the body contained rather more than three times in total length without caudal; the head four times and a half in the same length; snout obtuse produced projecting considerably beyond the lower jaw;* teeth very fine on both jaws; maxillary considerably prolonged; origin of the dorsal fin at the centre of the body without the caudal; this fin is strongly forked; there are twelve rays at the dorsal; anal long, formed of 32 rays, extending considerably behind the dorsal; abdomen compressed and entirely spiney; I can say but little of the colours of this species, of which I have only seen one adult specimen seven inches long, but I have a small specimen preserved in spirits, which is silvery with the upper parts of a light brown, fins yellow.

CHATOSSUS EREBI.

Chatossus erebi, Gunth. Cat. vol. VII, page 207.

„ *Come*, Richard. Ereb. and Terr. p. 61, pl. 38.

Found in the Brisbane river and also in the rivers of northern Australia.

LEUCISCUS ? AUSTRALIS. *sp. nov.*

Body elongate, very compressed; its height contained four times in the total length without the caudal; head nearly five times in the same length; lower jaw longer than the upper one; no teeth on the jaws nor on the palate; eye rather large, contained three times and a half in the length of the head; maxillary extending to the exterior third of the eye; lateral line continuous on the upper third of the body; scales of moderate size; dorsal fin placed in front of the middle of the length of the body of fourteen rays; caudal bifurcated; anal fin inserted a little behind the end of the dorsal, of eighteen rays; the ventrals a little in front of the dorsal; pectorals inserted below the opercle. The fish is of an orange colour becoming yellow on the belly; the head is silvery no definite band on the side; length of the type specimen about one inch and a half.

NOTE.—The specimen is very small and not in a very good state, and I may be mistaken about the palatine teeth; all I can say is that I can see none.

* On the upper surface of the head extends a strong longitudinal ridge.