

NOTES ON FISHES FROM WESTERN AUSTRALIA.—No. 3.¹

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(Plates viii.—xvii., and fig. 23.)

A third collection of Fishes from Western Australia has been forwarded to the Trustees, by Mr. Bernard H. Woodward, Curator of the Western Australian Museum.

This collection is larger, and richer in novelties than the preceding ones, and yields three new genera :—

Neatypus of the family Scorpididæ

Bramichthys of the Bramidæ

Dipulus of the Brotulidæ.

Nine species are described as new :—

Catulus labiosus.

Synodus sageneus.

Neatypus obliquus.

Chaetodon assarius.

Bramichthys woodwardi.

Cynoglossus broadhursti.

Dipulus cæcus.

Pseudomonacanthus galii.

Chaetodermis maccullochi.

Figures of these are supplied, and also of the following known species, not previously illustrated :—

Terapon humeralis, Ogilby.

Hypsipops microlepis, Günther.

Pseudolabrus punctulatus, Günther.

Patecus maculatus, Günther.

Many of the fishes received are duplicates of those previously determined, and are not included in the present paper. A number of species, however, known from Western Australia is herein enumerated; these claim inclusion by virtue of the precise localities recorded. The majority of such are new to the west coast, they having previously been known from King George's Sound only, which, though politically in the Western State, is on the south coast of the Continent.

¹ No. 1. Rec. Austr. Mus., iii., 1900, pp. 210-216, pl. xxxvii.; No. 2. *Ibid.*, iv., 1902, pp. 179-194, pls. xxvii-xxxi.

The types of the new species have been returned to the Western Australian Museum.

The collection, as originally received, was supplemented by a number of fishes recently taken by means of the trawl.

I am indebted to Mr. C. F. Gale for a copy of the Annual Report on the Fishing Industry of Western Australia.² The Report for 1904 contains an account of the first trawling operations undertaken in the State. From this we learn that the ketch "Rip," a vessel of ninety tons, was chartered for the purpose and that the trawl was shot no less than one hundred and one times, the greatest depth reached being 40 fathoms. Five charts accompany the report, showing various stations from Cape Naturaliste, northward to Shark's Bay. Trawling was also tried off Rottnest Island and Houtman's Albrolos.

It is to be deplored that no professional zoologist was aboard the "Rip," and it cannot be doubted that, in consequence, much valuable material and information has been lost. A tally was certainly taken in fishermen's style, but the mere enumeration of "soles, gurnard, flathead, rays, cod, leather-jackets, etc.," conveys no precise information. Records of edible fishes only appear to have been preserved, no detailed account having been taken of the smaller forms which furnish food for the edible ones or which may be, in other ways, concerned in their economy. With the exception of crustaceans and sponges no account whatever was taken of the Invertebrate life, such being entered as "marine growth," and, judging by the experience gained in H.M.C.S. "Thetis" in the waters of New South Wales, an immense wealth of such forms must have been netted.

The collection is said to contain representatives of all the fishes obtained; it requires, however, a trained eye to discriminate in this matter, and it must be evident, as above hinted, that many species taken were lost sight of; in fact some fishes are enumerated in the report, examples of which were not forwarded. Of these I may instance skate, electric, sting and other rays, trumpeter, john dorey, horse mackerel, flathead, whiting and skipjack. Many of the takes are entered as "small fish of all kinds" or "a lot of fish of other classes," and in no case is it possible to associate a specimen with the particular station whence it was obtained; the mere mention of say, red mullet, cod, parrot fish or gurnard gives no clue to the species taken.

At the 41st haul a sea snake, four feet long, was netted, and on August 7th and 10th whales were freely encountered.

² Western Australia—Rept. Fishing Industry and Trawling Operations, 1904 (1905).

A small sailing vessel is not suited for trawling investigations and the promoters were evidently much handicapped by want of a proper boat. When further operations are undertaken it is to be hoped that the whole project will be placed in competent scientific hands. The services of a professional Zoologist, in an undertaking of this kind, should be recognised as a necessity in Australia equally with Europe and America.

Mr. Woodward asks me to state that the Trustees of the Western Australian Museum are greatly indebted to Mr. C. F. Gale, the Chief Inspector of Fisheries for Western Australia, and to Mr. F. C. Broadhurst, for the fishes obtained by means of the trawl.

CATULUS LABIOSUS, *sp. nov.*

(Fig. 23).

Length of head 7.75 in the total length; width of head 1.06; length of snout 3.2; interorbital width 2.66; width of mouth 1.54; diameter of eye 4.4; and length of pectoral fin 1.1 in that of the head.

Nasal valves separate, each produced into a lobe directed outwards and backwards; the distance between the two slightly more than the basal width of one lobe. No cirrus. A long

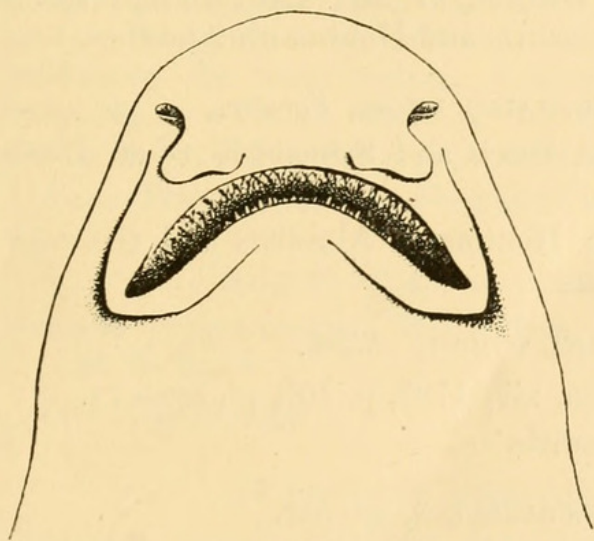


Fig. 23.

Catulus labiosus.

labial fold round the angles of the mouth, the fold of the upper jaw produced anteriorly beyond the lobe of the nasal valve and to within a short distance of the nostril; the folds of the lower jaw approach each other to within the length of the base of one of the nasal lobes. These features are illustrated in the accompanying figure, which is two-thirds natural size.

Teeth in several rows in both jaws, those of the lower jaw, the larger; all have a small cusp on each side. Head much depressed, its width considerably more than its length in advance of the spiracles. Body elongate, the vent in advance of the middle of the total length. First dorsal fin inserted above the hinder edge of the vent.

Colours.—Brown above, lighter beneath. Hinder part of head, the body and the under surface, from between the pectorals backwards, ornamented with fairly uniform black spots. The dorsals, anal and caudal similarly marked: three series of spots on the ventrals tend to form transverse bars. One example—a male—620 mm. in length.

Loc. Fremantle.

ELOPS SAURUS, *Linnaeus*.

Elops saurus, Linnaeus, Syst. Nat., ed. xii., 1766, p. 518.

Loc.—Murray River, near Mandurah.

CLUPANODON NEOPILCHARDUS, *Steindachner*.

Clupea neopilchardus, Steindachner, Denk. K. Akad. Wiss. Wien, xli., 1879, p. 12.

Loc.—Houtman's Abrolhos.

GYMNOTHORAX PUNCTATOFASCIATUS, *Bleeker*.

Gymnothorax punctatofasciatus, Bleeker, Ned. Tijdschr. Dierk. i., 1863, p. 167.

Loc.—Three examples referred to this East Indian species were trawled between Fremantle and Houtman's Abrolhos.

TRACHINOCEPHALUS MYOPS, *Forster*.

Salmo myops, Forster, in Bloch and Schneider, Syst. Ichth., 1801, p. 421.

Loc.—Trawled between Houtman's Abrolhos and the mainland of Western Australia.

SAURIDA TUMBIL, *Bloch*.

Salmo tumbil, Bloch, Ichty., xii., 1795, p. 100, pl. cccxxx.

Loc.—Trawled off Fremantle.

SYNODUS SAGENEUS, *sp. nov.*

(Plate viii., fig. 1.)

D. 12; A. 15 V. 8; P. 13; L. l. 52; L. tr. 4/7

Length of head 3.66; height of body 7.0 in the total length. Diameter of eye 7.8; and length of snout 4.8 in that of the head. Interocular space equal to the orbital diameter. The head is subquadrangular in section, a long shallow groove above, extends from the tip of the snout to the occipital region. Snout

greatly depressed, acute and broader than long. The orbit cuts the upper profile, the upper half being directed superiorly, the outer half sublaterally. The jaws are equal, and the premaxillary is 1.56 in the length of the head.

The body is very stout, broader than high; the caudal peduncle quadrangular. Origin of dorsal nearer the adipose fin³ than the snout by an eye's diameter. The anterior rays, when depressed, reach just beyond the insertion of the last ray, which is not filamentous, the second ray is a little shorter than the length of the fin or 1.8 in that of the head. The anal increases in length backward, its last ray being twice the diameter of the eye. The inner ventral rays are very long, the sixth being 1.25 in the length of the head, and reaching beyond the posterior insertion of the dorsal; the pectoral is short and rounded, and the caudal deeply forked.

Scales.—The tip of the snout and the median groove as far as the eyes are smooth. The top of the head including the upper, hinder and lower margin of the eye is rugose, as is also the upper edge of the humerals. Seven rows of scales on the cheek, and about three on the upper part of the opercle. No keel on the lateral line.

Colours.—Yellow above and silvery beneath. All the scales broadly margined with reddish brown, the effect being very marked on the lower surface. Owing to the roundness of the body, the number of scales in the transverse series, cannot be shown in the illustration. One example, 265 mm. in length.

Loc.—Trawled between Fremantle and Houtman's Abrolhos.

AULOPUS PURPURISSATUS, Richardson.

Aulopus purpurissatus, Richardson, Icon. Pisc., 1843, p. vi., pl. ii., fig. 3.

Loc.—Mandurah.

CENTRISCUS SCUTATUS, Linnaeus.

Centriscus scutatus, Linnaeus, Syst. Nat., ed. i., 1758, p. 336.

Saville Kent mentions this species as occurring on the Barrier Reef, but in respect to colouration his figure seems rather to represent *Aeoliscus strigatus*, Günther, recorded from Cape York; it must however be noted that the spine of the cuirass is represented as unjointed, and that three dorsal spines are

³ The adipose fin is absent, but a pit suggests its position

shown in the membrane below, these are characters of *C. scutatus*. *Amphisile cristata*, De Vis,⁴ appears to be a synonym of *C. scutatus*, the presence of "three radiating dorsal spines" suggesting that the spine of the cuirass was unjointed; the example described was taken at Noosa on the Queensland coast between Brisbane and Wide Bay, it measured eleven inches (280 mm.) in length.

Loc.—Two fine examples of equal size (222 mm.), forwarded by Mr. Woodward, were trawled in the waters to the north of Houtman's Abrolhos.

MYXUS ELONGATUS, *Günther*.

Myxus elongatus, Günther, Cat. Fish. Brit. Mus., iii., 1861, p. 466.

Loc.—Mandurah.

SPHYRÆNA OBTUSATA, *Cuvier & Valenciennes*.

Sphyræna obtusata, Cuvier and Valenciennes, Hist. Nat. Poiss., iii., 1829, p. 350.

The Abrolhos Islands have furnished us with two examples of this species: it thus ranges along both east and west coasts of the Continent. It is not recorded by Lucas (1890) from Victoria nor by Johnston (1890) from Tasmania.

Castelnau records *S. novæ-hollandiæ*, Günther, from Western Australia. This species is common along the southern and south-eastern seaboard, and is also known from Tasmania.

BERYX AFFINIS, *Günther*.

Beryx affinis, Günther, Cat. Fish. Brit. Mus., i., 1859, p. 13.

Though not previously recorded from the west coast, its known distribution would suggest its inclusion as a member of the fauna.

Loc.—Houtman's Abrolhos.

HOLOCENTRUM RUBRUM, *Forskal*.

Sciæna rubra, Forskal, Descr. Anim., 1775, p. 48.

Loc.—Mandurah.

MONOCENTRIS GLORIA-MARIS, *De Vis*.

Cleidopus gloria-maris, De Vis, Proc. Linn. Soc. N. S. Wales, vii., 1882, p. 368.

⁴ De Vis—Proc. Linn. Soc. N. S. Wales, ix., 1885, p. 872.

An example taken by the trawl between Houtman's Abrolhos and the mainland is an addition to the fauna of Western Australia. The species was previously known only from Eastern Australia, southward to Port Jackson.

It is evident from Dr. Boulenger's⁵ account of the distribution of the genus that the Mauritius species is referable to *M. japonicus* and not to *M. gloria-maris* as might be suspected.

ACANTHISTIUS SERRATUS, Cuvier & Valenciennes.

Plectropoma serratum, Cuvier and Valenciennes, Hist. Nat. Poiss., ii., 1828, p. 399.

Hitherto the coast of New South Wales has been regarded as the restricted habitat of this species, though specimens recorded from "Australia" may have been obtained from other coasts.

The collection includes three specimens, two of which are normal and indistinguishable from examples taken in Port Jackson; the third has, in addition to the usual spots, four dark vertical bands, wider than the interspaces; the first embraces the occiput and the first two dorsal spines, the second the sixth to eleventh spines, the third is at the base of the anterior rays and the fourth includes the hinder rays and portion of the caudal peduncle, the two last, only, reach the ventral profile. There are also markings on the head similar to those of *A. cinctus*. Examples from New South Wales have been, though rarely, seen in which similar markings are traceable, though in a much less degree than in the example above described.

Loc.—Houtman's Abrolhos.

CENTROGENYS VAIGENSIS, Quoy & Gaimard.

Scorpaena vaigensis, Quoy and Gaimard, Voy. "Uranie et Physicienne," 1824, p. 324, pl. lviii., fig. 1.

Loc.—North West Australia.

EPINEPHELUS FASCIATUS, Forskal.

Perca fasciata, Forskal, Descr. Anim., 1775, p. 40.

Loc.—Houtman's Abrolhos.

COLPOGNATHUS DENTEX, Cuvier & Valenciennes,

Plectropoma dentex, Cuvier and Valenciennes, Hist. Nat. Poiss., ii., 1828, p. 394.

Loc.—Houtman's Abrolhos.

⁵ Boulenger.—Cambridge Nat. Hist., vii., Fishes, 1904, p. 656.

LATES CALCARIFER, *Bloch*.

Holocentrus calcarifer, Bloch, Ichty., vii., 1790, p. 100, pl. ccxlv.

Loc.—Houtman's Abrolhos.

LUTIANUS CHRYSOTÆNIA, *Bleeker*.

Mesoprion chrysotenia, Bleeker, Nat. Tijds. Ned. Ind., ii., 1851, p. 170.

Loc.—Houtman's Abrolhos.

TERAPON HUMERALIS, *Ogilby*.

Therapon humeralis, Ogilby, Proc. Linn. Soc. N. S. Wales, xxiv., 1899, p. 177.

(Plate ix.)

Of three examples forwarded, one exceeds the dimensions of the type, measuring 210 mm. The accompanying illustration depicts our smallest specimen of natural size, and, as will be seen, it differs somewhat from the type in the extent of its colour markings. In this the body bands extend below the lateral line, and the upper portion of the body and caudal peduncle are spotted, in addition to the vertical fins.

Loc.—The range of the species cannot yet be extended, all known examples being from Houtman's Abrolhos.

PENTACEROPSIS RECURVIOSTRIS, *Richardson*.

Histiopertus recurvirostris, Richardson, Voy. "Ereb. and Terr.", 1845, p. 34, pl. xxii., fig. 5-6.

Loc.—Fremantle. Also trawled; the "Striped Boarfish" mentioned in the Fisheries Report, probably referring to this species.

PSEUDOCROMIS MUELLERI, *Klunzinger*.

Pseudochromis muelleri, Klunzinger, Sitzb. Akad. Wiss. Wein, lxxx., 1879, p. 370.

Cichlops filamentosus, Macleay, Proc. Linn. Soc. N. S. Wales, v., 1881, p. 570.

The examples described by Klunzinger and Macleay were both obtained from Port Darwin. Those forwarded from the Western Australian Museum were taken on the North-Western Coast of the Continent, and are therefore additions to the fauna of the Western State.

CICHLOPS LINEATUS, *Castelnau*.

Damperia lineata, Castelnau, *Researches Fish. Austr.*, 1875, p. 30.

Loc.—Houtman's Abrolhos.

SCIÆNA ANTARCTICA, *Castelnau*.

Sciæna antarctica, Castelnau, *Proc. Zool. Soc. Vict.* i., 1872, p. 100.

Loc.—Mandurah.

CHILODACTYLUS NIGRICANS, *Richardson*.

Chilodactylus nigricans, Richardson, *Proc. Zool. Soc.*, 1850, p. 63.

Loc.—Houtman's Abrolhos.

CHIRONEMUS MACULOSUS, *Richardson*.

Threpterus maculosus, Richardson, *Proc. Zool. Soc.*, 1850, p. 70, pl. ii., figs. 1-2.

The collection includes one example of this species. It agrees exactly with Richardson's description and figure, which are sufficiently exhaustive. Though the number of dorsal spines is correctly copied as fourteen, by Günther⁶, they are for generic purposes rendered as fifteen in the synopsis (p. 70), this number applies only to *C. georgianus* and *C. marmoratus*.

Loc.—The specimen examined is from Houtman's Abrolhos and measures 270 mm. in length.

POMADASIS HASTA, *Bloch*.

Lutjanus hasta, Bloch, *Ichty.*, vii., 1790, p. 87, pl. ccxvi., fig. 1.

Loc.—Fremantle.

SCOLOPSIS BIMACULATUS, *Rüppell*.

Scolopsis bimaculatus, Rüppell, *Atlas Fische*, 1828, p. 8, pl. ii., fig. 2.

Loc.—Houtman's Abrolhos.

TEPHRÆOPS TEPHRÆOPS, *Richardson*.

Crenidens tephraeops, Richardson, *Voy. "Ereb. and Terr."*, 1846, p. 69, pl. xli., fig. 1.

Loc.—Houtman's Abrolhos.

⁶ Günther—*Cat. Fish. Brit. Mus.*, ii., 1860, p. 78.

UPENEUS POROSUS, *Cuvier & Valenciennes*.

Upeneus porosus, Cuvier and Valenciennes, Hist. Nat. Poiss., iii., 1829, p. 455.

Specimens taken at Fremantle are possibly co-specific with the example recorded by Castelnau as *U. vlamingii*.

SCORPIS GEORGIANUS, *Cuvier & Valenciennes*.

Scorpis georgianus, Cuvier and Valenciennes, Hist. Nat. Poiss., viii., 1831, p. 503, pl. ccxlv.

Loc.—Mandurah.

NEATYPUS, *gen. nov.**Family* SCORPIDIDÆ.

Head and body compressed, completely scaled. Scales moderate, finely ciliated and irregularly arranged; lateral line complete. Mouth small, transverse, slightly protractile. Maxillary small; a broad band of trilobed movable teeth in each jaw: vomer and palatines toothless. Gill membranes united, free from the isthmus. Seven branchiostegals. Gill-rakers long. A single dorsal with ten spines and about twenty-two rays, the spinous portion well developed but shorter than the soft; anal with three spines, the second long and strong, and about eighteen rays. The bases of the spinous portion and the whole of the soft portion of both fins, densely covered with small scales. Caudal scaled like the vertical fins. Pectoral with fifteen rays, the upper of which are longest, the tip rounded. Ventrals inserted close together, behind the base of the pectorals, spine strong.

The genus is allied to *Atypichthys*, Günther⁷, differing by the character of the teeth and the scaly base of the spinous portion of the vertical fins. The greater vertical development of these fins at once distinguishes it from *Scorpis*, and possibly also from *Parascorpis*. The small mouth prevents any confusion with *Atyposoma*, and the general habit with other two genera included by Dr. Boulenger⁸, *Psettus* and *Henoplosus* (*Enoplosus*).

It has much the habit of *Chætodon*, but differs therefrom by the nature of the teeth and by the gill membranes being free from the isthmus. Of this last character Boulenger writes under *Chætodontidæ*⁹:—"Closely allied to and evidently derived from

⁷ Günther.—Cat. Fish. Brit. Mus., ii., 1860, p. 64, and iv., 1862, p. 510.

⁸ Boulenger.—Cambridge Nat. Hist., vii., Fishes, 1904, p. 666.

⁹ Boulenger.—*Loc. cit.*, p. 667.

the more generalised types of the *Scorpididae*, differing in the attachment of the gill-membranes to the isthmus." Though valid for the family, as a whole, this character does not hold good for *C. (Microcanthus) strigatus* in which the membranes are united and free from the isthmus.

NEATYPUS OBLIQUUS, *sp. nov.*

(Plate x.)

D. x. 22; A. iii. 18; V. i. 5; P. 15; C. 17; L. lat. 51.

Length of head 3·8; height of body 2·1 in the total; diameter of eye 2·5; length of snout 3·9 and of caudal 2·0 in the length of the head; interorbital space convex, slightly less than the diameter of the eye; hinder limb and angle of preopercle denticulated, lower limb smooth.

Body compressed, ventral profile but little lower than that of the dorsal.

Fins.—The dorsal fin originates above the margin of the opercle, the spines regularly increase in height to the sixth, which is 1·7 in the length of the head, the following spines are but slightly lower, the anterior rays are of the same height as the last spines, and gradually decrease in length, the contour of the fin is thus unbroken. The anal commences beneath the beginning of the soft dorsal. Its second spine is very strong and long, much longer than the sixth dorsal and 1·3 in the length of the head; the third spine is weaker and a little shorter; the anterior rays are longer than the corresponding ones of the dorsal, and the margin of the fin is almost straight. The ventral spine is equal to the fourth dorsal, and the longest rays are of the same length as the pectoral, 1·4 in that of the head. The caudal is emarginate and the depth of its peduncle is equal to the diameter of the eye.

Colours.—The ground colour is pale grey, with six oblique dark brown bands, each of which is bordered with black. The first is double above, the anterior portion arising between the eyes, with a strong concavity to the front, the posterior portion passes from above the hinder margin of the eye, and merged with the anterior limb, passes downwards across the preopercle to the ventral spine. The second band originates on the occiput, crosses the edge of the opercle and base of the pectoral fin, and attains the lower profile at the middle of the adpressed ventral spine. Each band becomes successively more oblique, the third passing from the base of the three first dorsal spines to the commencement of the anal. The next band joins the v.-vii. dorsal spines

and the middle of the anal fin. The fifth band originates at the posterior dorsal spines and proceeds to the posterior anal rays, the last band runs nearly parallel to the margin of the dorsal rays and on to the caudal peduncle, the four posterior bands extend on to the scaly portion of the dorsal and anal fins.

Loc.—Two specimens, taken at Houtman's Abrolhos, the larger measuring 152 mm. in length.

EPHIPPIUS MULTIFASCIATUS, Richardson.

Scatophagus multifasciatus, Richardson, Voy. "Ereb. and Terr.", 1846, p. 57, pl. xxxv., figs. 4-6.

Loc.—Fremantle. The "Butter Fish" mentioned as having been trawled may refer to this species.

CHÆTODON ASSARIUS, sp. nov.

(Plate xi., fig. 1).

D. xiii. 21 ; A. iii. 17 ; V. i. 5 ; P. 16 ; C. 17 + 6.

Length of head 3·7 ; of caudal fin 5·2 ; height of body 1·5 in the total length. Diameter of eye 3·0, and length of snout 3·5 in that of the head. Interocular space convex, equal to the diameter of the eye. Preoperculum smooth, body ovate, strongly compressed ; the upper profile rounded, the lower convex. The fifth dorsal spine is the highest, its length twice the diameter of the eye ; from this point the fin falls gradually away to an obtuse angle at about the middle of the rayed portion. The second anal spine is longest, its length being one-half that of the head ; this fin is evenly rounded ; the ventral spine is 1·6 in the length of the head, and the longest pectoral ray 1·3 in the same.

The scales are in regular series, not in contrary directions, those of the middle of the sides larger than the others ; the lateral line forms an even arch, lower than the dorsal profile and terminates in advance of the posterior insertion of the dorsal fin.

Colours.—Ground colour yellow or pale brown, snout darker, the dark ocular band is complete above and is a little narrower than the eye, above the orbit it is bordered before and behind with a light band, below it extends to the margin of the subopercle. The body bears, on its upper half, four very narrow dark vertical bars slightly inclined forward below, they pass downwards from the bases of the fourth, sixth, eighth and tenth dorsal spines respectively. The dorsal fin is narrowly edged with black ; following the angle, the colour becomes submarginal, the extremity of the rays being white. A black white-edged

ocellus is present in the angle. The margin of the anal is a rather broad white band within which is a dark brown one, very narrow at the spines but increasing in depth so that it occupies nearly the whole of the posterior rays. Pectoral and ventral without markings. A very faint broad bar across the caudal peduncle, in line with the anal band.

Length of specimen 119 mm. trawled in the waters between Fremantle and Houtman's Abrolhos.

This species has affinities with *C. mertensii*, Cuvier and Valenciennes and the very closely allied *C. dixonii*, Regan: differential characters are the angulate soft dorsal with its contained ocellus, the sub-vertical and scarcely oblique body bars which have a different inclination from those of the other species mentioned, also the absence of the yellow area on the posterior part of the body. Bleeker placed his *C. xanthurus* as synonymous with *C. mertensii*, but Mr. C. T. Regan appears to regard this as distinct also.¹⁰

CHELMONOPS TRUNCATUS, Kner.

Chaetodon truncatus, Kner., Sitzb. Acad. Wiss. Wien, xxxiv., 1859, p. 442, pl. ii.

Loc.—The specimen trawled between Houtman's Abrolhos and Fremantle is the largest I have seen, measuring 222 mm. in length.

HYPSIOPS MICROLEPIS, Günther.

(Plate xii.)

D. xii.-xiii. 15-18; A. ii. 13-16; V. i. 5; P. 21; C. 17.

The great variation which this species undergoes during the course of its growth is responsible for several erroneous determinations and additions to the synonymy.

The changes which take place during the life of the species to maturity, have been lately studied by Mr. Allan R. McCulloch, and the following notes are based upon his observations.

In the smallest specimens examined (15 mm.), the characteristic markings are developing, but are not clearly defined; the scales also are incomplete, the head and back as far as the dorsal fin being naked. The scales do not yet appear on the fins, and the caudal is emarginate. All the rays are simple.

¹⁰ Regan.—Ann. Mag. Nat. Hist., (7), xiii., 1904, p. 277.

Specimens 22 mm. in length present a most gorgeous appearance, being of brilliant orange colour, tempered on the upper part of the body by numerous black dots, which are much larger in the space between the dorsal and anal fins. Three broad dark-edged blue lines run from the head backwards; the first arises on the snout, behind the upper lip, where it is connected with its fellow on the other side, and skirts the profile to the anterior dorsal spines; the second, indicated in front of the eye, passes across the upper part of the eyeball and above the lateral line to a large black blue-edged ocellus, which occupies the last six spines and portion of the back beneath; the third runs from the corner of the mouth, below the eye, across the opercle, and is continued as a dot above the basal portion of the pectoral fin. There may also be two or three similar dots between the pectoral and the caudal. A large dark spot is also present on the upper part of the caudal peduncle. The spinous dorsal fin is reddish, with a blue margin, the bases of the soft dorsal and anal are orange, the remaining portion and of the pectoral and caudal hyaline. Ventral fin orange, the first, elongate, ray and the anterior edge of the anal black. This stage is illustrated in fig. 1.

Somewhat larger examples were identified by Bennett with *Glyphisodon biocellatus* and by the writer with *G. brownriggii*.

In a much later stage, represented by examples measuring 72 mm. in length, the dorsal stripes are relatively much narrower and are broken, the lowermost being indicated by dots only, the ocellus is more restricted in area, being confined to the last two spines. A white patch is present on the opercle and numerous blue spots occur on the hinder half of the body and soft dorsal and caudal fins. The general colour is darker than in younger specimens, this being most noticeable in the ventral and anal fins, which are of greenish-black hue. This phase is represented in fig. 2, and approaches the specimens named *Parma microlepis* by Günther.

The adult, which attains a length of 160 mm., is wholly black, with the exception of the white opercular patch which is persistent. Traces of the dorsal ocellus and supra-caudal blotch may also exist.

The adult is represented in fig. 3, and such examples owe to Günther the name *Parma squamipinnis*.

Chief among the changes incident to growth may be mentioned the increased depth of the body, the reduced size of the eye and the narrowing of the preorbital.

The generic named *Parma*, Günther, is here regarded as synonymous with *Hypsipops*, Gill. Some notes on this question will be found in an earlier issue of the Records.¹¹

The synonymy of the species would appear to be as follows :—

HYPSIPOPS MICROLEPIS, Günther.

Glyphisodon biocellatus, Bennett, Proc. Zool. Soc., xxvii., 1859, p. 222,

Pisces, pl. ix. (not *G. biocellatus*, Cuvier and Valenciennes.)

Parma microlepis, Günther, Cat. Fish. Brit. Mus., iv., 1862, p. 57.

Parma squamipinnis, Günther, loc. cit., pp. 58 and 505.

? *Glyphidodon australis*, Steindachner, Sitzb. Akad. Wiss. Wien, lvi., p. 328.

Glyphidodon brownriggii, Waite, Proc. Linn. Soc. N. S. Wales, (2), ix., 1894, p. 219. (not *Chatodon brownriggii*, Bennett).

Loc.—This species is common in Port Jackson and neighbouring waters, whence the examples studied and figured were taken. Mr. Woodward's specimens were obtained at Houtman's Abrolhos.

PSEUDOLABRUS PUNCTULATUS, Günther.

Labrichthys punctulata, Günther, Cat. Fish. Brit. Mus., iv., 1862, p. 118.

(Plate xiii.)

Mr. Woodward forwards specimens of this species from Mandurah; Castelnau¹² recorded it from the Western State and the Australian Museum possesses examples taken in South Australian waters.

In one specimen, undoubtedly of this species, the pale blue spots cannot be detected, and have indeed almost faded from all. In the absence of more stable points of difference we may assume that Castelnau's *Labrichthys edelensis*¹³, as he himself hinted, represents an example so faded.

The root of this latter specific name is used several times by Castelnau in his paper on the Fishes of Western Australia. His genus *Edelia* is rediagnosed by Mr. J. D. Ogilby¹⁴, who writes :—“*Deriv. ign.*” Though I regard a zoological name as a name only, without significance, Mr. Ogilby carefully studies the etymology, but in this instance failed to ascertain the origin of the name.

¹¹ Waite.—Rec. Austr. Mus., v., 1904, p. 169.

¹² Castelnau.—Proc. Zool. Soc. Vict., ii., 1873, p. 138.

¹³ Castelnau.—Loc. cit., p. 137.

¹⁴ Ogilby.—Proc. Linn. Soc. N. S. Wales, xxiv., 1899, p. 176.

In R. H. Major's "Early Voyages to Terra Australis¹⁵," we read :—"It would seem that another of the outward bound ships referred to in the Dutch recital, as visiting the coasts of New Holland, was commanded by Edel, and the land there discovered, which was on the west coast, was named the land of Edel. From Campbell's edition of Harris's voyages we learn that this discovery was made in 1619."

PSEUDOLABRUS TETRICUS, *Richardson.*

Labrus tetricus, Richardson, Proc. Zool. Soc., 1840, p. 25 ;
Voy. "Ereb. and Terr.", Fishes, 1848, p. 126, pl. lv., fig. 1.
Labrichthys bostockii, Castlenau, Proc. Zool. Soc. Vict., ii., 1873,
p. 137.

The examples forwarded from Mandurah are unquestionably identical with that described by Castlenau. The lower caudal ray is long equally with the upper one, and though I do not find that the vertical fins have the fine blackish edge described by Günther, the black spot at the upper pectoral base is present. In Richardson's figure the ventral is inserted too high on the body so that the distance between its base and that of the pectoral is not sufficiently great. The pectoral is illustrated as having a rounded margin, in our examples it is sinuous, with the upper rays much the longer. As the drawing is structurally incorrect in respect to the ventral, we may doubt its accuracy in respect to the pectoral and caudal also.

PSEUDOLABRUS GUENTHERI, *Bleeker.*

Pseudolabrus guentheri, Bleeker, Versl. Med. Kon. Akad. Weten.,
xiv., 1862, p. 126.
Loc.—Fremantle.

HARPE VULPINA, *Richardson.*

Cossyphus vulpinus, Richardson, Proc. Zool. Soc., 1850, p. 71.
Loc.—Houtman's Abrolhos.

OPHTHALMOLEPIS LINEOLATUS, *Cuvier & Valenciennes.*

Julis lineolatus, Cuvier and Valenciennes, Hist. Nat. Poiss., xiii.,
1839, p. 436.
Loc.—Houtman's Abrolhos.

¹⁵ Major.—Early Voy. to Terra Austr., 1859, p. lxxxvi.

ODAX RICHARDSONII, *Günther*.

Odax pullus, Cuvier and Valenciennes, Hist. Nat. Poiss., xiv., 1839, p. 304, pl. ccccviii. (not *Forster*).

Julis ? dringii, Richardson, Icon. Pisc., 1843, p. 6, pl. iii., fig. 1.

Odax richardsonii, Günther, Cat. Fish. Brit. Mus., iv., 1862, p. 241.

I have previously recorded this species from Western Australia; the examples now in hand were taken off Houtman's Abrolhos. It may be pointed out that those authors, who, would accept a drawing as the basis of a description, should use Richardson's name *Odax dringii* in preference to the later one of *Günther*.

The drawing is very defective and led Richardson, against his better judgment, to ascribe the fish to the genus *Julis* instead of *Odax*; he was impelled to this course mainly from comparison with a Chinese drawing!

OLISTHOPS CYANOMELAS, *Richardson*.

Olisthops cyanomelas, Richardson, Ann. Mag. Nat. Hist., (2), vii., 1851, p. 291.

Loc.—Houtman's Abrolhos.

HETEROSCARUS FILAMENTOSUS, *Castelnau*.

Heteroscarus filamentosus, Castelnau, Proc. Zool. Soc. Vict., i., 1872, p. 245.

Loc.—Houtman's Abrolhos.

CARANX SPECIOSUS, *Forsk.*

Scomber speciosus, Forskal, Descr. Anim., 1775, p. 54.

Loc.—Fremantle.

CARANX ARMATUS, *Forsk.*

Sciæna armata, Forskal, Descr. Anim., 1775, p. 53.

Loc.—Fremantle.

TRACHINOTUS BAILLONII, *Lacépède*.

Casiomorus baillonii, Lacépède, Hist. Nat. Poiss., iii., 1802, p. 93, pl. iii., fig. 1.

Loc.—Mandurah.

BRAMICHTHYS, *gen. nov.**Family BRAMIDÆ.*

Body ovate, compressed, covered with moderate cycloid scales, lateral line present, complete. Mouth wide, oblique; the lower jaw the longer; a band of minute teeth, scarcely perceptible to the touch, in each jaw, teeth also present on the vomer, palatines and tongue. No œsophageal teeth. Maxillary broad, scaly. Opercle with two flat points, preopercle entire. Snout broad, head not declivous, supraoccipital crest well developed, but not extending forward beyond the eyes.

Dorsal and anal fins long, the anterior lobes elevated and falcate, the first spine of the former, behind the vertical of the ventral fin. The dorsal fin has five spines and about twenty-nine rays, the anal three (? or four) spines and about thirty rays. In both fins the spines are closely adnate to the respective rays. The ventrals are small, placed below the base of the pectorals, with one spine and five rays. The pectorals are placed in the lower half of the body. The vertical fins densely clothed with small scales. Branchiostegals seven, caudal peduncle of moderate depth, not slender.

BRAMICHTHYS WOODWARDI, *sp. nov.*

(Plate xiv.)

D. v. 29; A. iii. (? iv.) 30; V. i. 5; P. 16; C. 17 + 6. L. lat. 50,
L. tr. 7/20.

Length of head 3.3; height of body at the origin of the dorsal fin 1.85 in the total; eye very large, its diameter half the length of the head; snout short 5.1; and length of caudal 5.4 in the same. Interorbital space very convex, twice the length of the snout. Opercular margins smooth. Lower profile slightly more convex than the upper.

The dorsal fin begins well behind the vertical of the opercle, the spines are closely adnate to the soft portion and successively increase in height, the fifth being equal to the diameter of the eye: the anterior rays are much higher, the second being three-fourths more, or 1.25 in the length of head; following the lobed portion the rays are short and the base of the whole fin is slightly more than half the total length. The anal fin is similar in form and length, but occupies a slightly more posterior position: the sequence of the anal spines suggests that one, the second, has been lost, the third existing spine is of the same length as the fifth dorsal. The ventrals are short and do not reach the anal; the spine is a little longer than half the diameter of the eye.

The pectoral is falcate, its third and fourth upper rays a little less than the head in length. The caudal fin is deeply cleft but not forked as in *Brama*, the peduncle is relatively deep being but little less than the diameter of the large eye.

Scales.—The scales are simply cycloid, those above the lateral line arranged obliquely upwards. The lateral line commences with a strong curve to beneath the dorsal spines, whence, it runs almost straight to the end of the caudal rays.

Colours.—The colour appears to have been silvery, the fins are dark brown, without markings.

The general habit of this species suggests that it is an inhabitant of somewhat deep water.

I have pleasure in associating with this interesting fish, the name of Mr. Bernard H. Woodward, Curator of the Western Australian Museum.

Length 172 mm.

Loc.—One example from Mandurah.

PARALICHTHYS MUELLERI, *Klunzinger*.

Pseudorhombus mülleri, Klunzinger, Arch. für Naturg., 1872, p. 40; Sitzb. Akad. Wiss. Wien, lxxx., 1879, p. 407, pl. ix., fig. 2.

Very little colour appears to be developed in this species, but as most of the scales are lost in the two examples forwarded, precise information is not available. A dark spot, probably an ocellus, is present on the lateral line at the beginning of the last third of the body. The figure quoted, represents either a dextral example, or was reversed in drawing. The specimens were trawled between Fremantle and Houtman's Abrolhos.

CYNOGLOSSUS BROADHURSTI, *sp. nov.*

(Plate viii., fig. 2.)

D. 107; A. 86; C. 10; L. lat. 88; L. tr. *inter* L. lat. 13.

Length of head 5.77; depth of body 3.9 in the total length; diameter of eye 8.2; and length of snout 3.0 in the head.

The eyes are situated about half a diameter apart, the upper being a little in advance of the lower. One nostril is placed between the eyes, the other in front of the lower eye. Mouth strongly curved, its angle in advance of the middle of the head, reaching to below the centre of the lower eye. Lips not fringed. Rostral hook very short. Opercle oblique, notched behind.

Teeth.—Minute, present on the blind side only.

Scales.—On the left side strongly ctenoid, each scale with from three to five spines; scales on the blind side cycloid. Two lateral lines on the left side, the lower passes from the snout, above the eye, to the tip of the caudal. There are eighty-eight pierced scales along this line, posterior to the preopercle. The upper lateral line commences on the rostral hook and follows the profile of the head to the dorsal edge which it skirts to the base of the hundred and first ray, and it traverses the space between this and the next one. A vertical line of pores connects the upper and lower lateral lines and is continued round the margin of the preopercle whence a branch is given off at its angle to the opercle. One lateral line only on the blind side.

There is a single ventral fin only and the pectorals are obsolete. The dorsal fin commences on the front margin of the head and is confluent with the caudal, as is also the anal.

Colour.—Uniform brown, without markings.

Five examples received, the largest of which measures 270 mm. in length.

Structurally this species appears to be nearest allied to *C. borneensis*, Günther, differing in the proportions of the head and body, also in the absence of markings.

This is the only species of the genus *Cynoglossus*, as restricted, so far found in Australian waters, and with it I connect the name of Mr. F. C. Broadhurst who was jointly instrumental in procuring the collection of fishes dealt with in this paper.

Loc.—All were taken in the trawl off Carnarvon to the northward of Houtman's Abrolhos.

SYNANCIDIUM HORRIDUM, *Linnaeus*.

Scorpaena horrida, Linnaeus, Syst. Nat., ed. xii., 1766, p. 453.

Loc.—Houtman's Abrolhos.

NEOSEBASTES PANDA, *Richardson*.

Scorpaena panda, Richardson, Ann. Mag. Nat. Hist., ix., 1842, p. 216.

Loc.—Houtman's Abrolhos.

PTERYGOTRIGLA POLYOMMATA, *Richardson*

Trigla polyommata, Richardson, Proc. Zool. Soc., 1839, p. 96.

Loc.—Fremantle.

CHELIDONICHTHYS KUMU, *Lesson & Garnot*.

Trigla kumu, Lesson and Garnot, Voy. "Coquille," 1830, pl. xix.

Loc.—Houtman's Abrolhos ; Fremantle.

PARAPERCIS NEBULOSUS, *Quoy & Gaimard*.

Percis nebulosus, Quoy and Gaimard, Voy. "Uranie et Physicienne," 1825, p. 349.

Loc.—Mandurah.

PATÆCUS FRONTO, *Richardson*.

Patæcus fronto, Richardson, Ann. Mag. Nat. Hist., xiv., 1844, p. 280.

Some remarks on the synonymy of this species will be found under the heading of *P. maculatus*.

Loc.—The example forwarded was trawled between Fremantle and Houtman's Abrolhos.

PATÆCUS MACULATUS, *Günther*.

Patæcus maculatus, Günther, Cat. Fish. Brit. Mus., iii., 1861, p. 292.

(Plate xv.)

The specimen forwarded was obtained at Fremantle, the type locality, and agrees quite well with the original description, differing in fact, as far as ascertainable, only by having thirty-two in place of thirty-one dorsal rays, of which twenty are spinous ; the first is extremely short, in front of the base of the second spine, and the third is longest.

The caudal has nine rays, the lower of which are shorter and thicker than the upper ones.

The tubercle described as being midway between the eye and the end of the snout is perforate and constitutes the posterior nostril, the anterior one lies in another smooth area nearer the mouth.

A Tasmanian example further differs by having thirty-three dorsal spines and especially in the length of the pectoral fin, which is longer than in the Western Australian fish, and almost as long as the head. The body also is relatively deeper ; these slight variations may be of individual or local import only. In neither specimen can I trace the lateral line described ; a non-porous ridge is possibly referred to. The Western Australian specimen is here figured natural size : its total length being 184 mm. It is thus much larger than either the type (80 mm.) or Castelnau's specimen (90 mm.).

Steindachner¹⁵ identified a specimen from St. Vincent's gulf with *Pataecus maculatus*, but evidently misunderstood the sentence:—"The dorsal fin is perfectly continuous, extending from the snout to the middle of the caudal fin."

In his example, as figured, the dorsal is free from the caudal fin and is attached to the middle of the slender peduncle. To emphasise this peculiarity he proposed the sub-genus *Neopataecus*.

This author placed *P. waterhousii*, Castelnau¹⁶, as a synonym of *P. maculatus*, but judging by the radial formula and the condition of the caudal rays, it is equally distinct from that species but identical with Steindachner's example. As the generic name *Neopataecus* was nominally founded on *P. maculatus*, though actually on a specimen of another species, it may, without violation of zoological nomenclature, accompany the latter, the name of which would therefore be *Neopataecus waterhousii*, Castelnau.

In 1890 Mr. R. M. Johnston published a complete list of Tasmanian Fishes, and included *Pataecus armatus*, Günther; I have not, so far, found any other reference to this species, and am inclined to regard it as a manuscript name, or, seeing that we have an example of *P. maculatus* from Tasmania as a *lapsus calami* for that name. Some further confusion in respect to the species of this genus is apparent. Richardson described *P. fronto*, the type, as exhibiting the dorsal formula 24/16. Günther, by error, prints thirty instead of forty, and appears to have been himself misled thereby, for he describes as a new species *P. subocellatus* from South Australia. A careful comparison fails to reveal any essential differences between the two, such being reducible to a variation of one dorsal and one anal ray.

Macleay¹⁷ perceived that an error had been made, but failed to elucidate the difficulty. Of *P. maculatus* he writes:—"Dr. Günther's description of this fish cannot be accurate, or its resemblance to *fronto* must be very slight. It will probably be found that for D. 31 we should read D. 41."

An obvious misprint in Richardson's description "A. 11/15." is corrected by Macleay to "A. 11/5."

The following represents my conception of the synonymy as far as I am in a position to read it. Not having access to the *Anzeiger Akad. Wiss. Wien.*, I am unaware if *Neopataecus* was first characterised there or in the *Sitzungsberichte*.

¹⁵ Steindachner.—Sitzb. K. Akad. Wiss. Wien, lxxxviii., 1884, p. 1087. pl. vii., fig. 3.

¹⁶ Castelnau.—Proc. Zool. Soc. Vict., i., 1872, p. 244.

¹⁷ Macleay.—Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 31.

PATÆCUS, *Richardson*, 1844.

Ann. Mag. Nat. Hist., xiv., 1844, p. 280.

1. *P. fronto*, Richardson, *loc. cit.*, and Voy. "Ereb. & Terr.", Ichth., 1845, p. 20, pl. xiii.; Günther, Cat. Fish. Brit. Mus., iii., 1861, p. 292, and Study of Fishes, 1880, fig. 227; Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 30.
P. subocellatus, Günther, Proc. Zool. Soc., 1871, p. 665, pl. lxiv.; Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 31.
2. *P. maculata*, Günther, Cat. Fish. Brit. Mus., iii., 1861, p. 292; Castelnau, Proc. Linn. Soc. N. S. Wales, ii., 1878, p. 231; Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 31; Waite, *ante* p. 75, pl. xv.
? *P. armatus*, Günther (*fide* Johnston), Proc. Roy. Soc. Tasm., 1890 (1891), p. 33.
3. *P. vincentii*, Steindachner, Anz. K. Akad. Wiss. Wien, 1883, p. 195, and Sitzb. K. Akad. Wiss. Wien, lxxxviii., 1884, p. 1085, pl. vii., fig. 2.

NEOPATÆCUS, *Steindachner*, 1883.

? Anz. K. Akad. Wiss. Wien, 1883.

4. *N. waterhousii*, Castelnau, Proc. Zool. Soc. Vict., i., 1872, p. 244
Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 31.
P. maculatus, Steindachner (not Günther), *loc. cit.* & Sitzb. K. Akad. Wiss. Wien, lxxxviii., 1884, p. 1087, pl. vii., fig. 3.

DIPULUS, *gen. nov.**Family* BROTULIDÆ.

General habit of *Gobioides*. Body greatly elongate, compressed behind, naked. Head small, naked, not spinose, no external eyes; mouth small, slightly oblique, no barbels, jaws equal; teeth small in bands, present in both jaws, on the vomer and palatines. Large pores in front of the snout and lower jaws, surrounded by folds of membrane probably tactile. Branchiostegals six, no pseudobranchiæ. Gill membranes wide, united, not free from the isthmus. Dorsal and anal fins low, not differentiated from the caudal. Pectorals normal; ventrals small, close together each an undivided filament near to the humeral symphysis. Vent a transverse opening approaching the middle of the body. Urogenital orifice with distinct external opening, bounded by very large transverse labia, at least in the male.

This genus appears to be nearest allied to *Aphyonus*, Günther¹⁸, and *Sciadonus*, Garman¹⁹. From the former it is immediately distinguishable by its elongate form, complete dentition and united gill-membranes; the latter character and, among others, the non-pedicilate pectoral serve to separate it from *Sciadonus*.

¹⁸ Günther.—Ann. Mag. Nat. Hist., (5), ii., 1878, p. 22.

¹⁹ Garman.—Mem. Mus. Comp. Zool. Harvard, xxiv., 1899, p. 171.

DIPULUS CÆCUS, sp. nov.

(Plate xi., fig. 2.)

Length of head 8·3 in the total, its depth equal to that of the body, or 1·7 in its length. The width of the head is slightly more than its depth and much greater than the thickness of the body.

The snout is very tumid, its anterior profile almost vertical; in company with the front portion of both upper and lower jaws it bears a number of large pores, surrounded by folds and flaps of membrane (see fig. 2a).

Simple pores are, in addition, present on other parts of the head, notably a pair above the expanded end of the maxilla, and a series at long intervals along the rami of the mandible. The posterior nostrils are very evident, situated near the end of the snout, and have a supero-lateral aspect, the anterior ones, which may not be distinguished from the pores referred to, appear to be placed on the front aspect of the snout within the dermal folds. Eye not visible. The orbit, as ascertained through the skin, lies wholly within the anterior third of the head, its diameter being half the length of the snout.

Teeth.—The teeth are very small and sharply pointed, and are present in bands in both jaws, on the vomer and palatines.

The maxilla is greatly broadened behind, and extends to far beyond the hinder margin of the orbit.

Fins.—The dorsal fin begins behind the base of the pectoral, its distance from the snout less than one-sixth of the total length, caudal excluded. Origin of anal nearer to the snout than to the base of the caudal. Pectoral normal, less than half the length of the head. The ventrals consist each of a simple ray placed close together, in advance of the pectoral, they are very short, equalling the snout in length. Vent situated far behind the head, its distance therefrom three-fourths the post-ventral length. It is quite distinct from the uro-genital orifice, which is bordered before and behind with very large labia. Immediately within the anterior lip is a pair of large leaf-like appendages at the base of which lies the penis.

The folds and flaps of membrane surrounding the pores on the snout and mandible recall the condition in some of the leaf-nosed Bats. The analogy may indeed be very close: the fish is blind and the *Rhinolophidæ* hunt in the dark.

“In their habits they appear to differ from other insectivorous Bats without nasal appendages, inhabiting the same regions, by coming out later in the evening, or when the sun has completely gone down below the horizon. This peculiarity is probably connected with their possession

of special organs of touch in the complicated nose-leaf, and delicately formed ears and membranes, which may permit them to commence and continue their hunt for insect prey at a time when other Bats have retired to their sleeping-places."²⁰

The large size of the genitalia and the development of special organs in this fish, indicates that copulation actually takes place, a circumstance also distinctly correlated with blindness.

Loc.—The single specimen forwarded is a male, 152 mm. in length, and was taken off Fremantle.

MONACANTHUS CHINENSIS, Bloch.

Balistes chinensis, Bloch, Ichty., ii., 1787, p. 29, pl. lii., fig. 1.

Loc.—Fremantle.

MONACANTHUS MEGALOURUS, Richardson.

Monacanthus megalourus, Richardson, Icon. Pisc., 1843, p. 5, pl. i., fig. 3.

Loc.—Houtman's Abrolhos.

PSEUDOMONACANTHUS GALII, *sp. nov.*

(Plate xvi.)

Length of head 3·2; height of body at the first anal ray 2·8; and length of caudal 5·1 in the total. The eye is almost round and lies midway between the end of the snout and the first dorsal ray; its diameter is one-fifth the length of the head; the interorbital space is convex and contained 4·1 times in the same.

The gill opening is oblique and placed immediately beneath the eye, it is distant therefrom about the diameter of the orbit. The nostrils are situated in a shallow depression half a diameter in advance of the eye, each in a short cutaneous tube.

The head is deeper than long, a little concave on the snout, slightly tumid above the eye; the lower profile is moderately straight to the pelvic spine.

The dorsal spine is placed above the last third of the orbit, and nearer to the rays than the end of the snout, it is without distinct barbs, the front and sides being granular; its length approaches half that of the head. The rays are highest medially, the longest being one-fourth the length of the head. The anal arises beneath the sixth dorsal ray and is continued posteriorly beyond that fin to which it is similar in form, but its rays are not quite so high.

²⁰ Dobson.—Cat. Chiroptera Brit. Mus., 1878, p. 100.

The ventral process is but little extensible, and its spine is small and granular. The pectoral is rounded and its third ray is one-fifth longer than the eye. The caudal is short and rounded, the peduncle is stout, its height being half the length of the fin.

The whole of the head and body, the bases of the vertical fins and the outer aspect of the alternate caudal rays uniformly covered with small bifurcated spines, so densely placed as to give a velvety feel to the touch.

Colours.—The colours are not well preserved, but as far as ascertainable are as follows:—Uniformly dark brown, the body marked with narrow longitudinal black lines about as wide as or narrower than the interspaces. Immediately behind the head they are about twelve in number but are successively lost posteriorly and none attain to the caudal peduncle, the head and lower fourth of the body, except in the region of the pelvic spine, are without markings. Fins pale brown.

Total length 300 mm. Taken at Sharks Bay.

At the request of Mr. Woodward, this fish is named after Mr. C. F. Gale, Chief Inspector of Fisheries, Western Australia.

PSEUDOMONACANTHUS HIPPOCREPIS, Quoy & Gaimard.

Balistes hippocrepis, Quoy and Gaimard, Voy. "Uranie et Physicienne," 1824, p. 212.

Loc.—Mandurah; Fremantle; Houtman's Abrolhos; Rottnest Island.

PSEUDOMONACANTHUS GRANULATUS, Shaw.

Balistes granulatus, Shaw, in White's Voy. N. S. Wales, 1790, p. 295, fig. 2.

Loc.—Mandurah; Fremantle; Houtman's Abrolhos.

PSEUDOMONACANTHUS BROWNII, Richardson.

Aleuterius brownii, Richardson, Voy. "Ereb and Terr.", Ichth., 1846, p. 68.

Loc.—Fremantle.

CHÆTODERMIS PENICILLIGERUS, Cuvier.

Balistes penicilligerus, Cuvier, Règne Anim., ed. 2., ii, 1829, p. 374 (footnote), and iii., 1830. p. 433, pl xi., fig. 3.

Castelnau²¹ recorded this species from Fremantle, whence we have a fine example measuring 27 mm.

Mr. C. T. Regan²² does not admit *Chætodermis* as a valid genus and remarks on the similarity of the species to *Monacanthus tomentosus*.

CHÆTODERMIS MACCULLOCHI, *sp. nov.*

(Pl. xvii.)

D. ii., 27 ; A. 26 ; P. 12 ; C. 12.

Length of head 2·7 ; height of body at the vent, equal to the length of the caudal and 2·2 in the total. The eye lies nearer to the dorsal rays than to the end of the snout and is 4·4 in the length of the head : the interorbital space is 4·0 in the same.

The gill opening is nearly vertical, it is placed beneath the posterior margin of the eye, and is nearly one-half longer than its diameter. The nostrils are simple pores placed close together in a naked area well in front of the eye.

Head deeper than long, its upper and lower profiles, to the dorsal and ventral spines respectively, perfectly straight.

The body is elongate, strongly compressed, its upper and lower borders very slightly curved. The dorsal spine is placed wholly behind the eye and midway between the end of the snout and the middle dorsal rays. It is beset with strong lateral barbs, directed downward ; at the upper base of each arises a filament as long as the diameter of the eye and bifid near the tip. The rays are long and rise gradually to about the twentieth which is half the length of the head ; the posterior edge is gently rounded. The anal arises beneath the seventh dorsal ray and extends a little beyond its posterior insertion, it is otherwise quite similar. The ventral process is scarcely depressible but its terminal spine is movable. It is beset with barbs and filaments. The pectoral is rounded, its longest rays twice the diameter of the eye. The caudal is markedly acuminate, the central rays being twice the length of the outer ones. It is peculiar inasmuch as its rays are homacanthus (if I may use the term in this connection) there being no alternation of arrangement and all of equal thickness ; the peduncle is flattened above and below, and its depth is equal to the diameter of the eye.

The lips, space around the nostrils and gill-openings are naked, otherwise the head is densely covered with rosette-like

²¹ Castelnau.—Proc. Zool. Soc. Vict., ii., 1873, p. 147.

²² Regan.—Proc. Zool. Soc., 1902, p. 289.

scales. On the body they merge into simple prominent sub-recumbent spines arranged in close longitudinal rows, which extend to the bases of the caudal rays. The head and body bear distant branched filaments, there is a series along the upper and lower profile of the head and a close series between the ventral spine and the anal fin.

Total length 230 mm.

Loc.—Houtman's Abrolhos.

Colours.—The specimen is evidently much discoloured and is now uniform pale brown, with scattered dark markings, principally disposed below the base of the dorsal rays. A larger spot may be traced above the upper pectoral rays. The caudal bears a few dark spots.

The contour of this fish sufficiently distinguishes it from that of the only other known species. It has the shape of a double-rhomboid, one figure of which is formed by the head and body and the other by the tail. The hinder profiles of the body produce an acute angle, whereas in *C. penicilligerus*, Cuvier, they form a semicircle; the tail of the latter, also, is not produced as in the new species.

I associate with the species the name of Mr. A. R. McCulloch to whom I owe the figure of this and the other species illustrating the paper.

ARACANA LENTICULARIS, *Richardson*.

Ostracion lenticularis, Richardson, Proc. Zool. Soc., 1841, p. 21.

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