

As the present species appears to be distinct from *M. meandrina*,\* and does not appear to be identifiable with any of the strictly fossil species, I propose for it the name of *M. repens* in reference to its creeping habit.

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NOTE ON A SPECIMEN OF MALFORMED *Cypræa*.

BY J. BRAZIER, C.M.Z.S., &C.

*Cypræa poraria*.

Back very dark purple (destitute of the white dots and brown rings that are to be found in the typical form), base and the sides purple violet the inner and outer lips excavated very deep at each end, wide apart, produced in the middle; the teeth white, eighteen on the outer lip, extending nearly across to the margin, some short, and others elongated; fourteen on the columella side thickened and rounded at each end, aperture shaped like the figure eight.

This specimen was found by Mr. R. C. Rossiter, on the reefs at the Island of Ouen, New Caledonia. Length 12. Alt. 7. breadth 9 lines.

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DESCRIPTIVE CATALOGUE OF THE FISHES OF AUSTRALIA.

BY WILLIAM MACLEAY, F.L.S., &C.

Part IV.

ORDER IV. *PHYSOSTOMI*.

*All the fin rays are articulated; only the first of the dorsal and pectoral fins is sometimes more or less ossified. The ventral fins, if present are abdominal, without spine. Air-bladder, if present, with a pneumatic duct.*

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\* In general habitat it resembles *Reticulipora dorsalis*, of Waters; but the form of the cells sufficiently distinguishes it.

## FAMILY I. SILURIDÆ.

Skin naked or with osseous scutes, but without scales. Barbels always present; maxillary bone rudimentary, almost always forming the base of a maxillary barbel. Margin of the upper jaw formed by the intermaxillaries only. Suboperculum absent. Air-bladder generally present, communicating with the organ of hearing by means of the auditory ossicles. Adipose fin absent or present.

Genus *Plotosus*, Lacep.

A short dorsal fin in front, with a pungent spine; a second long dorsal is united with the caudal and anal into one fin, which is pointed behind. Teeth in the upper jaw conical, on the vomer molar-like, in the lower jaw mixed. Barbels eight: one immediately before the posterior nostril, which is distant from the anterior, the latter being quite in front of the snout. Cleft of mouth transverse. Eyes small. The gill membranes are separate from each other, not attached to the isthmus. Branchial arches without particular cartilaginous posterior process and without posterior membrane. Ventral fins many-rayed. Head depressed.

Coasts of Indian and Polynesian Seas.

802. *PLOTOSUS ANGUILLARIS*, Lacep.

Gunth., Cat. Fishes, V., p. 24.—Cant. Fishes Mal., p. 264.

*Plotosus arab*, Bleek., Atl. Ichth. Silur., p. 98, tab. 95, fig. 2.

B. 12. First D. 1/4-5. Second D.+C.+A. 169-189. P. 1/11.

V. 12. Vert. 12/35.

The length of the head is about one-fifth of the total length (without the caudal fin), the height of the body one-seventh or one-eighth. Barbels not very long: those of the nostril extend to the eye, and those of the maxillary are about half as long as the head. Brown or black, generally with two white longitudinal



bands, the upper of which commences at the snout, and runs above the eye along the base of the dorsal fin; the lower proceeds from the maxillary barbel along the middle of the side of the body. Vertical fins with dark margin.

Moreton Bay, Endeavour River, and Port Darwin.

803. *PLOTOSUS UNICOLOR*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 141.

Eight barbels, about as long as half the space from the anterior margin of the snout to the base of the first dorsal fin, those of the nostrils extending considerably behind the eye; length of head over four times and two thirds in the total length, height of body over six times in the same; the diameter of the eye less than half the length of the snout. Head rather pointed in front, the dorsal spine straight and acute; rays of first dorsal, four. Ventrals rather long, of twelve rays; pectorals of one long spine and nine rays. Colour uniform dark brown, almost black. Length about seven inches.

In waterholes in the interior of Western Australia.

804. *PLOTOSUS ELONGATUS*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 237.

Brisbane River (fresh-water) Norman River.

Genus *NEOPLOTOSUS*, Casteln.

All the characters of *Plotosus*, but with the teeth all similar; soft, molar-like, they form a strip on the palate and a band on the vomer.

Australia.

805. *NEOPLOTOSUS WATERHOUSEI*, Casteln.

Researches on the Fishes of Australia, p. 45.

First D.  $1/3$ . Second D.+C.+A. 140. P.  $1/10$ . V. 10.

The height of the body is contained eight times and one-third in the total length, the length of the head five times; barbels not very long; those of the nostrils extend to the eyes; those of the maxillary not further; the highest of the mandibular barbels is the longest, being about as long as the snout, the lower shorter. Eye very small, its diameter about one-eighth of the length of the head and one-third of that of the snout. The snout is depressed; the body is compressed, elongate, and tapers to the tail. General colour (in spirits) light grey, with the lower parts yellow; the fins yellowish, bordered with black; a few small irregular spots on the body and dorsal fin.

Adelaide. Length five inches.

#### Genus COPIDOGLANIS, Gunth.

A short dorsal fin in front, with a pungent spine; a second long dorsal is united with the caudal and anal into one fin. Teeth in the upper jaw conical, on the vomer molar-like, in the lower jaw mixed. Barbels eight; nostrils as in *Plotosus*. Cleft of the mouth transverse. Eyes of moderate size, with a free orbital margin. The gill-membranes are separated by a deep notch, united anteriorly only, the united portion not attached to the isthmus. The first branchial arch with a fringed membrane along the hinder edge of its concave side. Ventral fins many-rayed. Head rather compressed.

Coasts and rivers of Australia and East Indian Archipelago.

806. COPIDOGLANIS TANDANUS, Mitchell.

Gunth., Cat. Fishes V., p. 26.

“*The Cat Fish*” of the Murrumbidgee.

B. 9. First D. 1/6. Second D.+C.+A. 142. P. 1/10. V. 12.

Head and body compressed; the height of the body is not much less than the length of the head, which is a little more than one-fifth of the total. Head as high as broad, its greatest width

being three-fifths of its length; the diameter of the eye is contained five times and a-half in the length of the head, twice and a-half in that of the snout, and twice in the width of the interorbital space. The nasal barbels are a little shorter than those of the maxillary, and extend to the middle of the eye. The band of teeth of each intermaxillary bone is twice as broad as long; the vomerine teeth are arranged in a semicircular disk, those of the mandibularies form a band which is broadest in the middle; all the teeth of conical form have a brown tip. The first dorsal fin is nearly as high as the body, and its spine more than half as long as the head. Pectoral spine as strong as, but much shorter than that of the dorsal fin. Uniform blackish-brown above.

Rivers of New South Wales. Length from two to three feet.

807. COPIDOGLANIS OBSCURUS, Gunth.

Gunth., Cat. Fishes V., p. 26.

First D.  $1/6$ . Second D.+C.+A. 226. P.  $1/14$ . V. 15-16.

Head not much compressed, but nearly as high as broad, its width being two-thirds of its length. The height of the body is contained eight times and a-half in the total length, the length of the head six times and a-third; the diameter of the eye is one-sixth of the height, two-fifths of that of the snout, and three-fifths of the width of the interorbital space. The nasal barbels extend to behind the eye, those of the maxillary to the gill-opening. Each intermaxillary with a triangular band of teeth, which is rather broader than long; vomerine band crescent-shaped. All the teeth are white. The first dorsal fin is placed immediately behind the nape and is as high as the body, its spine is more than half the length of the head. Pectoral spine as strong as, but much shorter than that of the dorsal fin. Brown: fins with black margin.

Australia ? (Gunther).

## 808. COPIDOGLANIS BREVIDORSALIS, Gunth.

Ann. and Mag. Nat. Hist. 1867, Vol. XX., p. 66.

Differs from the preceding species in having the anterior portion of the second dorsal fin replaced by a pad of fat, from which the rays gradually emerge behind; the anterior portion does not contain any rays. The anal fin is composed of about eighty-five rays. The nasal barbel extends to the origin of the dorsal fin, none of the others reach beyond the extremity of the pectoral. The eye is one-seventh of the length of the head. Entirely black.

Cape York. Nicol Bay. Length six inches.

809. COPIDOGLANIS LONGIFILIS, *n. sp.*

First D. 1/4. Second D.+C.+A. 160. P. 1/11. V. 12.

The height of the body is rather less than one-sixth of the total length, and is less than the length of the head. The body is compressed and tapers to the tail; the head is rather depressed with the eyes on the upper surface; the distance from the eye to the snout is equal to three diameters of the eye, and the width of the interorbital space to two diameters. The lips are extremely verrucose, with two prominent nasal flaps on the upper; the teeth in both jaws and on the roof of the mouth are strong, bluntly conical, and distant. The barbels are very long, the nasal ones reaching to the first dorsal fin. The first dorsal fin is somewhat pointed and more than half the height of the body. The colour seems to have been black or very dark brown.

Long Island, Torres Straits. Length thirteen inches.

## Genus NEOSILURUS, Steind.

A genus distinguished from *Copidoglanis* by the rudimentary condition or entire absence of the anterior part of the second dorsal fin. The *Copidoglanis brevidorsalis*, Gunth., should perhaps be referred to this genus.

810. *NEOSILURUS HYRTLII*, Steind.

Sitzgsber. Ak. Wiss. Wien. 1867, p. 14.

I have never seen Steindachner's description of this species, but I think it very probable that it is identical with a fish which I have received from a river of Northern Queensland, and of which the following is a description.

First D.  $1\frac{1}{4}$ . Second D. + C. + A. 115. P.  $1\frac{1}{9}$ . V. 13.

Body very compressed, its height about equal to the length of the head, and one-fifth of the total length; the diameter of the eye is about one-fifth of the length of the head, is contained twice in the length of the snout, and more than twice in the width of the interorbital space. None of the barbels reach the eye. The second dorsal fin commences about one-fifth of the length of the body from the tail, the rays at first are very short, but lengthen gradually to the middle of the caudal fin which is pointed, the rays of the anal also lengthen gradually to the tail. The colour seems to have been reddish-brown, white beneath.

River of Northern Queensland. Length seven inches.

Genus *CNIDOGLANIS*, Gunth.

A short dorsal fin in front, with a pungent spine; a second long dorsal is united with the caudal and anal into one fin, pointed behind. Teeth in the upper jaw conical, on the vomer molar-like, in the lower jaw mixed. Barbels eight or more; nostrils as in *Plotosus*. Cleft of the mouth transverse. Eyes small. The gill-membranes are united below the throat, and attached to the isthmus along the entire median line. The second and third branchial arches with a series of long cartilaginous processes, covering the base of the gill-laminæ on the sides facing each other. Ventral fins many-rayed.

Rivers and Coasts of Australia.

811. *CNIDOGLANIS MEGASTOMA*, Richards.

Gunth., Cat. Fishes V., p. 27.

*Plotosus megastomus*, Rich., Voy. Erebus and Terror, p. 31, pl. 21, figs 1 and 3.

*Charoplotosus decemfilis*, Kner., Novara, Fisch. p. 300, t. 13, fig. 1.  
B. 11. First D.  $1/4$ . Second D.+C.+A. 234. P.  $1/9$ . V. 10.

Head very broad and depressed, its length being one-fifth of the total (without caudal). Ten barbels, (there being two pair of maxillaries) not very long; those of the nostril and maxillary extending somewhat behind the eye. Lower lip broad, pendent, with lobes, the outer of which is situated below the maxillary barbels and has the appearance of a short barbel. The intermaxillary teeth are small, conical, and form two small patches; those of the lower jaw form a broad band, tapering on the side, the outer series of which is formed by conical teeth, the remainder being molar-like. Vomerine teeth in a large triangular patch. Eye small, covered by the skin. Uniform blackish-brown above.

Port Jackson.

812. CNIDOGLANIS LEPTURUS, Gunth.

Gunth., Cat. Fishes V., p. 28.

First D.  $1/5$ . Second D.+C.+A. 212. P.  $1/9$ . V. 11.

Head depressed, its width being three-fourths of its length, which is one-seventh of the total; tail long, much produced and pointed behind. The nasal and maxillary barbels extend to the end of the head; lower lip not pendent or fringed. Intermaxillary teeth conical, in two small patches; those of the mandible in two triangular bands, molar-like, with an outer series of conical ones. Eye small. The first dorsal fin is lower than the body, and placed at a very short distance from the occiput; its spine is feebly serrated, one-third or not quite one-third as long as the head; pectoral spine as long and strong as that of the dorsal fin. Uniform black.

Port Jackson. Length fourteen inches.

813. *CNIDOGLANIS MICROCEPHALUS*, Richards.

Voy. Erebus and Terror, p. 31, pl. 21, figs. 4-7.—Gunth., Cat. Fishes V., p. 28.

First D.  $1/5$ . Second D.+C.+A. 210. P.  $1/10$ . V. 12.

Head rather depressed, small, its length being one-eighth of the total length. Nasal barbels long, extending to the dorsal fin, which however is placed at a short distance from the occiput. Maxillary barbels reaching the gill-opening; lower lip without fringes. The intermaxillary teeth form two triangular patches, those of the vomer a crescent-shaped band. Eye rather small. The first dorsal fin elevated, and produced into a long point. Brown, with numerous small, round, whitish spots.

North-west Coast of Australia.

814. *CNIDOGLANIS BOSTOCKII*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 140.

This species seems to resemble *C. megastoma* in almost every particular excepting that the nasal barbels are always much shorter, not passing the centre of the eye. The first dorsal fin has five rays; the second dorsal, caudal and anal united about two hundred and twenty rays; and the ventrals ten. Colour in spirits black, becoming browner beneath.

West Australia. Length twenty-one inches.

Genus *SILURICHTHYS*, Bleek.

One very short dorsal fin without pungent spine; no adipose fin; anal and caudal fins confluent. Barbels four; one to each maxillary, and one to each mandible. Palatine teeth none; vomerine teeth in a short transverse band; eyes rather small, above the angle of the mouth. Nostrils remote from each other, subequal in form and width. Head and body covered with soft skin. The upper profile of the head straight. The dorsal fin is



inserted above, or immediately before the ventrals. Ventrals composed of eight or less rays; caudal obliquely emarginate.

East Indian Archipelago. Cashmere.

815. SILURICHTHYS AUSTRALIS, Casteln.

Researches on the Fishes of Australia, p. 45.

The height of the body is contained six times in the length, without the caudal fin, the length of the head four times and three-quarters. Eight barbels,\* those at the corner of the mouth shorter than the others; the upper jaw is longer than the lower; the dorsal is inserted before the vertical from the ventrals. Colour silvery, with the upper parts of a greenish-grey; the entire body and fins covered with numerous and minute black markings.

Cape York. Length four and a-half inches.

Genus CAINOSILURUS.

*Neosilurus*, Castelnau, Proc. Linn. Soc. N.S.W., Vol. II., p. 238.

I substitute this name for *Neosilurus* previously appropriated by Dr. Steindachner.

816. CAINOSILURUS AUSTRALIS, Casteln.

*Neosilurus australis*, Casteln., Proc. Linn. Soc. N.S.W., Vol. II., p. 239.

Freshwater, Rockhampton.

Genus EUMEDA, Casteln.

Proc. Linn. Soc. N.S.W. Vol. III., p. 143.

817. EUMEDA ELONGATA, Casteln.

Proc. Linn. Soc. N.S.W.. Vol. III., p. 144.

Brisbane River. Rockhampton.

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\* This is not in accordance with the characters given of the genus.



Genus *ARIUS*, Bleek.

Adipose fin of moderate length or short ; a short dorsal fin with a pungent spine and seven soft rays ; anal fin rather short. Head osseous above ; barbels six, four at the mandible, no nasal barbels. Teeth on the palate fixed, the upper jaw longer. Eyes with a free orbital margin ; the anterior and posterior nostrils placed close together, the posterior with a valve. Caudal fin forked ; ventral with six rays, attached behind the vertical from the dorsal. Gill-membranes not confluent with the skin of the isthmus, with free posterior margin.

Tropical regions.

818. *ARIUS THALASSINUS*, Rupp.

Gunth., Cat. Fishes V., p. 139.—Bleek., Atl. Ichth. Silur., t. 61.

D. 1/7. A. 16-17. P. 1/11. Vert. 18/27.

The height of the body is contained from four times and three-quarters to five times and two-fifths in the length, (without caudal), the length of the head four times and a-quarter or three and a-half. Head much broader than high ; snout obtuse in young specimens ; the adult fish with the upper jaw pointed, and projecting much beyond the lower. The teeth on the palate are villiform and form a pair of more or less separate subtriangular patches, each of which is composed of three portions. The maxillary barbels extend to the opercles or to the pectoral fin. Crown of the head granulated ; occipital process triangular, rather longer than broad, elevated in its middle into a longitudinal ridge ; the basal bone of the dorsal spine is small, crescent-shaped. Dorsal spine of moderate strength, granulated in front, slightly serrated behind ; its length equals that of the head without snout ; the dorsal rays are as high as the body. Adipose fin very short. Pectoral spine stronger, and but little shorter than the dorsal spines.

Torres Straits. Port Jackson.

819. *ARIUS GAGORIDES*, Cuv. & Val.

Gunth., Cat. Fishes V., p. 140.

D. 1/7. A. 17. P. 1/12.

The height of the body is rather less than one-fourth of the length (without caudal), the length of the head two-sevenths; head much broader than high, its greatest width being equal to the distance of the hinder nostril from the end of the opercle. The teeth on the palate are in two pairs of confluent patches, those on the palatine bones are large, broad, and emarginate posteriorly. Six barbels, shorter than the head. Crown of the head granulated, the granules being arranged in radiating series; occipital plate triangular, elevated into an obtuse ridge along its middle, rather broader than long; the basal bone of the dorsal spine is of moderate width, narrowest in the middle, each half slightly bent into an S-shaped form. Dorsal spine strong, as long as the head without snout, granulated in front, and obtusely serrated behind, as high as the soft portion of the fin, or as the body underneath. Adipose fin somewhat shorter than the dorsal. Pectoral spine as long as that of the dorsal fin, granulated exteriorly and serrated inferiorly. Ventral fins much shorter than the pectoral, not extending to the anal. Caudal fin deeply forked.

Port Darwin.

820. *ARIUS AUSTRALIS*, Gunth.

Gunth., Proc. Zool. Soc., London, 1867, p. 103.

D. 1/7. A. 16-17. P. 1/10.

The height of the body is contained from four times to four times and a-half in the length (without caudal), the length of the head thrice and a-third or thrice and a-fourth; the greatest width of the head is five-sixths of its length. Occipital process as long as, or longer than broad, granulated, with a very obtuse median ridge, extending to the small basal bone of the dorsal fin. Eye

of moderate size, much nearer to the snout than to the extremity of the operculum, the length of the snout being nearly one-half of that of the post-orbital portion of the head; upper jaw somewhat longer than the lower. The teeth on the palate form a broad arched band, the vomerine patches being slightly separated from the palatine, and either perfectly continuous in the middle or but slightly interrupted. The maxillary barbels extend to, or sometimes not quite to, the root of the pectoral fin; the outer ones of the mandible, to the gill-opening. Dorsal spine strong, half as long as the head, slightly serrated in front and behind. Adipose fin as long as, or shorter, than the dorsal, its length being less than one-third of the distance between the two fins. Pectoral spine stronger and a little longer than that of the dorsal fin; ventral fins more or less shorter than the pectorals. Porus axillaris minute. Sides of the body silvery, upper parts uniform blackish.

Hunter River. Richmond River.

821. *ARIUS CURTISII*, Casteln.

Proc. Linn. Soc. N.S.W., Vol. II., p. 236.

Moreton Bay.

822. *ARIUS VENATICUS*, Richards.

*Bagrus venaticus*, Rich., Voy. Erebus and Terror, p. 33.—Gunth. Cat. Fishes V., p. 174.

D. 1/9 or more. A. about 30. P. 1/13. V. about 8.

Head strongly granulated above; apex of the occipital process where it meets the small crescentic buckler of the dorsal fin, slightly rounded. Dorsal spine serrated anteriorly and a little undulated posteriorly; the pectoral spine is equal in length to the dorsal one, and is strongly serrated on both sides. The teeth are villiform. The front of the vomer supports two small roundish dental plates, which adhere to each other. The palatine plates

are both broader and longer, upper lobe of tail longest. Barbels six. (Richards.)

North-west Coast of Australia.

823. *ARIUS VERTAGUS*, Richards.

Voy. Ereb. and Terr., Fish., p. 33.—Gunth., Cat. Fishes V., p. 174.

B. 6. D. 1/6-7. A. 28. P. 1/9. V. 9?.

The dorsal spine is equal in length to the space between its base and the orbit, and is shorter than the pectoral spine, which is strongly serrated on both sides. Head granulated above, with the occipital process crescentic at the apex. The vomerine teeth are disposed in two small separate plates, and the palatine teeth form a still smaller plate near each corner of the mouth. Barbels six. Length three inches.

North-west Coast of Australia.

The last two species were described by Sir John Richardson from very imperfect specimens.

FAMILY II. HAPLOCHITONIDÆ.

Body naked or scaly. Margin of the upper jaw formed by the intermaxillary; opercular apparatus complete. Barbels none. Gill-opening wide; pseudobranchiæ well developed. Air-bladder simple. Adipose fin present. Ovaries laminated; the eggs fall into the cavity of the abdomen, there being no oviduct. Pyloric appendages none.

GENUS *PROTOTROCTES*, Gunth.

General habit of *Corregonus*. The scales on the front part of the body irregularly arranged in series descending obliquely forward. The dorsal fin occupies a position somewhat posterior to that of the ventrals, which are in the middle of the length of the body, and composed of seven rays. Adipose fin, small; caudal emarginate; anal of moderate length. Eye of moderate

size. Teeth minute, in a single series in the jaws, on the vomer and on the palatine bones. Gill-openings rather wide, the gill-membranes not attached to the isthmus. Branchiostegals six.

Australian Rivers.

824. *PROTOTROCTES MARĒNA*, Gunth.

Gunth., Cat. Fishes V., p. 382. "*The Yarra Herring.*"

B. 6. D. 10. A. 19. P. 13. V. L. lat. 78. L. transv. 19.

Body compressed, the height about one-fourth of the length (without caudal); the belly strongly compressed, the scales on one side not extending to the other, leaving a naked groove from the ventrals to the anal. Head small, terminating in a conical snout, with the upper jaw longest; the snout rather longer than the diameter of the eye, which is one-fourth of the length of the head, and equal to the width of the convex interorbital space. The cleft of the mouth extends to below the anterior margin of the orbit; the maxillary and intermaxillary are very solid bones, firmly adherent to one another and extending equally far backwards. A single series of minute teeth on the intermaxillary, vomer, and palatine bones. The cheek and opercular apparatus are naked. Operculum quadrangular. The dorsal fin midway between the oral and caudal extremities; caudal emarginate; the pectorals are rather longer than the ventrals. Scales moderate, irregular, thin and cycloid; no lateral line. Greenish-olive; sides and belly silvery. Length ten inches.

Rivers of Victoria and Tasmania.

FAMILY III. SCOPELIDÆ.

Body naked or scaly. Margin of the upper jaw formed by the intermaxillary only; opercular apparatus sometimes incompletely developed. Barbels none. Gill-openings very wide; pseudobranchiæ well developed. Air-bladder none. Adipose fin present. The eggs are enclosed in the sacs of the ovarium

and excluded by oviducts. Pyloric appendages few in number or absent. Intestinal tract very short.

Genus SAURUS, Cuv. & Val.

Body sub-cylindrical, rather elongate, covered with scales of moderate size; head oblong; cleft of the mouth very wide; intermaxillary very long, styliform, tapering; maxillary thin, long, closely adherent to the intermaxillary. Teeth cardiform, some being elongate, slender; all can be laid downwards and inwards; teeth in the jaws, on the tongue, and on the palatine bones, those on the palate form a single band on each side. Eye of moderate size. Pectoral fin short; ventral eight-rayed, the inner rays much longer than the outer; it is inserted before the dorsal, and not far behind the pectorals. The dorsal fin is situated nearly in the middle of the length of the body, with thirteen or less rays; adipose fin small; anal short or of moderate length; caudal forked. Gill-opening very wide, the gill-membranes not attached to the isthmus; branchiostegals numerous. Pyloric appendages few in number.

Tropical parts of the Atlantic and Pacific. Mediterranean.

825. SAURUS MYOPS, Cuv. & Val.

Gunth., Cat. Fishes V., p. 398.—Bleek., Atl. Ichth. Saurid., tab. 2., fig. 3.

B. 16. D. 12. A. 15-16. L lat. 56-58. L. transv.  $3\frac{1}{2}/7$ .

The length of the head is two-sevenths of the total length (without caudal); crown of the head and occiput finely corrugated; interorbital space deeply concave. Snout rather obtuse, short, shorter than the eye, with the lower jaw a little projecting beyond the upper. Dorsal fin as high as long; the pectoral extends to the tenth scale of the lateral line; the ventral to, or nearly to, the vent. Tail compressed. Scapula black.

Port Jackson.

## Genus SAURIDA, Cuv. &amp; Val.

This genus differs from *Saurus* only in having a double band of teeth on the palatine bones on each side, the inner band being the shorter, and in having the ventrals nine-rayed, the inner rays not much longer than the outer ones.

Indian Ocean and Western Pacific.

## 826. SAURIDA NEBULOSA, Cuv. &amp; Val.

Gunth., Cat. Fishes V., p. 399.—Bleek., Atl. Ichth. Saurid. tab. 2, fig. 1.

B. 13. D. 11. A. 9. V. 9. L. lat. 52. L. transv.  $3\frac{1}{2}/6$ .

Snout somewhat pointed; orbit with the adipose eyelids moderately developed. The pectoral fin extends to the ninth scale of the lateral line. A rather inconspicuous ridge along the caudal portion of the lateral line. Dorsal and caudal fins with brownish-black dots; the brown spots on the side of the body extend to below the lateral line.

Port Jackson.

## 827. SAURIDA UNDOSQUAMIS, Richards.

Voy. Erebus and Terror, p. 138, pl. 51, f. 1-6.—Gunth., Cat. Fishes V., p. 400.

B. 15. D. 11. A. 11. V. 9. L. lat. 57-58. L. transv.  $4\frac{1}{2}/7$ .

Snout broad and obtuse; orbit with the adipose eyelids moderately developed. The pectoral fin extends to the eleventh scale of the lateral line, and nearly to the vertical from the origin of the dorsal fin. A conspicuous ridge along the caudal portion of the lateral line. A series of small brown spots on the upper caudal ray.

North-west Coast of Australia.

## 828. SAURIDA AUSTRALIS, Casteln.

Proc. Linn. Soc. N.S.W., Vol. III., p. 393.

Port Jackson.



## 829. SAURIDA GRANDISQUAMIS, Gunth.

Gunth., Cat. Fishes V., p. 400.

B. 15. D. 12-13. A. 11. V. 9. L. lat. 49. L. transv. 4/6-7.

The length of the head is contained four times and one-third in the total length (caudal excluded); snout broad, obtuse, a little longer than the diameter of the eye, which is contained five times and a-half in the length of the head; orbit with the adipose eyelids moderately developed. Dorsal fin much higher than long, the third (longest) ray being not much shorter than the head. The pectoral fin extends to the twelfth scale of the lateral line, and nearly to the vertical from the origin of the dorsal. A conspicuous ridge runs along the caudal portion of the lateral line Blackish-olive above, silvery beneath; the anterior rays of the dorsal fin, and the upper ones of the caudal with brown dots.

Cape Grenville (Chevert Exp.)

830. SAURIDA TRUCULENTA, *n. sp.*

B. 14. D. 11. A. 11. L. lat. 58. L. transv. 4/6.

Height of body one-tenth of the total length, length of the head nearly one-fifth. Head broad and flat above, and rather pointed at the snout. The eye is large and partially covered on each side by an adipose membrane; the length of the snout from the eye is about equal to the largest diameter of the orbit. The space between the eyes has a width of rather more than two diameters of the eye, and has a broad shallow groove in the middle; immediately above the snout there is a bony protuberance, over each eye a sharp horizontal ridge and behind these in the same line, one or two small, sharp protuberances. The teeth are extremely large and numerous. The scales are large and rather loose; they commence on the occiput. The pectoral fin extends to a little beyond the commencement of the ventral, and these are placed entirely in front of the dorsal, which commences nearly opposite their posterior third. The two first rays of the



dorsal are higher than the body. The adipose fin is opposite the third last anal ray. Caudal fin forked, the rays very strong. Colour in spirits, brownish above, whitish beneath; fins yellowish. Length twenty inches.

Port Jackson.

831. SAURIDA ARGENTEA, *n. sp.*

B. 13. D. 12. A. 10. L. lat. 55. L. transv. 5/8.

Height of body one-tenth, and length of head one-seventh of the total length. The head is flat above and tapers to a rounded snout, which is considerably longer than the diameter of the eye; a short ridge behind the occiput, behind the line of the back. The pectoral fin does not nearly reach the ventral, which is placed only a very little in front of the vertical from the dorsal. Caudal fin forked; dorsal higher than long, the first rays much higher than the body. Colour bluish above, whitish beneath, most of the scales showing a silvery centre, the middle rays of the tail blackish. Length seven inches.

Endeavour River.

Genus AULOPUS, Cuv.

Head and body rather elongate, slightly compressed, covered with scales of moderate size. Cleft of the mouth very wide; maxillary well developed, dilated behind. Teeth small, cardiform, in bands in the jaws, on the vomer, palatine, and pterygoid bones, and on the tongue. Eye of moderate size. Pectoral and ventral fins well developed; the latter nine-rayed, inserted close behind the pectorals, below the anterior dorsal rays. Dorsal fin in the middle of the length of the body, rather elongate, with fifteen or more rays; adipose fin small; anal of moderate length; caudal forked. Gill-opening very wide; branchiostegals numerous; pseudobranchiæ well developed. Pyloric appendages few. Air-bladder none.

Mediterranean. Australia.

832. *AULOPUS PURPURISSATUS*, Richards.

Gunth., Cat. Fishes V., p. 403.

" *Sergeant Baker* " of the Fishermen.

D. 19-22. A. 13-14. V. 9. L. lat. 51. L. transv. 6/9.

The length of the head is contained thrice and one-fourth in the length of the body (caudal fin excluded); the second and third dorsal rays produced into a long filament in the males. The colours of this fish are very brilliant, consisting chiefly of purple and red.

Port Jackson; rare in Melbourne.

Genus *CHLOROPHTHALMUS*, Bonap.

Head and body rather elongate, rather compressed behind, covered with scales of moderate size. Cleft of the mouth wide; maxillary well developed, dilated behind. Teeth minute, in narrow bands in the jaws, on the vomer, the palatine bones and the tongue. Eye large. Pectoral and ventral fins well developed; the latter nine-rayed, inserted at no great distance behind the pectorals, somewhat behind the origin of the dorsal fin. Dorsal fin somewhat before the middle of the length of the body, short, with eleven or twelve rays; adipose fin small; anal short; caudal forked. Gill-opening very wide; branchiostegals ten; pseudobranchiæ well developed.

Mediterranean. Australian Seas.

833. *CHLOROPHTHALMUS NIGRIPINNIS*, Gunth.

Gunth., Ann. and Mag. Nat. Hist. 1878, Vol. II., p. 182.

B. 7. D. 11. A. 9. L. lat. 50.

The length of the head is contained thrice and three-fourths in the total length (without caudal). The eye is large, two-fifths of the length of the head, and three times the width of the interorbital space. The distance of the adipose fin from the

dorsal equals that between the latter and the front margin of the eye. Teeth in the jaws, on the vomer and palatine bones, in very narrow bands. Pectoral fins rather shorter than the ventral, which extends far beyond the vent, the vent being much nearer to the ventral than to the anal. Silvery, with some very indistinct darker spots on the sides of the body; top of the dorsal fin and extremity of each caudal lobe black.

Off Twofold Bay, 120 fathoms. (Challenger.)

Genus SCOPELUS, Cuv.

Body oblong, more or less compressed, covered with large scales, those of the lateral line being generally the largest. Series of phosphorescent spots run along the lower side of the head, body, and tail, and a similar substance occupies the front of the snout and the back of the tail. Head generally compressed, with the bones thin but ossified. Cleft of the mouth very wide. Intermaxillary very long, styliform, tapering; maxillary well developed. Teeth villiform, in bands, in both jaws, on the palatine and pterygoid bones, and on the tongue; the vomerine teeth are not visible except in the large specimens. Eye large. Pectoral and ventral fins well developed, the latter are eight-rayed, inserted immediately in front of the dorsal, or below its anterior portion, at some distance behind the base of the pectoral. Dorsal fin in, or nearly in, the middle of the length of the body; adipose fin small, sometimes fimbriated. Anal fin generally long; caudal forked. Gill opening very wide; the outer branchial arch extending forward to behind the symphysis of the lower jaw, and beset with very long gill-rakers. Branchiostegals from eight to ten. Pseudobranchiæ well developed. Air-bladder small. Pyloric appendages in small number.

Pelagic Fishes of all Seas.

834. SCOPELUS CUVIERI, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 106.

D. 12. A. 19. V. 8. P. 17. L. lat. 41.

The height of the body is contained three times and eight-tenths in the total length; the length of the head four times; the diameter of the eye twice in the length of the head. Anterior profile very convex; nostrils large and inflated; lower jaw longer than the upper; the teeth are numerous and villiform; the maxillaries reach to the end of the præoperculum, are very slender, gradually widen posteriorly, and end in an oblique curve. The eye is very large. The scales are rather deciduous and ciliated, very large on the opercles and broad on the lateral lines. The dorsal fin is situated nearer to the snout than to the base of the caudal, the two first rays are short, the first shortest; the anal the same; the pectorals reach as far back as the ventrals, which are rather in advance of the dorsal. The adipose fin is broad, arched, pointed, and placed above the end of the anal; two sharp spines on the lower profile between the anal and the caudal fins. Colour a brilliant and iridescent silver; the fins bright yellow.

Torres Straits (Castelnau).

835. SCOPELUS BOOPS, Richards.

*Myctophum boops*, Richards., Voy. Erebus and Terror, p. 39, pl. 27, figs. 6-12.

D. 14. A. 20. P. 15. V. 8. L. lat. 35.

The height of the body and the length of the head about equal, and one-fifth of the total length. The eye large, exceeding in diameter the width of the interorbital space. The luminous substance forming a conspicuous frontal keel. The dorsal fin is placed above the beginning of the ventrals; the pectorals reach the anus. The body is ornamented with a number of opalescent dots with a black border.

The sea between New Zealand and Australia (Richards.).

## 836. SCOPELUS CORUSCANS, Richards.

*Myctophum coruscans*, Richards., Voy. Erebus and Terror, p. 40,  
pl. 27, figs. 1-5.

D. 12. A. 20. P. 17. V. 8. L. lat. 38.

More compressed than *S. boops*, tapering to a very slender tail. The eye is a little removed from the profile and is placed rather in advance of the middle of the cleft of the mouth. The inter-orbital space is convex, without any appearance of the glandular substance, which seems to be confined to the immediate border of each nostril. An elevated acute mesial line separates one nasal prominence from the other. The ventral fins are attached at the commencement of the second third of the length of the fish, caudal excluded. The dorsal commences a little behind them; and the upper surface of the tail behind the adipose fin, is covered by six convex scales, without the flat surface or glandular appearance of the preceding species. The posterior rays of the dorsal and anal are divided to the base. No spines at the base of the caudal. The scales are undulated, very irregularly and sparingly toothed on the free edge, and with three basal furrows. Coloured and spotted as in *S. boops*.

Australian Ocean (Richardson).

## 836. SCOPELUS CEPHALOTES, Casteln.

Researches Fishes of Australia, p. 46.

D. 9. A. 10. P. 12.

The height of the body is one-fourth of the total length, the length of the head one-third; form rather elongate; upper profile not very convex; eye very large, contained three times and a-quarter in the length of the head; lower jaw considerably longer than the upper one, and when the mouth is shut it appears pointed and directed upwards, the cleft of the mouth being very oblique; teeth very numerous, placed very near one another, and directed backwards; the maxillary extends further than the

centre of the eye ; body covered with scales placed in transverse lines, and finely striated ; one dorsal situated at near the two posterior thirds of the body ; it is narrow, but high, and formed of one spine and eight rays ; caudal rather pointed ; anal with three spines and seven rays ; the first spine is short, the second longer, and the third much longer still, and almost equal to the rays ; the pectorals of twelve rays extend to the end of the ventrals ; no adipose fin ; the highest part of the fish is at the posterior part of the head, and from thence its form goes tapering to the end of the tail. The body, in the spirits, appears to have been of a lilac colour, covered in a great part by a pearl-coloured tinge ; very minute black dots are seen on the greatest part of the body, and several marmorated spots appear on some of the specimens ; the fins are of a light yellow, with some black dots at their base. The specimens are about one inch and a-half long.

Adelaide.

Count Castelnau suggests *Neoscopelus* as a new genus for this Fish. It certainly does not fit in well to the genus *Scopelus*.

#### Genus ALEPIDOSAURUS, Lowe.

Body elongate, rather compressed, scaleless ; head compressed with the snout much produced, and with the cleft of the mouth very wide ; intermaxillary very long and very slender ; maxillary thin, needle-like, as long as the intermaxillary, immoveable. Teeth very unequal in size, immoveable. A series of very small teeth runs along the entire length of the intermaxillary. Teeth of the palatine bone compressed, triangular, pointed, the two or three anterior ones being exceedingly long and strong, and the posterior ones of moderate size. Teeth of the lower jaw similar to those of the palatine bones, one pair in front, and two or three pairs in the middle being much enlarged. No teeth on the tongue. Eye large ; pectoral and ventral fins well developed. The rayed dorsal fin occupies the whole length of the back from the occiput to the anal fin. Adipose and anal fins of moderate size. Caudal

forked. Gill-opening very wide. Branchiostegals six or seven. The outer branchial arch with stiff, shortish spine-like gill-rakers. Pseudobranchiæ well developed. Air-bladder none.

Ocean Fishes, Atlantic and Pacific.

837. ALEPIDOSAURUS FEROX, Lowe.

Gunth., Cat. Fishes V., p. 421.—Richards., Voy. Erebus and Terror, p. 34, pl. 22, figs. 1-4.

B. 6-7. D. 41-44. A. 14-17. P. 14-15. V. 9-10.

The length of the head is twice the height of the body, and rather less than one-sixth of the total length, (without caudal). The eye occupies the middle of the length of the head, of which it is one-sixth; its diameter equals the width of the interorbital space. Dorsal fin much elevated. Pectoral elongate, but terminating at a great distance from the ventral; the first ray of the dorsal, pectoral, and ventral fins with the edge slightly serrated. Upper caudal lobe produced into a long filament.

Tasmania (Richardson).

FAMILY IV. STOMIATIDÆ.

Skin naked or with exceedingly fine scales; a hyoid barbel. Margin of the upper jaw formed by the intermaxillary and maxillary, which are both toothed; opercular apparatus but little developed. Gill-opening very wide; pseudobranchiæ none. Adipose fin absent or present. The eggs are enclosed in the sacs of the ovarium, and excluded by oviducts.

Deep Sea Fishes.

Genus ECHIOSTOMA, Lowe.

Body elongate, compressed, scaleless, with the vent situated at no great distance from the caudal fin. Head rather compressed, with the snout short, and the cleft of the mouth very wide. Teeth pointed, unequal in size, those of the intermaxillary and anterior



part of the mandible being the longest; maxillary teeth in a single series, those of its lower two-thirds being very small; teeth of the hinder part of the mandible in a double or treble series; vomer with a pair of fangs; palatines with a single series of small, pointed teeth; two groups of similar teeth on the tongue, Eye of moderate size. Opercular portion of the head very narrow and flexible. A fleshy barbel is suspended from the centre of the hyoid region. Dorsal fin opposite the anal, close to the caudal; caudal forked. Pectoral and ventral fins feeble, the latter inserted behind the middle of the length of the body. Series of phosphorescent dots run along the lower side of the head, body, and tail. Gill-openings very wide; the outer branchial arch with minute gill-rakers; pseudobranchiæ none. Air-bladder none.

Atlantic and Pacific Oceans.

838. ECHIOSTOMA MICRODON, Gunth.

Ann. and Mag. Nat. Hist., 1878, Vol. II., p. 180.

D. 24. A 29. P. 3. V. 7.

The length of the head is more than one-fifth of the total length (without caudal). No separate pectoral ray; root of the ventral considerably nearer to the base of the caudal than to the extremity of the snout. All the teeth rather small, a few only in the middle of the palatine bone. Black; two luminous organs below the eye; a narrow elongate one above the maxillary, and a small, short one nearer the eye.

North-west Coast of Australia, 2,440 fathoms (Challenger).

839. ECHIOSTOMA MICRIPNUS, Gunth.

Ann. and Mag. Nat. Hist., 1878, Vol. II., p. 180.

D. 21. A. 23. P. 1/3. V. 7.

The length of the head is nearly one-ninth of the total length. Barbel much longer than the head, and fringed at its extremity;



the anterior pectoral ray filamentous, and distinctly separated from the others. Root of the ventral rather nearer to the extremity of the snout than to the root of the caudal. Black; luminous organ above the maxillary small, round, like a rudimentary eye.

South Coast of Australia, 2,150 fathoms (Challenger)

#### FAMILY V. SALMONIDÆ.

Body covered with scales; head naked; barbels none. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. Belly rounded. A small adipose fin behind the dorsal. Pyloric appendages generally numerous, rarely absent. Air-bladder large, simple; pseudobranchiæ present. The ova fall into the cavity of the abdomen before exclusion.

#### Genus RETROPINNA, Gill.

Body covered with scales of moderate size. Cleft of the mouth of moderate width. Small teeth, subequal in size, in single series on the jaws, vomer, palatines and pterygoids; tongue with a double series of small hooked teeth. Dorsal fin situated far backwards, behind the ventrals, above the vent; anal rather long; caudal forked; ventral six-rayed. Pseudobranchiæ present. Stomach horseshoe-shaped, without prolonged blind sac; pyloric appendages and air-bladder present.

Freshwaters, New Zealand and Australia.

#### 840. RETROPINNA RICHARDSONII, Gill.

Proc. Acad. Nat. Philad., 1862, p. 14.—Gunth., Cat. Fishes VI.  
p. 171.

*Argentina retropinna*, Richards., Voy. Erebus and Terror, p. 121,  
pl. 52, figs. 1-3.

B. 6. D. 11-12. A. 17-20. P. 11. V. 6. L. lat. 61.

The height of the body is less than the length of the head, which is contained four times and two-thirds in the total length (without caudal). Snout shorter than the eye, the diameter of which is two-sevenths of the length of the head. The lower jaw is the longer. Coloration uniform, with a silvery band along the side.

Rope's Creek. Length three inches.

#### FAMILY VI. GALAXIDÆ.

Body naked; barbels none. Margin of the upper jaw chiefly formed by the intermaxillaries, which are short and continued by a thick lip, behind which are the maxillaries. Belly rounded. Adipose fin none; dorsal opposite to anal. Pyloric appendages in small number. Air-bladder large, simple; pseudobranchiæ none. The ova fall into the cavity of the abdomen before exclusion.

#### Genus GALAXIAS, Cuv.

A series of conical teeth in the jaws, on each palatine bone, and on each side of the tongue; teeth on the tongue hook-like.

Rivers of Australia, New Zealand and Southern parts of South America.

#### 841. GALAXIAS TRUTTACEUS, Cuv. & Val.

Gunth, Cat. Fishes VI., p. 209.—Richards., Voy. Erebus and Terror, p. 75, pl. 42, figs. 1-6.

B. 9. D. 11. A. 14-15. V. 7. P. 14.

Body stout; head broad, depressed, its length being somewhat more than the height of the body, and two-ninths or a little less of the total length (without caudal). Jaws equal in length. Cleft of the mouth of moderate width, the maxillary not quite extending to below the middle of the eye. Eye of moderate size, two-ninths of the length of the head and shorter than the snout. The length of the pectoral fin is one-half of the distance of its root from

the ventral, and the ventral terminates at a considerable distance from the vent; the anal, if laid backwards, extends scarcely to the base of the caudal. The least depth of the tail is somewhat more than one-half of the distance between the caudal and dorsal fins. Dark olive-coloured, with numerous, small, round, blackish spots; two or three dark cross-bars above the pectoral fin; an oblique, blackish streak below the eye; extremities of the dorsal, anal, and pectoral fins black.

Tasmania.

842. *GALAXIAS OLIDUS*, Gunth.

Gunth., Cat. Fishes VI., p. 209.

D. 11. A. 13. P. 14. V. 7.

Body stout; head thick, its length being about equal to the height of the body, and two-ninths of the total length (without caudal). The lower jaw is a little shorter than the upper; cleft of the mouth of moderate width, the maxillary not quite reaching to below the middle of the eye. Eye rather small, less than one-sixth of the length of the head, and much shorter than the snout. The length of the pectoral fin is less than one-half of the distance of its root from the ventral, and the ventral fin terminates at a considerable distance from the vent; the anal fin, if laid backwards scarcely reaches the base of the caudal. The least depth of the tail is one-half of the distance between caudal and dorsal fins. Brownish-red above, yellowish-red below; all the fins and opercles with thick black dots; a few scattered similar dots on the side of the tail.

? Queensland (Gunther). Length four inches.

843. *GALAXIAS ATTENUATUS*, Jenyns.

Gunth., Cat. Fishes VI., p. 210.

*G. scriba*, (not Cuv. & Val.) and *G. maculatus*, (not Jenyns), Richards., Voy. Erebus and Terror, p. 75-76, pl. 43, figs. 14-17.

D. 11. A. 17. P. 12. V. 7. Cæc. pylor. 2.

Body elongate, its depth in front of the dorsal fin being one-eighth or one-tenth of the length (without caudal); the length of the head nearly one-sixth of the same. Snout with the jaws equal in length; cleft of the mouth rather narrow; the maxillary extending to below the anterior margin of the orbit. Eye of moderate size, somewhat shorter than the snout, more than one-fifth of the length of the head. The length of the pectoral fin is much less than one-half the distance of its root from the ventral, and that of the ventral is about one-third of the distance of its root from the anal. The least depth of the tail is one-half of the distance between the dorsal and caudal fins. Caudal emarginate. Yellowish-olive, body with numerous faint spots, each spot being composed of minute dots. Operculum silvery.

Tasmania.

844. GALAXIAS KREFFTHI, Gunth.

Gunth., Cat. Fishes VI., p. 211.

D. 12. A. 16. P. 12. V. 7.

Body moderately elongate, subcylindrical, its depth in front of the dorsal fin being contained seven times and one-half in the total length (without caudal); the length of the head is five times and a-half in the same. Snout broad, with the jaws equal in length; cleft of the mouth rather narrow; the maxillary extending to nearly below the front margin of the orbit. Eye of moderate size, as long as the snout, one-fourth of the length of the head. The length of the pectoral fin is considerably less than one-half of the distance of its root from the ventral; and that of the ventral is two-fifths of the distance of its root from the anal. The least depth of the tail is one-half of the distance between the dorsal and caudal fins. Caudal truncate. Yellowish-olive (in spirits); back powdered with minute black dots.

New South Wales. Rope's Creek. ? Murray River.

845. *GALAXIAS SCRIBA*, Cuv. & Val.

Gunth., Cat. Fishes VI., p. 212.

D. 11. A. 15. P. 14. V. 7.

The height of the body is one-half of the length of the head, which is one-fifth of the total length (without caudal); the diameter of the eye is only two-fifths of the length of the head. Caudal fin truncate. Yellowish: minute black dots are crowded so as to form irregularly fluxuous lines; a large blotch at the base of the caudal fin.

Port Jackson (Val.) Length three inches.

846. *GALAXIAS PUNCTATUS*, Gunth.

Gunth., Cat. Fishes VI., p. 212.

D. 12. A. 16. P. 12. V. 7.

Body elongate, its depth in front of the dorsal fin being one-eighth of the length (without caudal); the length of the head one-sixth of the same. Snout with the jaws nearly equal in length; cleft of the mouth rather narrow, the maxillary extending nearly to below the anterior margin of the orbit. Eye two-thirds of the length of the snout, and less than one-fifth of the length the head. The length of the pectoral fin is nearly one-third of the distance of its root from the ventral, and that of the ventral two-fifths of the distance of its root from the anal. The least depth of the tail is one-half of the space between the dorsal and caudal fins. Caudal fin emarginate. Light brownish-olive: upper half of the head and body with numerous small, black spots or dots.

Eastern Creek. Length six and a-half inches.

847. *GALAXIAS COXII*, Mael.

Proc. Linn. Soc. N.S. Wales, Vol. V., p. 45.

Mount Wilson. Falls for the Colo River.

848. GALAXIAS PLANICEPS, *n. sp.*

D. 11. A. 13. P. 14. V. 6.

The height of the body immediately in front of the dorsal fin is one-eighth of the total length (without caudal); the length of the head about one-fifth of the same. The top of the head very flat and depressed; the mouth is rather large and slightly oblique, the maxillary reaching to below the middle of the eye. Eyes rather large, two diameters apart, one diameter from the snout, and over four times in the length of the head. The length of the pectoral fin is considerably less than half the distance of its root from the ventral; the length of the ventral is two-fifths of the distance of its root from the anal. The caudal fin is broad, spreading, and slightly emarginate. The colour, in spirits, is a uniform pale red, with the fins and head yellowish; there are no spots or dots visible anywhere.

Rankin's Lagoon near Bathurst.

849. GALAXIAS BONG-BONG, *n. sp.*

D. 11. A. 11. P. 14. V. 7.

The greatest height of the body is one-fifth of the length (without caudal); the length of the head the same. The snout is rounded in front; the maxillary reaching to below the anterior third of the eye. The length of the pectoral fin is nearly one-half the distance of its root from the ventral, and that of the ventral is quite half the length of the space between the root of the ventral and the anal. Caudal fin very slightly emarginate, its membrane extending very considerably on to the upper and lower portions of the tail, and almost continuous with the anal fin. The colour in spirits is red, more or less densely spotted and clouded with black, the vertical fins slightly tinged with blackish. Length three inches.

Moss Vale and rivers at Bong-bong.

850. *GALAXIAS NEBULOSA*, *n. sp.*

D. 12. A. 18. P. 14. V. 7 or 8.

The height of the body at the pectoral fin is one-ninth of the length (without caudal); the length of the head one-fifth; the diameter of the eye is about one-fourth of the length of the head. Snout rounded; the maxillary reaches to below the anterior third of the eye. The middle rays of the pectoral fin are the longest and its length is rather more than half the space between the root of the pectoral and that of the ventral, the length of the ventral is about half that of the distance between the roots of the ventral and anal. Caudal fin long, not or scarcely emarginate. Colour in spirits, pale yellowish-brown, entirely and closely covered fins and all with exceedingly minute black dots, with five or six irregular, little distinct, brown fasciæ descending from the back below the middle of the sides, sometimes a few large spots in the interspaces between these fasciæ. Length three inches.

Long Bay near Sydney.

851. *GALAXIAS WATERHOUSEI*, Krefft.

Proc. Zool. Soc., London, 1867, p. 943.

D. 11. A. 15. P. 13. V. 7.

Body stout, its depth in front of the dorsal fin being nearly one-eighth of the length (without caudal); the length of the head is a sixth of the same. Eye of moderate size, one-fourth of the length of the head, and equal to the extent of the snout. The length of the pectoral fin is one-third of the space between its root and that of the ventral; the ventrals are of the same length, and almost in the middle between the vent and the root of the pectorals. The anal if laid backwards does not reach the base of the caudal. The distance between the dorsal and caudal fin is much greater than the least depth of the tail. Coloration uniform brownish; back and sides finely black-dotted; operculum with a golden tint.

Creeks, South Australia. Length seven inches.

## 852. GALAXIAS OCELLATUS, M'Coy.

Casteln., Proc. Zool. Soc., Victoria, Vol. I., p. 175.

"The Yarra Trout."

D. 11. A. 15. P. 14. V. 7.

The height of the body is contained five times and one-third in the total length; the length of the head five times and two-thirds. The head is convex over the eye. The caudal fin is rounded; the ventrals are nearer to the anal than to the pectorals. The body is of a light olive green, with the belly grey; it is covered with iridescent round ocellated black spots; the sides of the operculum have a golden tinge; the fins are of the general colour of the body; the pectorals are white, the eye is green, speckled with black.

River Yarra. Length six inches.

## 853. GALAXIAS CYLINDRICUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 177.

D. 10. A. 12-14. V. 7.

Like *G. attenuatus*, but more elongate, the height of the body being about one-eleventh of the total length; the length of the head is contained seven times and a quarter in the same; the diameter of the eye is contained four times and a half in the length of the head; the caudal fin is emarginate; of eighteen or nineteen long rays; the ventrals are placed at an equal distance from the end of the mandible and the base of the anal. Six large hooked teeth on the front part of the tongue, and others on each side backwards. Colour the same as in *G. attenuatus*.

Lower Yarra. Length seven or eight inches.

## 854. GALAXIAS DELICATULUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 178.

D. 10. A. 19. C. 16.



Form elongate, the height of the body is one-seventh of the length to the middle of the caudal fin; the length of the head is six times and two-thirds in the same. The head is of a light brownish-red; the body of a light yellow-green above the lateral line, and is covered with faint, irregular transversal spots, formed of very fine blue points. The lateral line is little marked on its anterior portion, but very distinct, and of a yellowish colour behind; below this line the colour is a fine opal white; the eye is silvery. The dorsal fin is of the colour of the back, but its terminal portion is lighter; the caudal is of a yellowish-green; the pectorals, ventrals, and anal of a transparent white; the caudal is feebly bilobed.

Yarra River. Length four inches.

855. *GALAXIAS AMÆNUS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 178.

D. 12. A. 14.

The height of the body is five times and two-thirds in the length to the middle of the caudal; the length of the head four times and one-third. Of a light green colour; a brown spot between the eyes, extending a little behind them; the back covered with very minute black points, forming very indistinct, transverse, oblique lines, better marked on the posterior part. A considerable number of points, rather larger than the others, are disposed on the body, and form a double but rather irregular, longitudinal line on the middle of the back. The lower side of the body is covered with the same punctuation and bands as the back, but the belly is of a rather dark blue-silvery colour; the eye is of a dark green.

Yarra River. Length three to four inches.

856. *GALAXIAS VERSICOLOR*, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 176.

## D. 9. A. 12. P. 13. C. 16.

Body oval; head attenuated and rather pointed. The height of the body is four times and two-thirds in the total length, the length of the head five times and eight-tenths; diameter of eye four times and one-third in the length of the head. Lower jaw a little longer than the upper; the cleft of the mouth small; the maxillary just reaching to below the anterior margin of the eye. The fins are rather large, the dorsal and anal opposite one another; the caudal is emarginate; the length of the pectoral is equal to the distance from the posterior margin to the end of the operculum; the ventrals are midway between the pectorals and the anal. The teeth are small on the upper jaw, but much larger, straight, pointed, and rather distant from one another, on the lower jaw; those of the tongue are large, straight, and pointed. The colour of the body is a fine green; the lower portions of the head and body are, the first grey, the other orange-yellow; the whole covered with very minute blue points. The fins are grey, with the rays white; the ventrals are white; eye golden.

Marsh near St. Kilda. Length five and a-half inches.

## 857. GALAXIAS ORNATUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 153.

## D. 10. A. 11. P. 12. V. 7.

Height of body one-seventh of the total length, and equal to the length of the head. Lower jaw rather longer than the upper; diameter of eye one-fourth of the length of the head, and less than the extent of the snout. The dorsal is situated at double the distance from the snout that it is from the base of the caudal; caudal fin strongly emarginate; anal placed a little behind the dorsal; the ventrals equidistant from the base of the pectorals and anal; the pectorals are of the length of the distance between the posterior edge of the eye and the extremity of operculum. Colour above light green, beneath golden yellow; on the back

are numerous transverse bands, rather narrow, but well defined of an obscure green. These bands are not agglomerations of fine points, as in many species; eyes yellow; fins light yellow.

Cardinia Creek, Victoria. Length four and a-half inches.

#### FAMILY VII. SCOMBRESOCIDÆ.

Body covered with scales; a series of keeled scales along each side of the belly. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. Lower pharyngeals united into a single bone. Dorsal fin opposite the anal, belonging to the caudal portion of the vertebral column. Adipose fin none. Air-bladder generally present, simple, sometimes cellular, without pneumatic duct. Pseudobranchiæ hidden, glandular. Stomach not distinct from the intestine, which is quite straight, without appendages.

#### GENUS BELONE, Cuv.

Both jaws prolonged into a long, slender beak, the upper part being formed by the intermaxillaries, which are united by a longitudinal suture. Both jaws with a band of asperities, and with a series of longer, conical, pointed, widely set teeth. Body elongate, slender, covered with small scales. All the dorsal and anal rays connected by a membrane. Gill-openings very wide. Intestinal tract simple without appendages. Air-bladder large.

Seas of temperate and tropical regions, entering rivers.

#### 858. BELONE DEPRESSA, Poey.

Gunth., Cat. Fishes VI., p. 235.

D. 13-14. A. 18-19.

The free portion of the tail is strongly depressed, and dilated into a broad sharp edge on each side. Body rather depressed, subpentagonal. The length of the head is rather less than one-third of the total (without caudal); its upper surface flat, striated,

without distinct median groove; superciliary region faintly striated; base of the intermaxillaries much depressed. Maxillary entirely hidden by the præorbital, which is scaly. Teeth very small; vomerine teeth none. The diameter of the eye is somewhat more than the width of the interorbital space, and one-half of the length of the post-orbital portion of the head. Depth of the body considerably less than the length of the pectoral fin, which is more than the distance of the opercular margin from the orbit. Ventral fin nearly midway between the eye and the caudal fin. The middle and hinder dorsal and anal rays subequal in length, short, the last terminating at a great distance from the root of the caudal. The origin of the anal is in advance of that of the dorsal. Caudal fin forked. Scales not very small, adherent. Green above, silvery below.

North-west Australia (Haslar Collection).

859. *BELONE MELANOTUS*, Bleek.

Atl. Ichth. Scombr., p. 47, tab. 10, fig. 2.—Gunth., Cat. Fishes VI., p. 238.

D. 24-26. A. 22-24.

The free portion of the tail is subtetrahedral, scarcely higher than broad, with a slight narrow longitudinal keel along the side. The length of the head is contained thrice and a sixth in the total length (without caudal); its upper surface flat, striated without conspicuous median groove; superciliary region striated; base of the intermaxillaries broad, slightly compressed; maxillary entirely hidden by the præorbital. Teeth of moderate strength; vomerine teeth none. The diameter of the eye is a little less than the width of the interorbital space, and one-half of the length of the postorbital portion of the head. Body slightly compressed, its depth being less than the length of the pectoral fin, which nearly equals the distance of the opercular margin from the orbit. Tongue covered with tubercular asperities. Ventral fin midway between the front margin of the eye and the root of the caudal.

The middle and hinder dorsal and anal rays are very slender and somewhat prolonged, the last extending nearly or quite to the root of the caudal. Caudal fin deeply forked. Scales very thin and minute, deciduous.

Cape York (Chevert Exp.). Port Darwin.

860. *BELONE ANNULATA*, Cuv. & Val.

Gunth., Cat. Fishes VI., p. 240.—Bleek., Atl. Ichth. Scembr., p. 48, pl. 12, fig. 3.

D. 23-24. A. 21-22.

The free portion of the tail is tetrahedral, higher than broad, with a slight narrow longitudinal keel along the side. The length of the head is contained twice and a-third in the total length (without caudal), its upper surface with a broad and very shallow median groove; superciliary region striated; base of the intermaxillaries depressed; maxillary nearly entirely hidden by the preorbital. Teeth strong; vomerine teeth none. The diameter of the eye is two-thirds of the width of the interorbital space, and two-fifths of the length of the postorbital portion of the head. Body slightly compressed, its depth being much less than the length of the pectoral fin, which is more than the distance of the opercular margin from the orbit. Tongue covered with tubercular asperities. Ventral fin midway between the front margin of the eye and the root of the caudal fin. The middle and hinder rays of the dorsal fin are very slender and somewhat prolonged, the last extending nearly or quite to the root of the caudal. Caudal fin forked. Scales very thin and minute, deciduous.

Percy Islands and Cape York (Chevert Exp.). Length over three feet.

861. *BELONE FEROX*, Gunth.

Gunth., Cat. Fishes VI., p. 242.

“*Long Tom*” of the Fishermen.

D. 21. A. 26.

The free portion of the tail broad and depressed. The length of the head is less than one-third of the total (without caudal); its upper surface with a broad median groove, tapering behind and widening in front; superciliary region striated; base of the intermaxillaries depressed; only the basal half of the maxillary is hidden by the præorbital. Jaws and teeth strong; vomerine teeth none; tongue smooth. The diameter of the eye is two-thirds of the width of the interorbital space, and two-sevenths of the length of the postorbital portion of the head. Body compressed, its depth being less than the length of the pectoral fin, which exceeds the distance of the opercular margin from the orbit. The middle and hinder dorsal and anal rays are subequal in length, short, the last terminating at a considerable distance from the root of the caudal. Caudal fin truncate. Scales thin and rather small; adherent.

Port Jackson.

862. *BELONE CAUDIMACULATA*, Cuv. & Val.

Gunth., Cat. Fishes VI., p. 245.—Bleek., Atl. Ichth. Scombr., tab. 10, fig. 3.

D. 13. A. 15-16.

The free portion of the tail is compressed, much deeper than broad. The length of the head is contained twice and a-third in the total length (without caudal); its upper surface flat, with a rather shallow median groove of moderate width; superciliary region with one or two striæ; base of the intermaxillaries depressed; maxillary only half hidden by the præorbital. Teeth rather small; vomerine teeth none. The diameter of the eye equals the width of the interorbital space, and is contained twice and three-fourths in the length of the postorbital portion of the head. Body broad, subcylindrical, its depth being considerably

less than the length of the pectoral fin, which is more than the distance of the opercular margin from the orbit. Ventral fin midway between the eye and the caudal fin. The middle and hinder rays of the dorsal and anal fins are subequal in length, short, the last terminating at a considerable distance from the root of the caudal. Caudal fin rounded. Scales rather small, adherent. A small round, deep black spot at the root of the caudal fin.

Port Darwin.

863. *BELONE KREFFTHI*, Gunth.

Gunth., Cat. Fishes VI., p. 250.

D. 17. A. 19. P. 13.

The free portion of the tail is strongly compressed, much deeper than broad. The length of the head is contained twice and two-fifths in the total (without caudal); a scaly groove of moderate width runs along the middle of its upper surface; superciliary region slightly striated; base of the intermaxillaries much depressed; maxillaries two-thirds hidden by the præorbital. Teeth rather feeble, widely set; tongue smooth. The diameter of the eye equals the width of the interorbital space, and is one-third of the length of the postorbital portion of the head. Body strongly compressed, its depth being not much less than the length of the pectoral fin, which is somewhat less than the distance of the opercular margin from the orbit. Ventral fin midway between the præoperculum and caudal fin. Origin of dorsal fin opposite to that of anal. The middle and hinder dorsal and anal rays, subequal in length, short, the last terminating at some distance from the root of the caudal. Caudal fin slightly emarginate. Scales thin and small. Upper parts blackish, sides and belly silvery white, the two colours separated by a narrow greenish streak.

Rivers of Northern Queensland. Length two feet.



864. *BELONE GAVIALOIDES*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 142.

D. 22. A. 23. P. 12.

The length of the head is three times and a-half in the total length (without caudal); its upper surface is flat and impressed with two large radiated impressions, an elongated space in front of the eyes covered with small scales; a longitudinal groove on the medial line of the snout. Teeth very fine and numerous, with a line of large, conical, distant ones on each of both jaws, getting smaller and closer behind; no vomerine teeth; tongue smooth. The diameter of the eye is half the width of the interorbital space. Body rather compressed; its height is less than the length of the pectorals. Caudal fin strongly emarginate, the lower lobe longer than the upper. Colour in spirits dark brown above, silvery beneath; the snout black; the fins yellow.

West Australia. Length from three to four feet.

865. *BELONE GRACILIS*, *n. sp.*

D. 20. A. 22. C. 17.

The length of the head is one-fourth of the total length (without caudal); its upper surface is striated, with a broad moderately deep groove in the centre; the beak is striated above; the præ-orbital entirely covers the maxillary. The diameter of the eye is about equal to the width of the interorbital space, and one-third of the length of the postorbital portion of the head. The length of the pectoral fin is much greater than the height of the body, but much less than the distance between the opercular margin and the eye. The ventral fin is situated nearer to the eye than to the root of the caudal. The anal fin commences much in advance of the dorsal, but both terminate near and at an equal distance from the caudal; the hinder rays of both are short and well apart. The caudal is long and rather acutely rounded; the free portion of the tail is much flattened above, and roundly keeled

at the sides. The colour is reddish above the median line of the body which is well marked by a bluish silvery streak, beneath it is silvery, the pectoral fin is distinctly tipped with black, and the other fins are the same to a less extent.

Port Jackson. Length eight inches.

#### Genus SCOMBRESOX, Lacep.

Both jaws prolonged into a long slender beak, the upper part being formed by the intermaxillaries; both jaws with a series of extremely minute teeth. Body elongate, compressed, slender, covered with small thin deciduous scales. A number of detached finlets behind the dorsal and anal fins. Gill-openings very wide. Intestinal tract simple, without pyloric appendages. Air-bladder large.

Atlantic and Pacific Oceans.

#### 866. SCOMBRESOX FORSTERI, Cuv. & Val.

Gunth., Cat. Fishes VI., p. 258.—Hutton, Fishes, N. Zeal., p. 53.

D. 10/v. A. 11/vii. P. 15. V. 6.

“Length equal to four and a half times that of the head, or ten times the height of the body; length of the head about one and two-fifths that of the snout; lower jaw longer; base of ventrals half way between the root of the caudal and the anterior margin of the eye; upper pectoral ray very broad. Above shining plumbous-blue, below silvery-white.”—(Hutton).

Melbourne (Castelnau). Sydney (Macl. Mus.).

#### Genus HEMIRHAMPIUS, Cuv.

The lower jaw is prolonged into a long slender beak; the upper is short, the intermaxillaries forming a triangular more or less convex plate. Both jaws with a narrow band of minute teeth. Body elongate slender, covered with large or moderate scales. All the dorsal and anal rays connected by a membrane.

Gill-openings very wide. Intestinal tract simple, without pyloric appendages. Air-bladder large.

Tropical Seas, sometimes entering fresh waters.

867. HEMIRHAMPHUS INTERMEDIUS, Cant.

Gunth., Cat. Fishes VI., p. 260.—*H. melanochir*, Cuv. & Val.

“*The Gar Fish*” of the Sydney Market.

D. 15-17. A. 18-20. P. 11.

Scales of moderate size, very deciduous. The length of the entire head is contained twice and three-fourths or twice and four-fifths, in the total (without caudal), the length of the lower jaw beyond the extremity of the upper, five times and a half. The triangular part of the upper jaw, formed by the intermaxillaries, is longer than broad. The diameter of the eye equals the width of the interorbital space, and is contained once and a half or once and two-thirds in the length of the postorbital part of the head. Præorbital as long as high. The root of the ventral fin is midway between the base of the caudal and that of the pectoral. Dorsal and anal fins scaleless, the origins of both nearly opposite. Caudal fin emarginate, the central rays much longer than the eye. Back dark greenish; sides with a well defined silvery band. Pectorals blackish.

Port Jackson, Melbourne, Brisbane, and West Australia.

868. HEMIRHAMPHUS REGULARIS, Gunth.

Gunth., Cat. Fishes VI., p. 261.

“*River Gar Fish*” of Sydney Fishermen.

D. 15. A. 17. L. lat. 58.

The length of the entire head is a little more than one-third of the total (without caudal), the length of the lower jaw beyond the extremity of the upper, one-half the length of the head. The triangular part of the upper jaw, formed by the intermaxillaries is much broader than long. The diameter of the eye is rather

less than the width of the interorbital space, and two-thirds of the length of the postorbital part of the head. Vertex and interorbital space convex. The root of the ventral fin is nearly midway between the front margin of the eye and the base of the caudal fin. Dorsal and anal rays scaleless, the former a little longer than the latter; they commence opposite to each other. Caudal fin moderately forked, with the lobes nearly equal the central rays being much longer than the eye. Sides with a well defined silvery band as broad as a scale.

Port Jackson.

869. *HEMIRHAMPHUS ARGENTEUS*, Beun.

*Hemirhamphus breviceps*, Casteln., Proc. Linn. Soc. Vol. II., p. 240.

Brisbane. Rare in Sydney.

870. *HEMIRHAMPHUS MARGINATUS*, Forsk.

Gunth., Cat. Fishes VI., p. 270.—Bleek., Atl. Ichth. Scombr., tab. 8, fig. 4.

D. 14. A. 11-12. L. lat. 52.

The length of the entire head is contained twice and three-fifths, or twice and a half in the total (without caudal), the length of the lower jaw beyond the extremity of the upper, four times and one-third. The triangular part of the upper jaw, formed by the intermaxillaries, is as broad as long. The diameter of the eye equals the width of the interorbital space, and is contained once and three-fourths in the length of the postorbital part of the head. The root of the ventral fin is nearer to the caudal than to the axil of the pectoral. Dorsal and anal fins scaleless, the former much longer than the latter. Caudal fin deeply forked, the central rays being shorter than the eye. Back dark greenish; sides with a rather indistinct silvery band.

Palm Islands (Chevert Exp.)

## 871. HEMIRHAMPHUS COMMERSONII, Cuv. &amp; Val.

Gunth., Cat. Fishes VI., p. 271.—Bleek., Atl. Ichth. Scombr.,  
tab. 6, fig. 3.

D. 13-14. A. 12. L. lat. 54. Vert. 38/16.

The length of the entire head is contained twice and two-thirds in the total (without caudal), the length of the lower jaw beyond the extremity of the upper, four times and one-third. The triangular part of the upper jaw formed by the intermaxillaries, is much broader than long. The diameter of the eye is less than the width of the interorbital space, and two-thirds of the length of the postorbital part of the head. The root of the ventral fin is equally distant from the base of the caudal and the extremity of the pectoral fins. Dorsal and anal fins scaly anteriorly—the former much longer than the latter. Caudal fin deeply forked, the central rays being equal in length to the diameter of the eye. Back dark greenish; sides with a silvery band and four rounded blackish blotches.

From Port Jackson to Cape York.

## 872. HEMIRHAMPHUS QUOYI, Cuv. &amp; Val.

Gunth., Cat. Fishes VI., p. 267.—Bleek., Atl. Ichth. Scombr.,  
tab. 4, fig. 3.

D. 16. A. 14. P. 12. L. lat. 50-55.

Body tetrahedral, as broad as deep. The length of the head is contained from three times and a half to three times and two-thirds in the total length, that of the snout five times and a half or six times, and that of the prominent part of the lower jaw eight or eleven times. Upper jaw broader than long. The diameter of the eye is contained once and one-third in the length of the postorbital part of the head, and is equal to the width of the interorbital space. The dorsal fin commences before the anal; the ventrals are inserted in the fourth sixth of the total length,

with the inner ray shortest; caudal fin deeply forked, the lower lobe longest. Sides with a silvery band.

South Coast New Guinea (Chevert Exp.)

873. *HEMIRHAMPHUS AMBLYURUS*, Bleek.

Atl. Ichth, Scombr., tab. 4, fig. 1.—Gunth., Cat. Fishes VI., p. 273.

D. 13. A. 10. P. 9. L. lat. 46.

Head and body strongly compressed. The length of the head is contained twice and a fifth in the total (without caudal), that of the snout twice and three-fourths, and that of the prominent part of the lower jaw thrice; upper jaw twice as long as broad, one-fourth of the length of the prominent part of the lower. The diameter of the eye is less than the width of the interorbital space, and less than one-half the length of the postorbital part of the head; vertex flat. The ventral fins are twice as remote from the angle of the præoperculum as from the root of the caudal fin. Caudal fin rounded; anal rays slightly dilated. Sides with a very indistinct silvery band.

Port Darwin. Length five and a-half inches.

Genus *ARRHAMPHUS*, Gunth.

Differs only from *Hemirhamphus* in not having the lower jaw produced into a beak.

Australian Coasts.

874. *ARRHAMPHUS SCLEROLEPIS*, Gunth.

Gunth., Cat. Fishes VI., p. 277.

D. 13. A. 15. L. lat. 43.

The body is compressed, its greatest depth being contained six times and a half in the total length (without caudal); the length of the head is a little less than one-fourth of the same. The triangular part of the upper jaw, formed by the intermaxil-

laries, is a little broader than long; the lower projects conspicuously before the upper. The diameter of the eye is considerably less than the width of the interorbital space, and two-thirds of the length of the postorbital part of the head. The whole of the upper surface of the head, except the intermaxillaries, is scaly. The insertion of the ventral fin is nearer to the extremity of the snout than to the base of the caudal. Pectoral fin two-thirds as long as the head; the dorsal commences opposite the anal, both fins scaly at the base. Caudal fin forked, its central rays much longer than the eye. Seven longitudinal series of scales between the origins of the dorsal and anal fins; the one above the lowest pierced by pores; the others with a slight keel. Sides with a well defined silvery streak, half as broad as a scale.

Port Darwin. Brisbane.

#### Genus EXOCETUS, Artedi.

Jaws short, intermaxillaries and maxillaries separate. Teeth minute, rudimental, and apparently sometimes absent. Body moderately oblong, covered with rather large scales. Pectoral fins very long, formed for flying. All the dorsal and anal rays connected by a membrane. Gill-openings very wide. Intestinal tract simple without pyloric appendages. Air-bladder large.

Tropical and temperate seas.

#### 875. EXOCETUS MICROPTERUS, Cuv. and Val.

Gunth., Cat. Fishes VI., p. 279.—Bleek., Atl. Ichth. Scombr., tab 3, fig. 1.

D. 15. A. 14-16.

Two short barbels at the symphysis of the lower jaw. Body rounded, its height being rather more than one-sixth of the length (without caudal); the length of the head two-ninths of the same. Lower jaw prominent, but not produced. The length of the pectoral fin is only two-sevenths of the total length (without



caudal); insertion of the ventral midway between the root of the caudal and the axil of the pectoral.

Australian Seas (Gunther).

876. *EXOCÆTUS EVOLANS*, L.

Gunth., Cat. Fishes VI., p. 282.—White, Voy. N.S. Wales, pl. 52, fig. 2.

D. 13-14. A. 13-14. L. lat. 42. Vert. 25/19.

The height of the body is two-elevenths of the length (without caudal); the length of the head one-fourth. The depth of the head is less than the distance between the extremity of the snout and the hind margin of the præoperculum, and is contained once and three-fourths in its length. Snout obtuse and short, three-fourths the length of the diameter of the eye, which is nearly one-fourth of the length of the head, and somewhat less than the width of the interorbital space, which is quite flat. The pectoral fin extends to the root of the caudal. Ventral fin midway between the end of the snout and of the dorsal fin, terminating at a great distance from the vent. The dorsal fin commences a little in advance of the anal, its anterior rays not being half as long as the head. There are twenty scales between the occiput and the origin of the dorsal, and six longitudinal series of scales between the origin of the dorsal and the lateral line. Pectoral uniform blackish, with the lower border whitish. Ventrals white.

North Coast of Australia.

877. *EXOCÆTUS SPECULIGER*, Cuv. & Val.

Gunth., Cat. Fishes VI., p. 287.—Bleek., Atl. Ichth. Scembr., tab. 5., fig. 4.

D. 11-12. A. 12-13. L. lat. 50. Vert. 28/17.

The height of the body is one-sixth or nearly one-seventh of the length (without caudal); the length of the head two-ninths. The depth of the head equals the distance between the extremity

of the snout and the hind margin of the orbit. Snout rather produced, scarcely equal in length to the diameter of the eye, which is one-third of the length of the head, and less than the width of the interorbital space, which is slightly concave. The pectoral fin extends beyond the dorsal and anal, nearly to the rudimentary rays of the caudal. Ventral fins nearly midway between the eye and the root of the caudal, extending to the end of the base of the anal. The dorsal commences a little behind the origin of the anal, its anterior rays are half as long as the head. There are twenty-nine scales between the occiput and the origin of the dorsal fin, and six or seven longitudinal series of scales between the origin of the dorsal and the lateral line. Pectoral with an oblique white band across its lower half and with a broad whitish edge. Ventrals white, the middle rays greyish.

Australia (Gunther).

878. *EXOCÆTUS ROBUSTUS*, Gunth.

Gunth., Cat. Fishes VI., p. 289.

D. 14. A. 10. L. lat. 49.

The height of the body is two-elevenths of the length (without caudal); the length of the head two-ninths. The depth of the head equals the distance between the extremity of the snout and the hind margin of the orbit. Snout a little produced, scarcely equal in length to the diameter of the eye, which is two-sevenths of the length of the head, and less than the width of the interorbital space, which is quite flat. The pectoral fin extends beyond the dorsal and anal, nearly to the rudimentary rays of the caudal. Ventral fins nearly midway between the nostril and the root of the caudal, extending beyond the middle of the base of the anal. The dorsal fin commences far in advance of the anal; its anterior rays are not quite half as long as the head. There are twenty-eight scales between the occiput and the origin of the dorsal fin,

and eight longitudinal series of scales between the origin of the dorsal, and the lateral line. Pectoral fin with a broadish oblique whitish band across its anterior half, and with a whitish margin. Ventrals white, the middle rays greyish.

Australia (Gunther). Length sixteen inches.

879. *EXOCÆTUS NIGRIPINNIS*, Cuv. & Val.

Gunth., Cat. Fishes VI., p. 298.—Bleek., Atl. Ichth. Scombr., tab 5, fig. 1.

D. 10-11. A. 10-12. L. lat. 48-50.

The height of the body is one-sixth or a little less of the length (without caudal), the length of the head two-ninths, The depth of the head equals the distance between the extremity of the snout and the hind margin of the præoperculum. Snout obtuse and very short, scarcely more than half the length of the diameter of the eye, which is two-fifths of the length of the head, and is less than the width of the interorbital space, which is concave. The pectoral fin extends to the end of the dorsal, or root of the caudal. Ventral fin midway between the eye and the root of the caudal, extending nearly to the end of the tail. The dorsal commences above the origin of the anal, its anterior rays being more than half as long as the head. There are twenty-nine scales between the occiput and the origin of the dorsal fin, and six longitudinal series of scales between the origin of the dorsal and the lateral line. Pectoral and ventral fins black.

West. Australia. Warrior Reef (Chevert Exp.)

880. *EXOCÆTUS ATRODORSALIS*, Gunth.

Gunth., Ann. and Mag. Nat. Hist. 1867, Vol. XX., p. 67.

D. 8-9. A. 10. L. lat. 35.

The pectoral fin extends to the end of the dorsal. The ventral fin is scarcely nearer to the root of the caudal than to the end of the snout, extending to the origin of the anal. Dorsal fin

elevated, its longest anterior rays being as long as the head ; it commences in front of the anal. Upper pectoral rays blackish, lower whitish ; dorsal fin entirely black.

Cape York. Length five inches.

#### FAMILY VIII. CYPRINIDÆ.

Body generally covered with scales, head naked. Margin of the upper jaw formed by the intermaxillaries. Belly rounded, or if trenchant, without ossicles. No adipose fin. Stomach without blind sac. Pyloric appendages none. Mouth toothless ; lower pharyngeal bones well developed, falciform, subparallel to the branchial arches, provided with teeth, which are arranged in one, two or three series. Air-bladder large, divided into an anterior and posterior portion by a constriction, or into a right and left portion, enclosed in an osseous capsule. Ovarian sacs closed.

Fresh waters of the World.

#### GENUS NEOCARASSIUS, Casteln.

Scales large. Belly compressed into a sharp ridge behind the ventrals, the scales of one side not overlapping on the other. Dorsal fin short, with a strong serrated ray, behind the ventral ; anal fin short. Cleft of the mouth lateral. Barbels none. Allied to *Rohsteichthys*.

Australia.

881. NEOCARASSIUS VENTRICOSUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 237.

D. 21. A. 8. V. 8. P. 19. L. lat. 30. L. transv. 7/8.

Body very high and thick, with the belly very round and prominent ; the height is twice and a third in the total length ; the length of the head four times and a half ; the diameter of the orbit four-tenths of the length of the head. Large scales on the

infraorbital bone; lateral line straight. Caudal fin emarginate. Colour a golden green or red, with the under parts silvery-white.

Salt-water river, Melbourne. Two specimens, nine and ten inches in length.

Genus *LEUCISCUS*, Cuv.

Body covered with imbricate scales; lateral line generally complete, running in, or only a little below, the median line of the tail. Dorsal fin short without stiff ray, commencing opposite, rarely behind, the ventrals. Anal fin rather short or moderately developed, generally with from nine to eleven rays, rarely with eight, and still more rarely with fourteen rays. Mouth without structural peculiarities; lower jaw not trenchant; barbels none. Pseudobranchiæ. Pharyngeal teeth conical or compressed, in a single or double series. Intestinal tract short, with only a few convolutions.

Rivers of the Northern Hemisphere. Australia?

882. *LEUCISCUS* ? *AUSTRALIS*, Casteln.

Proc. Linn. Soc. N. S. W. Vol. III., p. 51.

Norman River.

FAMILY IX. *GONORHYNCHIDÆ*.

Head and body entirely covered with spiny scales; mouth with barbels. Margin of the upper jaw formed by the intermaxillary, which although short, is continued downwards as a thick lip, situated in front of the maxillary. Adipose fin none; the dorsal is opposite to the ventrals and short like the anal. Stomach simple, without blind sac; pyloric appendages in small number. Pseudobranchiæ; air-bladder absent. Gill-openings narrow.

Genus *GONORHYNCHUS*, Gronov.

Body elongate, subcylindrical; head pointed; snout conically projecting beyond the mouth, which is inferior and semicircular.

A single barbel behind the end of the snout; lips thick, fringed. Eye large, covered by the transparent skin. Teeth none in the jaws or on the palate; two patches of obtuse teeth behind the palate, on the pterygoid bones, opposed to a single larger patch on the hyoid. A lobe of the mucous membrane is suspended from the roof of the mouth, in front of the teeth. Dorsal fin opposite to the ventrals, these fins being approximate to the vent; caudal fin subtruncate. Gill-membranes grown to the isthmus. A fringed gill-like organ behind the fourth branchial arch, one half being attached to this arch, the other half to the humeral arch. Branchiostegals four.

South Africa. Australia. New Zealand, &c.

883. *GONORHYNCHUS GREYI*, Richards.

Gunth., Cat. Fishes VII., p. 373.

*Gonorhynchus brevis*, Kner., Voy. Novar., p. 342, pl. 16, fig. 1.

B. 4. D. 11-13. A. 9. V. 9. Cæc. pylor. 6-9.

Scales very small. The height of the body is about one-half of the length of the head, which is from two-ninths to one-sixth of the total length (without caudal). Terminal portion of the fins black, edged with white.

West Australia, South Australia, and Victoria.

#### FAMILY X. OSTEOGLOSSIDÆ.

Body covered with large hard scales, composed of pieces like Mosaic; head scaleless, its integuments nearly entirely replaced by bone; lateral line composed of wide openings of the mucus-duct. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. The dorsal fin belongs to the caudal portion of the vertebral column, and is opposite and very similar to the anal fin; both approximate to the rounded caudal, with which they are abnormally confluent. Gill-openings wide; pseudobranchiæ none; air-bladder simple or cellular. Stomach without cæcal sac; pyloric appendages two.

## Genus OSTEOGLOSSUM Vandelli.

Body more or less elongate, compressed, with the abdomen compressed into a trenchant edge; cleft of the mouth very wide, oblique, with the lower jaw prominent. A pair of barbels at the lower jaw. Maxillary very long, styliiform, scarcely protractile. Jaws with a series of small teeth; bands of rasp-like teeth on the vomer, palatine and pterygoid bones, on the tongue and hyoid. Pectoral fins elongate. Gill-membranes nearly entirely separate; branchiostegals rather numerous; air-bladder simple. Stomach without blind sac; two pyloric appendages.

Rivers of tropical America, Australia, and East Indian Archipelago.

## 884. OSTEOGLOSSUM LEICHARDTI, Gunth.

*Scleropages Leichardti*, Gunth., Ann. and Mag. Nat. Hist., 1864.

Vol. XIV., p. 196, pl. 7.—Cat. Fishes VII., p. 378.

“*Burramundi*” of the Aborigines of the Dawson River.

D. 20. A. 31. V. 5. L. lat. 35. L. transv. 3/4.

The length of the head is contained thrice and three-fourths in the total length (without caudal), and rather more than the distance between the pectoral and ventral fins. A distinct space between anal and caudal. Barbels very small.

Queensland Rivers. Length, from two to three feet.

## FAMILY XI. CLUPEIDÆ.

Body covered with scales; head naked; barbels none. Abdomen frequently compressed into a serrated edge. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally; maxillaries composed of three, sometimes moveable, pieces. Opercular apparatus complete. Adipose fin none. Dorsal not elongate; anal sometimes very long. Stomach with a blind sac; pyloric appendages numerous. Gill-



apparatus much developed, the gill-openings being generally very wide. Pseudobranchiæ large except in *Megalops*. Air-bladder more or less simple.

Genus ENGRAULIS, Cuv. & Val.

Body oblong, compressed. Scales large or of moderate size. Snout more or less conical, projecting beyond the lower jaw. Generally small teeth in the jaws, on the vomer, palatine and pterygoid bones. Intermaxillaries very small, hidden; maxillary long, attached to the cheek by a scarcely distensible membrane. Anal fin of moderate or great length. Union of the gill-membranes very short, leaving the isthmus uncovered, the gill-openings being extremely wide. Branchiostegals short, from nine to fourteen in number.

Temperate and tropical seas, entering rivers.

885. ENGRAULIS ANTARCTICUS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 365.

Victoria and Tasmania.

886. ENGRAULIS NASUTUS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 367.

Norman River.

Genus CHATOËSSUS, Cuv. & Val.

Body compressed, abdomen serrated. Scales of moderate size. Snout obtuse, or obtusely conical, more or less projecting beyond the cleft of the mouth, which is narrow, and more or less transverse. The maxillary is joined to the ethmoid bone, its upper portion being behind the intermaxillary. Teeth none. Anal fin rather long; dorsal opposite to the ventrals or to the space between the ventrals and anal. Gill-membranes entirely separate; branchial arches forming two angles, one pointing

forwards, the other backwards; the fourth branchial arch with an accessory organ; branchiostegals of moderate length, five or six in number.

Coasts and freshwaters of America, Australia and East Indies.

887. *CHATOËSSUS EREBI*, Richards.

Proc. Linn. Soc. N. S. Wales, Vol. IV., p. 368.

North and West Coasts.

888. *CHATOËSSUS RICHARDSONI*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 369.

Rivers of the Murray system.

Genus *BRISBANIA*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 241.

889. *BRISBANIA STAIGERI*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 241-3, pl. 3.

Brisbane River.

Genus *CLUPEA*, Cuv.

Body compressed, with the abdominal serrature extending forwards into the thoracic region. Scales of moderate or large, rarely of small size. Upper jaw not projecting beyond the lower. Cleft of the mouth of moderate width; teeth, if present, rudimentary and deciduous. Anal fin of moderate extent, with less than thirty rays; dorsal fin opposite to the ventrals. Caudal fin forked.

All seas; many species entering fresh waters.

890. *CLUPEA SAGAX*, Jenyns.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 371.

Tasmania, Victoria, New South Wales.

891. *CLUPEA SUNDAICA*, Bleek.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 373.

Port Jackson. Hawkesbury River.

892. *CLUPEA HYPSELOSOMA*, Bleek.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 375.

Port Jackson.

893. *CLUPEA MOLUCCENSIS*, Bleek.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 376.

Port Jackson.

894. *CLUPEA TEMBANG*, Bleek.

Proc. Linn. Soc., N.S. Wales, Vol. IV., p. 377.

Torres Straits (Chevert Exp.)

895. *CLUPEA NOVE-HOLLANDIÆ*, Cuv. & Val.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 378.

Nepean River.

896. *CLUPEA VITTATA*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 379.

Rivers of Victoria.

897. *CLUPEA RICHMONDIA*, Macl.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 380.

Richmond River.

898. *CLUPEA SCLEGELII*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 380.

899. *CLUPEA SPRATTUS*, L.

Gunth., Cat. Fishes VII., p. 419.—Proc. Zool. Soc., 1871, p. 672.

The "*Sprat*" or "*Garvie*" of England.

B. 6-7. D. 15-18. A. 17-20. V. 7. L. lat. 47-48. Vert. 47-49.

Scales deciduous, smooth. The height of the body is about equal to the length of the head. Lower jaw prominent, the maxillary extending to somewhat beyond the vertical from the front margin of the eye. An elongate ovate patch of very small teeth on the tongue, none on the vomer. Gill-rakers very fine, closely set, rather shorter than the eye. Ventral even with the origin of the dorsal. There are eleven or twelve abdominal scutes behind the root of the ventrals. Operculum without radiating striæ.

Tasmania (Gunther).

## Genus SPRATELLOIDES, Bleek.

Body slightly compressed or subcylindrical, elongate. Abdomen obtuse, without keel or serrature. Scales of moderate size, deciduous; lateral line none. Snout compressed, formed as in *Clupea*. Teeth none, or minute and deciduous. Anal fin short; dorsal opposite to the ventrals. Gill-membranes separate, with about six short flat branchiostegals. Pseudobranchiæ well developed. Pyloric appendages in moderate number; stomach with a long blind sac. Ovaries closed, with oviducts.

Indian and Australian seas. West Indies.

900. SPRATELLOIDES DELICATULUS, Beun.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 381.

Darnley Island (Chevert Exp.)

## Genus ETRUMEUS, Bleek.

Body elongate, subcylindrical; abdomen not compressed or serrated. Scales of moderate size, very deciduous; lateral line none. Snout pointed; jaws and mouth formed as in *Clupea*, but with the supplementary bones of the maxillary very narrow. Jaws

with small but fixed non-deciduous teeth; patches of villiform teeth on the vomer, the palatine and pterygoid bones, anal on the tongue. *Dorsal fin entirely in advance of the ventrals*; anal fin short. Gill-membranes entirely separate, with numerous fine branchiostegals; pseudobranchiæ well developed. Pyloric appendages numerous.

Japan; North Atlantic; Australia.

901. *ETRUMEUS JACKSONIENSIS*, Macl.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 36, pl. 4, fig. 1.

Port Jackson.

Genus *ELOPS*, L.

Body rather elongate, moderately compressed; abdomen flat. Scales small, adherent: lateral line distinct. A narrow osseous lamella, attached to the mandibular symphysis, covers the part between the mandibles. Snout pointed, mouth wide, anterior; intermaxillary short, maxillary forming the lateral part of the mouth. Bands of villiform teeth in the jaws, on the vomer, palatine and pterygoid bones, on the tongue and on the base of the skull. Dorsal fin opposite the ventrals; anal rather shorter than dorsal. Gill-membranes entirely separate, with very numerous branchiostegals. Pseudobranchiæ well developed. Pyloric appendages numerous.

Tropical and subtropical seas.

902. *ELOPS SAURUS*, L.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 382.

Port Jackson. North Coast.

Genus *MEGALOPS*, Lacep.

Body oblong, compressed; abdomen flat. Scales large, adherent; lateral line distinct. A narrow osseous lamella

attached to the mandibular symphysis between the mandibles. Snout obtusely conical; mouth anterior, lower jaw prominent; intermaxillary short, the maxillary forming the lateral part of the mouth. Bands of villiform teeth in the jaws, on the vomer, palatine and pterygoid bones, on the tongue and on the base of the skull. Dorsal fin opposite to, or immediately behind, the ventrals; anal rather longer than the dorsal. Gill-membranes entirely separate; with numerous branchiostegals. Pseudo-branchiæ none. Pyloric appendages numerous.

Tropical seas, entering rivers.

903. *MEGALOPS CYPRINOIDES*, Brouss.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 383.

Hawkesbury River.

Genus *CHANOS*, Lacep.

Body oblong, compressed; abdomen flat. Scales small, striated, adherent; lateral line distinct. Snout depressed; mouth small, anterior, transverse, the lower jaw with a small symphysial tubercle. Intermaxillary in juxtaposition to the upper anterior edge of the maxillary. Teeth none. Dorsal fin opposite to the ventrals; anal small, shorter than the dorsal; caudal deeply forked. Gill-membranes entirely united below, and free from the isthmus. Branchiostegals four, long. Pseudobranchiæ well developed. An accessory branchial organ in a cavity behind the gill-cavity proper. Air-bladder divided by a constriction into an anterior and posterior portion. Mucous membrane of the œsophagus raised into a spiral fold. Pyloric appendages numerous; intestine with many convolutions.

Indian and Pacific Oceans.

904. *CHANOS SALMONEUS*, Bl.

Proc. Linn. Soc. N.S. Wales, Vol. IV., p. 383.

Port Jackson (rare), North Coast.

## FAMILY XII. CHIROCENTRIDÆ.

Body covered with thin deciduous scales; barbels none. Margin of the upper jaw formed by the intermaxillaries mesially and by the maxillaries laterally, both bones being firmly united by *juxta-position*. Opercular apparatus complete. Adipose fin none; the dorsal fin belongs to the caudal portion of the vertebral column. Stomach with a blind sac; intestine short, the mucous membrane forming a spiral fold; pyloric appendages none. Pseudobranchiæ none; air-bladder incompletely divided into cells; gill-opening wide.

## Genus CHIROCENTRUS, Cuv.

Body elongate, compressed, with the abdomen trenchant; cleft of the mouth wide, oblique, with the lower jaw prominent. Lower jaw with a series of large canine teeth; intermaxillary with a pair of horizontal canines. Narrow bands of minute teeth on the palatine and pterygoid bones and on the tongue. Dorsal fin short, opposite to the anal, which is long. A long pointed osseous appendage at the base of the pectoral; ventral fins very small. Gill-membranes united for a short distance, with eight branchiostegals.

From Africa to China.

## 905. CHIROCENTRUS DORAB, Forsk.

Gunth., Cat. Fishes VII., p. 475.—Bleek., Atl. Ichth. Clup., tab. 11, fig. 3.

B. 8. D. 16-17. A. 33-34. V. 7. Vert. 29/46.

The height of the body is less than the length of the head, which is about two-elevenths of the total length exclusive of the caudal fin. Coloration uniform.

Port Jackson. Cape York. Length three feet.



## FAMILY XIII. ALEPOCEPHALIDÆ.

Body covered with thin cycloid scales; head naked; barbels none. Margin of the upper jaw formed by the intermaxillaries and maxillaries, the former being placed along the upper anterior edge of the latter. Opercular apparatus complete. Adipose fin none; the dorsal fin belongs to the caudal portion of the vertebral column. Stomach curved, without blind sac; pyloric appendages in moderate number. Pseudobranchiæ; air-bladder absent. Gill-openings very wide.

## Genus ALEPOCEPHALUS, Risso.

Body oblong, compressed; cleft of the mouth of moderate width with the jaws nearly even in front; a series of small teeth on the intermaxillaries, mandibles and palatine bones. Dorsal and anal fins subequal in length, opposite to each other; caudal emarginate. Bones thin. Gill-membranes entirely separate, with six branchiostegals.

Deep sea Fishes.

## 906. ALEPOCEPHALUS NIGER, Gunth.

Ann. and Mag. Nat. Hist., 1878, Vol. II., p. 248.

D. 21. A. 27.

Scales small. The length of the head is one-third of the total length without the caudal fin. Snout projecting beyond the mouth. Black.

North of Australia, 1,400 fathoms (Challenger).

## FAMILY XIV. SYMBRANCHIDÆ.

Body elongate, naked or covered with minute scales; barbels none. Margin of the upper jaw formed by the intermaxillaries only, the well developed maxillaries lying behind and parallel to them. Paired fins none. Vertical fins rudimentary, reduced to more or less distinct cutaneous folds. Vent situated at a great

distance behind the head. Ribs present. Gill-openings confluent into one slit situated on the ventral surface. Air-bladder none. Stomach without cæcal sac, or pyloric appendages. Ovaries with oviducts.

Genus SYMBRANCHUS, Bl.

Body naked. Four branchial arches with well developed gills. No accessory breathing sac. Gill-membrane free from the isthmus. Palatine teeth in a band.

Warm Seas.

907. SYMBRANCHUS GUTTURALIS, Richards.

Voy. Erebus and Terror, Fishes, p. 49, pl. 30, figs. 14-17.

Body cylindrical; tail compressed. The colour is of an uniform liver brown, slightly paler along the ventral line and darker towards the tip of the tail. The throat and cheeks with the snout are bluish-grey, mottled thickly with brown spots and lines. The eyes are small and situated near the snout.

Dampier's Archipelago. Port Darwin.

Dr. Gunther looks upon this species as identical with *Ophisternon bengalensis*, M'Clell., and *Symbranchus immaculatus*, Müller.

Genus CHILOBRANCHUS, Richards.

Body naked, compressed, subcylindrical in front, moderately elongate. Head small; snout very obtuse and short; mouth narrow, with the upper jaw slightly protractile; eye of moderate size. Teeth in the jaws in a single series; none on the palate. Gill-opening transverse, the gill-membrane not attached to the isthmus; hinder edge of the gill-opening with a raised lip. Four branchial arches, no slit behind the fourth; gills well developed; no accessory breathing-sac. Vent in the anterior half of the total length, with a minute papilla. Vertical fins reduced to a simple cutaneous fold, without rays. Intestinal tract straight—the

stomachal dilatation being longer than the intestine proper, and provided with a short caecal appendage near its upper end.

Australia.

908. *CHILOBRANCHIUS DORSALIS*, Richards.

Voy. Erebus and Terror, p. 50, pl. 30, figs. 1-5.—Gunth., Cat. Fishes VIII., p. 18.

The length of the head somewhat less than half the distance between the gill-opening and the vent. Colour blackish-brown, with a median dorsal line, and the dorsal and anal fins of a paler hue. Vert. 21/52.

N. W. Australia.

909. *CHILOBRANCHIUS RUFUS*, *n. sp.*

The length of the head is about one-third of the distance between the gill-opening and vent. The colour is red, with six or seven large blue or dark purple spots along each side becoming fainter towards the tail.

Port Jackson. Tasmania. Length under three inches.

FAMILY XV. MURÆNIDÆ.

Body elongate, cylindrical or band shaped, naked or with rudimentary scales. Vent situated at a great distance from the head. Ventral fin none. Vertical fins, if present, confluent, or separated by the projecting tip of the tail. Sides of the upper jaw formed by the tooth-bearing maxillaries, the fore part by the intermaxillary, which is more or less coalescent with the vomer and ethmoid. Humeral arch not attached to the skull. Stomach with a blind sac; no pyloric appendages. Organs of reproduction without efferent ducts.

SUB-FAMILY I. MURÆNIDÆ PLATYSCHISTÆ.

*The branchial openings in the pharynx are wide.*

## Genus ANGUILLA, Cuv.

Small scales are imbedded in the skin. Upper jaw not projecting beyond the lower. Teeth small, forming bands. Gill-openings narrow, at the base of the pectoral fins. The dorsal fin commences at a considerable distance from the occiput.

Seas and rivers of the whole World.

## 910. ANGUILLA REINHARDTII, Steind.

Gunth., Cat. Fishes VIII., p. 27.

The length of the head is contained once and one-third in the distance of the gill-opening from the origin of the dorsal fin, one-half of its distance from the vent, and conspicuously more than the distance between the commencement of the dorsal and anal fins. Snout long, depressed, spatulate; lips fleshy. The cleft of the mouth extends to the vertical from, or scarcely beyond, the hind margin of the eye, which is small. Vomerine teeth in a band, which is rather broad anteriorly, being broader in the middle than the maxillary band, and extending equally far backwards. The mandibular band of teeth is longitudinally divided by a narrow groove. Tail not much longer than the body. Upper parts greenish, with numerous black spots which disappear with age.

Sydney. Hawkesbury. Cape York. Richmond River.

## 911. ANGUILLA AUSTRALIS, Richards.

Voy. Erebus and Terror, p. 112, pl. 45, figs. 1-5.—Gunth., Cat. Fishes VIII., p. 36.

The dorsal fin commences at a very short distance in advance of the anal. The length of the head is contained twice and a third or twice and two-thirds in the distance of the gill-opening from the vent. Angle of the mouth below the posterior part of the eye. Lips fleshy. Teeth equally small, forming broadish, flat bands, the mandibular and vomerine bands being broader

than the maxillary band. The vomerine band does not extend so far backwards as the maxillary band. Tail rather longer than the body.

Tasmania, Victorian and N.S. Wales coasts and rivers.

#### Genus CONGER, Cuv.

Scaleless. Cleft of the mouth wide, extending at least to below the middle of the eye. Maxillary and mandibular teeth arranged in series, one of which contains teeth of equal size, and so closely set as to form a cutting edge; no canines; vomerine band short. Pectoral and vertical fins well developed; the dorsal commencing behind the root of the pectoral. Gill-opening large, approximate to the abdomen. The posterior nostril opposite to the upper or middle part of the orbit; the anterior in a tube. Eyes well developed.

Temperate and Tropical Seas.

#### 912. CONGER MARGINATUS, Val.

Gunth., Cat. Fishes VIII., p. 38.—Bleek., Atl. Ichth. Mur., pl. 23, fig. 2.

The dorsal fin commences conspicuously in advance of the extremity of the pectoral. Posterior nostril slightly below the level of the antero-posterior angle of the orbit. Upper jaw scarcely longer than the lower. The vomerine teeth reach backwards to or somewhat beyond the tip of the tongue. Greyish or blackish; vertical fins with a black edge; pectorals frequently with a black spot.

Torres Straits.

#### 913. CONGER VULGARIS, Cuv.

Gunth., Cat. Fishes VIII., p. 38.—Bleek., Atl. Ichth. Mur., pl. 5, fig. 2.

The dorsal fin begins opposite, or nearly opposite, to the extremity of the pectoral. Posterior nostril on a level with the

antero-superior angle of the orbit. Jaws nearly even in front. The vomerine teeth reach backwards nearly to the tip of the tongue. Body and pectoral fin immaculate.

Tasmania. Endeavour River.

914. CONGER WILSONI, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 193.

*Gymnothorax Wilsoni*, Bloch ?

The height of the body is about twenty times in the length ; the distance of the muzzle to the gill-opening eight times in the same. Head elongate. Teeth long, straight and placed close together, forming a cluster in front ; the anterior teeth are smaller than those behind ; a sharp crenulated ridge inside the row of teeth. The dorsal fin commences behind the extremity of the pectoral and is composed of about three hundred and twenty rays ; the anal commences a little before the middle of the entire length and has about two hundred and sixty rays, The pectorals are about one-fourth of the length of the head. Colour shining brownish-black, becoming greyish white on the belly. The lateral line is black and there are large, marbled, pinkish-white spots on the posterior part of the body.

Melbourne. Tasmania. Length four to five feet.

915. CONGER LABIATUS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 396.

Port Jackson.

Genus CONGROMURÆNA, Kaup.

Sacleless, Bones of the front part of the head with large muciferous cavities, Cleft of the mouth narrow, not extending backwards beyond the middle of the eye. All the teeth small, fine, forming bands ; those of the jaws not forming a cutting edge. Vomerine band narrow, long. Pectoral and vertical fins

well developed, the dorsal beginning nearly above the gill-opening. The posterior nostril opposite to the middle of the eye; the anterior with a very short tube. Eyes large.

Tropical and subtropical seas.

916. *CONGROMURENA HABENATA*, Richards.

Gunth., Cat. Fishes VIII., p. 42.—Richards., Voy. Erebus and Terror, pl. 50, fig. 1-5.

Upper jaw much projecting beyond the lower. Lips moderately developed; the cleft of the mouth extends nearly to below the middle of the eye. Tail rather longer than the body. Dorsal fin beginning immediately behind the base of the pectoral. Vertical fins with a narrow black margin.

Melbourne (once seen). Bondi (one specimen cast on beach).

Genus *MURENESOX*, M'Clell.

Scaleless. Snout produced. Jaws with several series of small closely set teeth; anteriorly with canines; vomer with several long series of teeth, the middle of which is formed by large conical or compressed teeth. Gill-openings wide, approximate to the abdomen. Pectoral and vertical fins well developed, the dorsal beginning above the gill-opening. Two pairs of nostrils, the posterior opposite to the upper part or middle of the eye.

Warm Seas.

817. *MURENESOX CINEREUS*, Forsk.

Gunth., Cat. Fishes VIII., p. 46.

*M. bagio*, Peters.—Bleek., Atl. Ichth. Mur., pl. 26, fig. 2.

“*The Silver Eel*” of Sydney Fishermen.

Vomerine teeth compressed, with a basal lobe in front and behind; the teeth of the inner series of the mandible similar in form to, and much smaller than, those of the vomer, and but



rarely with basal lobes; those of the outer series rudimentary, not bent outwards. Silvery.

Port Jackson.

Genus MYROPHIS, Lütken.

Nostrils on the margin of the upper lip, the anterior tubular. Pectoral fins well developed; vertical fins low, surrounding the tail; the dorsal commencing far behind the pectoral. Teeth bi- or tri-serial, uni-serial on the hinder part of the vomer.

Tropical Atlantic. Australia.

918. MYROPHIS CHRYSOGASTER, *n. sp.*

Length of the head about one-twelfth of the total length; length of tail twice that of the body, without the head. The dorsal fin appears to commence (it is so low as to be difficult of detection) about midway between the gill-opening and the vent. Snout rather long, rounded and rather depressed in front, the nasal tubes large. The teeth have a round molar appearance. The colour seems to have been reddish-brown, becoming yellowish on the belly. Length two feet.

Port Darwin.

919. MYROPHIS AUSTRALIS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 396.

Port Jackson.

Genus BLANCHARDIA, Casteln.

Body scaly and very elongate. Mouth broad; teeth in numerous series, pavement like, extending in a longitudinal line over the palate and posterior part of the mouth; nostrils in front of the eyes, not tubular. The dorsal fin commences a little behind the insertion of the pectorals and is continuous with the caudal and anal; pectorals rather large; vent a little nearer the

snout than to the base of the caudal fin. Gill-openings broad, extending under the posterior and inferior edges of the opercle.

Queensland.

920. *BLANCHARDIA MACULATA*, Casteln.

Researches on the Fishes of Australia, p. 47.

The scales on the body are small and disposed in oblique transverse lines. The length of the head is eight times and one-third in the total length; the caudal fin is longer than the pectoral and equal to the height of the body. Colour (in spirits) light lilac, covered with minute dark brown spots; lower part of the head and body yellow and immaculate.

Queensland. Length five inches.

Genus *MURÆNICHTHYS*, Bleek.

Body long, cylindrical, vermiform. Nostrils on the margin of the upper lip. No pectoral fins. Dorsal fin low or rudimentary, commencing at a great distance behind the gill-opening. Gill-opening narrow. Eyes small.

East Indian Archipelago. Australia.

921. *MURÆNICHTHYS AUSTRALIS*, *n. sp.*

Body very slender, its depth being about one-sixtieth of its length, the length of the head is one-fifteenth. The dorsal fin is scarcely visible and commences exactly over the vent, the distance from the vent to the muzzle is one-fourth less than that from the vent to the extremity of the tail. Snout pointed, the upper jaw much exceeding the lower; teeth equal, regular and cardiform; the eye rather behind the middle of the cleft of the mouth. Colour reddish-yellow. Length ten inches.

Lane Cove, Port Jackson.

922. *MURÆNICHTHYS BREVICEPS*, Gunth.

Ann. and Mag. Nat. Hist., 1876, Vol. XVII., p. 401.

The origin of the dorsal fin is twice as distant from the vent as from the gill-opening. The length of the head is only one-third or two-sevenths of the distance of the gill-opening from the vent or one-eleventh of the total length. Snout very long and narrow, the cleft of the mouth extending to behind the eye. Teeth bi-serial.

Tasmania. Length twenty inches.

Genus *OPHICHTHYS*, Gunth.

The extremity of the tail free, not surrounded by the continuation of the dorsal and anal fins. Teeth on the vomer as well as in the jaws.


Warm Seas.

923. *OPHICHTHYS SERPENS*, L.

Gunth., Cat. Fishes VIII., p. 65.

The length of the head is contained thrice and two-thirds or four times in the distance between the gill-opening and the vent. Snout slender, produced into a point; cleft of the mouth very wide, half as long as the head. Eye of moderate size, two sevenths of the length of the snout, situated in the anterior third of the head. Teeth pointed, fixed, unequal in size, those of the intermaxillary and maxillary bi-serial, the others uni-serial. The intermaxillary teeth, the anterior ones of the mandible and those of the vomer, are canines. Gill-openings rather wide. Vertical fins moderately developed; the distance between the base of the pectoral and origin of the dorsal is twice or rather more than twice the length of the pectoral, which is about one-sixth of that of the head. The length of the body is somewhat more than half the length of the tail. Silvery, brownish-red above, whitish beneath.

Lane Cove, Port Jackson.



924. *OPHICHTHYS CEPHALOZONA*, Bleek.

Atl. Ichth. Mur., p. 49, pl. 12, fig. 2.—Gunth., Cat. Fishes VIII.,  
p. 69.

Body purplish-brown; nape with a very broad, deep black cross band broadly edged with white in front and behind. Dorsal and anal fins tricoloured—brownish along the base, black along the middle, and white along the margin. The length of the head is one-fourth of the distance of the gill-opening from the vent. Cleft of the mouth of moderate width, slightly extending behind the eye; snout pointed, with the upper jaw much projecting beyond the lower. Eye of moderate size, one-half the length of the snout, situated in the anterior third of the head. Posterior nostril in advance of the eye, anterior with a broad tube. The intermaxillary teeth are stout, forming an irregular group; these and a pair in front of the lower jaw, are stouter than the others, which are pointed, fixed and uni-serial. The length of the pectoral fin is rather more than one-fourth of that of the head; the dorsal commences above the end of the pectoral. Tail sometimes longer sometimes shorter than the body.

Cape York (Damel.).

925. *OPHICHTHYS CALAMUS*, Gunth.

Gunth., Cat. Fishes VIII., p. 74.

The length of the head is one-fifth of the distance of the gill-opening from the vent. Snout convex, obtusely conical; cleft of the mouth of moderate width, one-fourth of the length of the head; eye rather small, one-half of the length of the snout, situated above the middle of the mouth. Teeth small, uni-serial, apparently in two series on the vomer. Lips fringed. Gill-openings narrow, and close together. Fins moderately developed. The dorsal fin commences at a short distance behind the angle of the mouth; pectoral fin one-fourth of the length of the head.

Tail nearly twice as long as the body. Brownish; lower parts whitish.

West Australia.

926. *OPHICHTHYS CANCRIVORUS*, Richards.

Voy. Erebus and Terror, p. 97, pl. 50, figs. 6-9.—Gunth., Cat. Fishes VIII., p. 78.

Coloration uniform. The length of the head is two-fifths or nearly one-third of the distance of the gill-opening from the vent; the length of the body from three-fourths to nearly two-thirds of that of the tail. Cleft of the mouth rather wide, about one-third of the length of the head; snout depressed, somewhat pointed. Eye of moderate size, nearly one-half of the length of the snout. Teeth granular, forming broadish bands. Length of the pectoral fin about two-sevenths or one-third of that of the head; dorsal commencing above the middle of the pectoral; dorsal and anal fins of moderate depth. A more or less distinct blackish spot anteriorly on the dorsal fin.

Port Essington

927. *OPHICHTHYS ELAPSOIDES*, Casteln.

Researches on the Fishes of Australia, p. 47.

The length of the head is equal to one-third of the distance of the gill-opening from the vent, and is contained nine times in the distance of the vent from the extremity of the tail. Snout long and pointed; upper jaw much longer than the lower; cleft of the mouth extending beyond the eye, which is very small. Teeth tubercular, covering the palate. Pectoral fin very small; the dorsal commences immediately behind the nape; dorsal and anal fins very low, not easily seen; the anal terminating at some distance from the extremity of the tail. Head yellow, with broad black transverse bands: one on the snout, one over the eye, a third on the back of the head, and one over the opercles, the

body is scarlet, with twenty broad black bands, becoming narrower on the belly.

Cape York. Length nineteen inches.

928. *OPHICHTHYS EPISCOPUS*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 244.

Moreton Bay.

SUB-FAMILY II. *MURÆNIDÆ ENGYSCHISTÆ.*

*The branchial openings in the pharynx are narrow slits.*

Genus *MURÆNA*, Cuv.

Scaleless. Teeth well developed. Gill-openings narrow. Pectoral fins none; dorsal and anal well developed. Two nostrils on each side of the upper surface of the snout; the posterior a narrow round foramen, with or without tube, the anterior in a tube.

Temperate and Tropical Seas.

929. *MURÆNA HELENA*. L.

Richards. Voy. Erebus and Terror, p. 80, pl. 49, f. 1-6.—Gunth. Cat. Fishes VIII., p. 96.

Posterior nostrils tubular; anterior nasal tubes of moderate length, being about equal to the vertical diameter of the eye. Teeth uni-serial. Intermaxillary and mandibular canine teeth but little larger than the lateral teeth; anterior vomerine teeth much the largest, seventeen to eighteen teeth on each side of the lower jaw. Gill-opening a small horizontal slit. Snout rather pointed; eye small, two-fifths of the length of the snout, situated above the middle of the length of the mouth. Cleft of the mouth wide, its length being about two-thirds of the distance between the angle of the mouth and the gill-opening. Tail a little longer than the body; the length of the head two-fifths of

that of the trunk. Brown, with large whitish or yellowish spots, each of which contains smaller brown spots. Head and neck brown variegated with whitish. Gill-opening in a small brown spot; tail with a narrow white edge. Sometimes almost entirely brown, with small whitish spots more or less arranged in rings.

Australian Seas. (Sir John Richardson.)

930. *MURÆNA TESSELATA*, Richards.

Gunth., Cat. Fishes VIII., p. 106.—Bleek., Atl. Ichth. Mur., pl. 27-28, fig. 13.

Teeth uni-serial, young specimens with additional teeth, forming an inner maxillary series. Canines moderately developed; the mouth can be shut completely. Anterior nasal tubes much shorter than the vertical diameter of the eye. Gill-opening wider than the eye. Snout compressed, of moderate length; *eye rather small*, rather less than half the length of the snout, situated above the middle of the cleft of the mouth. Cleft of the mouth wide, its width being contained twice and one-third in the length of the head. Tail nearly as long as the body; *the length of the head is one-third of that of the trunk*. Head, body, and fins with large polygonal or rounded black spots separated by narrow white lines, or by distinct interspaces of the ground colour, all or most of the spots being wider than the interspaces (as in var. *isingteena*).

Endeavour River.

931. *MURÆNA UNDULATA*, Lacép.

Gunth., Cat. Fishes VIII., p. 110.

*M. cancellata*, Richards., Voy. Ereb. and Terr., p. 87, pl. 46, f. 1-5.

Teeth uni-serial, sometimes two additional teeth forming an inner maxillary series; mandibular teeth from twenty-six to thirty in number on each side (in adults); canines strong, normally



four pairs in the lower jaw, also two of the maxillary teeth are canines. *The mouth cannot be shut completely.* Anterior nasal tubes short. Gill-opening not wider than the eye. *Snout produced, pointed.* *Eye rather large,* more than half the length of the snout, situated above the middle of the cleft of the mouth. Cleft of the mouth very wide, one-half, or nearly so, of the length of the head. Tail contained twice and one-third in that of the trunk. Ground colour brown, or brownish-black; the head and anterior part of trunk with irregular more or less distinct dark spots. Undulated, and partly reticulated, chiefly subvertical yellowish lines over the body and fins, becoming more distinct towards and on the tail. These lines are sometimes limited to the posterior part of the tail, and the body is sometimes mottled irregularly with brown (as in var. *Agassizii*). Gill-opening without black spot; *fins not white-edged.*

Port Jackson. Torres Straits (Chevert Exp.).

932. *MURÆNA MACASSARIENSIS*, Bleek.

Gunth., Cat. Fishes VIII., p. 111.—Bleek., Atl. Ichth. Mur., p. 104, pl. 37, fig. 3.

Teeth uni-serial, sometimes two additional teeth forming an inner maxillary series; mandibular teeth about twenty on each side; canines rather strong, *but the mouth can be shut completely.* Anterior nasal tubes short. Gill-openings narrower than the eye. Snout somewhat produced, not twice so long as the eye, which is large and situated above the middle of the cleft of the mouth. Cleft of the mouth very wide, one-half of the length of the head. Tail scarcely longer than the body. The length of the head is contained twice and two-thirds in that of the trunk. Brown, with very fine vermiculated white lines, forming an irregular network, the area of each mesh darker in the centre. *Gill-opening without black spot.* *Fins with a narrow white margin.*

Cape York (Damel).

## 933. MURENA PICTA, Bl.

Gunth., Cat. Fishes VIII., p. 116.—Bleek. Atl. Ichth. Mur.,  
pl. 26-28-29-45.

*M. siderea*, Richards. Voy. Erebus and Terror, p. 85, pl. 48,  
figs. 1-5.

Maxillary and intermaxillary teeth in a single series; *only one or two anterior vomerine teeth, which are not subulate, and not larger than the intermaxillary teeth.* The vomerine series is generally distinctly bifurcate anteriorly. Mandibulatory teeth uni-serial, only the anterior subbi-serial. No distinct canine teeth. Anterior nasal tubes not quite as long as the vertical diameter of the eye. Snout of moderate length; eye small, less than one-half the length of the snout, situated above the middle of the cleft of the mouth, the length of which is nearly one-third of that of the head. Tail about as long as the body; the length of the head is contained twice and two-thirds in that of the trunk. Brownish-grey, with an infinite number of very small black spots separated by a fine light network; sometimes the spots are more or less confluent into larger irregular spots, giving a marbled appearance. Young specimens lighter coloured, with blackish ringshaped marks.

Port Jackson. Moreton Bay.

## 934. MURENA NUBILA, Richards.

Voy. Erebus and Terror, p. 81, pl. 46, fig. 6-10.—Gunth. Cat.  
Fishes, VIII., p. 117.

Skin smooth. Teeth uni-serial, without basal lobe; mandible with from fourteen to sixteen teeth on each side; canines moderately developed, the mouth shutting completely. The length of the anterior nasal tubes is rather less than the vertical diameter of the eye. Snout compressed, somewhat produced, eye small, one-half or two-fifths of the length of the snout, situated a little nearer to the angle of the mouth than to the end

of the snout. Gill-opening as wide as the eye. Tail a little longer than the body; the length of the head is contained twice and one-half or twice and two-thirds in that of the trunk. Gill-opening without large black spot. Brownish, with irregular dark brown blotches, more or less confluent into transverse band-like spots. Anal fin with a black and white margin. Angle of the mouth brown, with a more or less distinct white spot in front.

Norfolk Island.

935. *MURÆNA RICHARDSONII*, Bleek.

Atl. Ichth. Mur., p. 100, pl. 42, fig. 2.—Gunth., Cat. Fishes VIII., p. 118.

Skin distinctly folded, the folds crossing each other and forming scale pouches. Teeth of old examples uni-serial, without basal lobe; in younger examples the anterior mandibular and maxillary teeth, and also sometimes the vomerine teeth, are bi-serial. Mandible with from ten to fourteen teeth on each side. Canines rather small; the mouth can be shut completely. The length of the anterior nasal tubes is rather less than the vertical diameter of the eye. Snout compressed, of moderate length. Eye of moderate size. Gill-opening as wide as the eye. Tail a little longer than the body. The length of the head is contained twice and one-third in that of the trunk. Gill-opening without black spot. Brownish, marbled with darker on the back, the dark colour forms an incomplete network of wide meshes, and the tail is crossed by dark cross-bands. Young specimens without, large specimen with, a white edge to the anal fin.

Houtman's Abrolhos, West Australia.

936. *MURÆNA FLAVOMARGINATA*, Rüpp.

Gunth., Cat. Fishes VIII., p. 119.—Bleek., Atl. Ichth. Mur., p. 95, pl. 32 and 34, fig. 2-3.

Teeth uni-serial, except the vomerine series, which is forked in front. Canines of moderate size, the mouth shutting completely. Mandible with from eighteen to twenty-two teeth on each side, the two anterior being canines. Anterior nasal tubes very short. Snout rather high, of moderate length. Eye small, one-half or two-fifths of the length of the snout, situated above the middle of the cleft of the mouth, which is two-fifths of the length of the head. Gill-opening wider than the eye. Tail as long as the body. The length of the head is contained thrice and one-third, or thrice and four-fifths in that of the trunk. Gill-opening in a black spot. Body brown, densely marbled with black; head and end of the tail quite black. Sometimes two black depressed lines along the anal fin; fins frequently with a white edge.

Norfolk Island (Jukes).

937. *MURÆNA CALLORHYNCHA*, Gunth.

Gunth., Cat. Fishes, VIII., p. 122.

Maxillary teeth, and the anterior of the mandible bi-serial; the others uni-serial. Canines short. Mandible with about twenty closely set teeth in the outer series on each side. Snout of moderate length, obtuse, nearly thrice as long as the eye, which is small. Gill-opening still narrower than the eye. The length of the cleft of the mouth is contained twice and one-third in that of the head. Fins very low, the dorsal commencing behind the gill-opening. Tail a little longer than the body. The length of the head is contained thrice and three-fourths in that of the trunk. Nearly uniform greyish-olive (in spirits); snout white with a brown band on each side, running from above the orbit over the front nostril to the edge of the upper lip.

Freemantle, West Australia.

938. *MURÆNA AFRA*, Bl.

Gunth., Cat. Fishes, VIII., p. 123.—*M. prasina*, Richards. Voy. Erebus and Terror, p. 93.

Teeth uni-serial in old examples, except the vomerine which are sometimes bi-serial; in young examples generally all bi-serial. Mandible with about twenty teeth on each side, the four anterior much longer than the others and like the canines rather elongate. Anterior nasal tubes half as long as the eye. *Gill-opening nearly as wide as the eye.* Snout narrow, produced, pointed. Eye of moderate size, half the length of the snout, situated somewhat nearer to the angle of the mouth than to the end of the snout. Cleft of the mouth wide, two-fifths of the length of the head. Tail longer than the body. The length of the head is contained twice and one or two-thirds in that of the trunk. Dorsal fin not elevated. Brownish-black; fins without light edge. Colour in fresh specimens, green.

Port Jackson. Australian coasts.

939. *MURÆNA NEBULOSA*, Bl.

Gunth., Cat. Fishes, VIII., p. 130.

*M. variegata*, Richards. Voy. Erebus and Terror, p. 94, pl. 47, f. 11-16.

Teeth obtuse, molar-like. Yellowish, with fine vermiculated black lines, and two series of large black spots. the upper running along the side of the back, the lower along the lower half the body; each spot includes one or more white spots; more or less regular black bands cross the abdomen connecting the spots of the lower series. The black spots are sometimes reduced to starlike figures.

Torres Straits. (Chevert Exp.)

940. *MURÆNA PSEUDOTHYRSOIDEA*, Bleek.

Atl. Ichth. Mur. p. 104, pl. 46, fig. 2.—Gunth., Cat. Fishes, VIII., p. 112.

Teeth uni-serial; mandible with about eighteen teeth on each side; canines moderately developed; the mouth cannot be shut

completely. Gill-openings not larger than the eye. Snout of moderate length, twice as long as the eye, which is rather small, and nearer to the end of the snout, than to the angle of the mouth. Cleft of the mouth wide, its length being contained twice and one-fourth in that of the head. Tail not quite so long as the body. The length of the head is two-fifths of that of the trunk. Brown with very fine vermiculated white lines forming an irregular network. *Gill-opening without black spot; fins without white margin.*

Darnley Island. (Chevert Exp.)

941. *MURÆNA FIMBRIATA*, Benn.

Gunth., Cat. Fishes, VIII., p. 108.—*M. bullata*, Richards.

*M. isingleenoides*, Bleek. Atl. Ichth. Mur. p. 91, pl. 35, fig. 1.

Teeth uni-serial, without basal lobe; younger examples sometimes with two or three additional teeth, forming an inner maxillary series. Canines well developed, but the mouth can be shut almost completely. Anterior nasal tubes much shorter than the vertical diameter of the eye. Gill-opening not wider than the eye. Snout narrow, somewhat produced; *eye of moderate size*, half the length of the snout, situated above the middle of the cleft of the mouth. Tail a little longer than the body, the length of the head is contained twice and one-fourth or one-third in that of the trunk. Body and tail with three more or less regular longitudinal series of round black spots, mostly larger than the eye but smaller than the interspaces. Fins with a white margin. Head with small black spots.

Port Essington. Torres Straits. (Chevert Exp.)

942. *MURÆNA MELANOSPILA*, Bleek.

Atl. Ichth. Mur., p. 90, pl. 42, fig. 1.—Gunth., Cat. Fishes, VIII., p. 109.

Teeth uni-serial, without basal lobe; about nineteen on each side of the mandible. Canines much larger than the other teeth and the jaws do not shut. Anterior nasal tubes very short. Gill-opening wider than the eye. Snout short and compressed; eye small, one-half of the length of the snout, situated above the middle of the cleft of the mouth, the length of which is contained twice and two-thirds in that of the head. Tail a little longer than the body, the length of the head is one-third of that of the trunk. Brown, body and tail with round or oval black spots, generally larger than the eye, longitudinally arranged. Spots on the head much the smallest. Fins with a narrow white edge.

Darnley Island. (Chevert Exp.)

Genus GYMNUMURÆNA, Bleek.

Sacleless. Teeth numerous, small, pointed. Gill-openings narrow. Fins none, except a rudimentary one round the end of the tail. Two pairs of nostrils on the upper surface of the snout, the posterior being a small round foramen.

Tropical Seas.

943. GYMNUMURÆNA CONCOLOR, Rüpp.

Gunth., Cat. Fishes, VIII., p. 134.

Uniform brown. Maxillary and mandibular teeth in a double series; no distinct canine teeth. Eye of moderate size; posterior nostrils not tubular. Tail but little longer than the body.

Cape York. (Damel.)

Dr. Bleeker and Dr. Gunther both include in this family a very remarkable form of Fishes under the name of *Leptocephalus* Gronov. They are believed by some to be the larval form of a *Conger*, but in truth little seems to be known about them.



## Genus LEPTOCEPHALUS, Gronov.

Form compressed, elongate, band-shaped, body pellucid, becoming white in spirits, like a tape worm; skeleton entirely cartilaginous. Fins generally rudimentary.

Found floating in the sea.

## 944. LEPTOCEPHALUS MORRISII, Gm.

Gunth., Cat. Fishes, VIII., p. 139.—*L. altus*, Richards. Voy. Erebus and Terror, p. 51, pl. 30, figs. 8-10. (Perhaps another species.)

Body compressed, its depth being about equal to the length of the head. Sometimes the body sometimes the tail the longer. End of the tail generally rounded. Snout obtusely rounded. Eye rather large. Tongue distinct. Pectoral fins developed. Jaws with or without small teeth. Chorda dorsalis without ossifications.

Australia. (Haslar Collection.)

## FAMILY XVI. PEGASIDÆ.

Body entirely covered with bony plates, anchylosed on the trunk and moveable on the tail. Barbels none. The margin of the upper jaw is formed by the intermaxillaries and their cutaneous prolongation, which extends downwards to the extremity of the maxillaries. Gill-cover formed by a large plate, homologous to the operculum, præoperculum and suboperculum; interoperculum a long fine bone, hidden below the gill-plate. One rudimentary branchiostegal. The gill-plate is united with the isthmus by a narrow membrane; gill-opening narrow, in front of the base of the pectoral fin. Gills four, lamellated. Pseudo-branchiæ and air-bladder absent. One short dorsal and anal fin, opposite to each other. Ventral fins present. Ovarian sacs closed.

## GENUS PEGASUS, L.

Body broad, much depressed. Pectoral fins horizontal, broad, long, composed of simple rays, some of which are sometimes spinous. Ventral fins one or two-rayed, the outer ray being long. Upper part of the snout produced into a longer or shorter process. Mouth inferior, toothless. Suborbital ring well developed, forming a suture with the gill-cover. Intestinal tract rather short with one or two complete circumvolutions. Vertebrae not numerous, thin; ribs none.

Indian and Australian Seas.

## 945. PEGASUS NATANS, L.

Gunth., Cat. Fishes, VIII., p. 148.

D. 5. A. 5. P. 11. V. 3. Vert. 7 + 14.

Tail (without caudal fin) as long as, or longer than, the body to the end of the snout. Tail composed of twelve rings, tapering and very much flattened behind. Ridges on the upper side of the body obtuse, without tubercles; shields uniformly finely granulated. Pectoral rays equally slender. Snout prolonged into a long flat sword-like process, truncated in front and denticulated on the side, the teeth directed backwards. Tail with broad brown cross-bands, one below the dorsal being the most constant. Dorsal and pectoral fins with brown spots.

Moreton Bay. Torres Straits.

## 946. PEGASUS LANCIFER, Kaup.

Gunth., Cat. Fishes VIII., p. 149.

D. 5. A. 5. P. 15. V. 2.

Tail (without caudal fin) much longer than the body to the end of the snout, composed of fourteen or fifteen rings, of which the six posterior are more or less confluent, much depressed, tape-like. The trunk is broad, exceedingly depressed, nearly flat above, with narrow vertical sides. The dorsal ridges are usually

linear, and from the centre of each shield radiate raised lines, forming star-like figures. Pectoral rays equally slender. Snout prolonged into a very thin, four-ridged process, about twice as long as the orbit; the ridges are beset with minute spines. Upper parts nearly uniform brown.

Tasmania.

#### ORDER V. *LOPHOBRANCHII*.

*The gills are not laminated, but composed of small rounded lobes, attached to the branchial arches. Gill-cover reduced to a large simple plate. Air-bladder simple, without pneumatic duct. A dermal skeleton, composed of numerous pieces arranged in segments, replaces more or less soft integuments. Muscular system not much developed. Snout produced. Mouth terminal, small, toothless, formed as in Acanthopterygians.*

#### FAMILY SYNGNATHIDÆ.

Gill-openings reduced to a very small opening near the upper posterior angle of the gill-cover. One soft dorsal fin; no ventrals, and sometimes one or more of the other fins also absent.

#### First Group *Syngnathina*.

Tail, *not* prehensile, generally with a caudal fin.

#### Genus SYNGNATHUS, Artedi.

Body with the ridges more or less distinct, the dorsal edge of the trunk not being continuous with that of the tail. Pectoral fins well developed, caudal present. Dorsal fin opposite, or near to vent. Humeral bones firmly united into the "breast ring." Males with an egg pouch on the tail, the eggs being covered by cutaneous folds.

Temperate and Tropical Coasts.

## 947. SYNGNATHUS SEMIFASCIATUS, Gunth.

Gunth., Cat. Fishes VIII., p. 162.—*L. semistriatus*, Kaup.

D. 38. Osseous rings 21 + 49.

Lateral line interrupted. Adult females have the trunk strongly compressed and rather elevated, its depth being one-fifth of its length. The length of the snout is equal to the distance of the anterior margin of the eye from the middle of the second body ring. Head with fine striæ, but without ridges. Shields smooth. The length of the body is contained once and one-third in that of the tail. Vent below the end of the anterior third of the dorsal fin. Caudal fin well developed. Upper part of the trunk with numerous, very small, light, dark edged ocelli, the lower part with a narrow brown vertical bar on each ring. A white stripe, edged with black above and below, runs from the lower part of the snout, through the eye, over the gill-cover.

South Australia, Tasmania, and Port Phillip.

## 948. SYNGNATHUS PELAGICUS, L.

Gunth., Cat. Fishes VIII., p. 165.

D. 29-31. Osseous rings 17 + 32-35.

The length of the snout equals the distance of the front margin of the orbit from the root of the pectoral fin. A distinct ridge along the median line of the nuchal shields; supraorbital ridge not continued over the temple; anterior part of the operculum with a faint ridge. Shields without spines. Lateral line interrupted. Tail longer than the body; caudal pouch short, about half as long as the body. Dorsal fin commencing somewhat in advance of the vent. Caudal well developed. Lower half of the side of the abdomen with vertical silvery bars, becoming broader and of a whitish colour on the upper half. Brown cross bands are placed alternately between the silvery bars, so that the brown bands are grouped together in twos or threes, the bands of each group more or less confluent. In males the silvery bars are

represented by spots; a brown band through the eye and along the snout. Dorsal fin with oblique brown bands.

South Australia.

949. SYNGNATHUS GRAYII, Kaup.

Gunth., Cat. Fishes, VIII., p. 169.

D. 20. Osseous rings 18 + 35.

Base of the dorsal fin elongated. The length of the snout is less than one-half of that of the head; it is provided with series of minute spines; forehead rather high, its profile abruptly descending towards the snout. Occiput and neck elevated into a crest; eyes large, prominent; edge of the orbit rough. Operculum with radiating striæ, and a strong ridge bent upwards; humerus with a trihedral prominence. Body not deeper than broad; shields without spines, but the ventral edges of the caudal rings forming the pouch are horizontally dilated. Tail one-half longer than the body. Vent below the middle of the dorsal fin, which stands on four rings. Caudal fin very small. Egg-pouch at least half as long as the tail. A deep brown spot on the side of the fourth body ring.

Australia? (Gunther).

950. SYNGNATHUS MARGARITIFER, Peters.

Gunth., Cat. Fishes, VIII., p. 171.

D. 21-23. Osseous rings 20 + 35-37.

Operculum crossed by a straight ridge. The length of the snout is somewhat more than half that of the head. A low ridge along the median line of the snout, and of the crown of the head and neck; supraorbital edge continued into a feeble ridge on the side of the crown. Shields without spines. Tail about twice as long as the trunk. *Dorsal fin occupying two body and four or five tail-rings.* Pouch extending to or beyond the sixteenth tail-ring. Brown with mother of pearl coloured dots.

Port Jackson.

## 951. SYNGNATHIUS PÆCILOLEMUS, Peters.

Gunth., Cat. Fishes VIII., p. 174.—Casteln., Proc. Zool. Soc., Victoria, Vol. II., p. 78.

D. 28. Osseous rings 20 + 49.

Operculum with a straight ridge. Snout nearly twice as long as the postorbital part of the head. A low ridge along the median line of the snout and of the crown of the head and neck; supra-orbital edge continued into a feeble ridge on the side of the crown. Shields without spines. Tail more than twice as long as the trunk. Dorsal fin occupying the anal and six caudal rings. Lower side of the head with dark spots; body with very small ocellated dots.

South Australia.

## 952. SYNGNATHIUS CURTIROSTRIS, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 79.

D. 20. Osseous rings 18 + 42.

The length of the snout is contained twice in the rest of the head and is once and a half the diameter of the orbit. Head one-twelfth of the total length. The snout has a strong longitudinal ridge on its upper part, and a feeble one on each side; the operculum is covered with deep, punctured, radiating striæ, with its upper edge elevated like a curved ridge; but no longitudinal ridge on its surface. The body is quadrilateral, with a faint ridge on each side, extending to the vent; on the first rings of the tail there is an oblique ridge, which runs into the upper edge on the fifth ring. The dorsal fin occupies the first five tail rings; the caudal is longer than the two last tail rings, is rounded and formed of six rays. Colour (in spirits) dark brown, with irregular silvery spots on the lower part of the head and the first few segments of the body; these spots are surrounded by a dark line; the pectoral and dorsal fins are of a

light colour, speckled with brown. Length four and a half inches.

South Australia.

953. SYNGNATHUS BREVICAUDIS, Casteln.

Researches Fishes of Australia, p. 48.

D. 25. Osseous rings 20 + 28.

Operculum without ridge; base of dorsal fin elevated. Snout straight, its length more by half than the rest of the head; the interorbital space broad and concave, with several small ridges, the operculum with small radiating ridges; body rather deeper than broad; shields without spines; tail once and a half as long as the body without the head. Vent nearly below the middle of the dorsal fin; the ventral ridge of the body meets the lower caudal ridge at the vent; the tail continues very thick to its extremity, which is abruptly rounded and furnished with a very small caudal fin. The pectoral fins are large, of sixteen rays; the dorsal fin extends over seven shields. Dark brown, (dried) variegated with white; snout white.

Swan River. Length six inches.

954. SYNGNATHUS TIGRIS, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 39.

Port Jackson.

955. SYNGNATHUS INTESTINALIS, Rams.

Proc. Linn. Soc. N.S. Wales, Vol. V., p. 494.

Genus *ICHTHYOCAMPUS*, Kaup.

The dorsal edges of the trunk and tail are continuous, but sometimes very indistinct. Pectoral and caudal fins present. Dorsal fin opposite or near to the vent. Males with an egg-pouch on the tail, the eggs being covered by cutaneous folds.

Indian and Australian Seas.



956. *ICHTHYOCAMPUS SCALARIS*, Gunth.

Gunth., Cat. Fishes VIII., p. 177.

D. 25. Osseous rings 19 + 39.

Operculum without ridge. The length of the head is about one-ninth of the total; snout half as long as the head in adult examples, and as long as the postorbital portion in young. Upper part of the head with scarcely a trace of a ridge along the nuchal shields. Body as deep as broad, with very obtuse ridges. Tail twice as long as the trunk. Dorsal fin standing on seven rings, three of which belong to the body. Caudal very short. Body and tail with from thirteen to fifteen irregular broad brown cross-bands, more distinct in young than in adult examples. A narrow brown cross bar on the suture between every two ventral shields. Lower side of the head and breast with deep brown dots.

Freyinet's Harbour (Herald).

957. *ICHTHYOCAMPUS FILUM*, Gunth.

Gunth., Cat. Fishes VIII., p. 178.

D. 14. Osseous rings 16 + 47-48.

Head and snout very short, the length of the former being two-fifths of its distance from the vent. Snout turned upwards, one-third of the length of the head. Head and body compressed, without ridges. The length of the body (head included) is contained twice and two-thirds in that of the tail; pouch as long as the trunk, lined with soft membrane. Vent opposite to the middle of the dorsal fin. Pectoral fin short and narrow; caudal well developed. Narrow brownish black cross bars, corresponding to the sutures between the body rings.

Freyinet's Harbour.

958. *ICHTHYOCAMPUS MACULATUS*, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 353, pl. 17 fig 2.

Darnley Island (Chevert Exp.)

959. *ICHTHYOCAMPUS ANNULATUS*, Maccl.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 364, pl. 10, fig. 6.

Port Darwin.

Genus *NANNOCAMPUS*, Gunth.

Body with obsolete ridges, the dorsal edges of the trunk and tail being continuous. Pectoral fin none; caudal rudimentary; dorsal short, opposite to the vent. Male with the egg-pouch on the tail, formed by the dilated lower edges.

Australia.

960. *NANNOCAMPUS SUBOSSEUS*, Gunth.

Gunth., Cat. Fishes VIII., p. 178.

D. about 10. Osseous rings 16 + 35.

Head and snout extremely short, the length of the former being contained twice and two-thirds in its distance from the vent. Snout not longer than deep, about two-sevenths of the length of the head. The bones on the *lower* side of the head very well ossified, this side being as broad and convex as the upper. The entire head finely granulated, without ridges. Body ridges obsolete; body slightly compressed. The length of the body (head included) is one-half of that of the tail; pouch as long as the trunk, formed by the dilated lower caudal edges. Vent opposite to the fore part of the dorsal fin. Caudal fin very small. Brown, finely marbled with darker and lighter; body and tail with some narrow, irregular, bluish cross-bands.

Freycinet's Harbour (Herald).

Genus *UROCAMPUS*, Gunth.

Body elongate, compressed, with distinct longitudinal ridges; the upper edge of the trunk continuous with that of the tail; lateral line continuous with lower caudal edge. Tail elongate, quadrangular, tapering. Pectoral and caudal fins developed;

the dorsal is placed entirely on the tail, at a great distance behind the vent.

Manchuria. Australia.

961. *UROCAMBUS CARINIROSTRIS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 200.

“Snout rather turned upwards, very short, being contained once and a half in the diameter of the eye, and nearly three times in the length of the head; it is not abruptly separated from the forehead, and goes slanting to its extremity; the supraorbital ridges are very strong, and sometimes converge in front to form the median ridge of the snout; in other specimens there is between them a rounded, sharp, ridge; there is a short spine at the anterior angle of the eye; the eyes are very prominent; occiput and nuchal shields with ridges; operculum covered with strong radiated striæ, and almost carinated; the pectorals are not much longer than the orbit, and not quite one-half of one of the body shields; the snout is contained about seven times in the trunk; the distance from the anus to the beginning of the dorsal is about equal to one-half its distance to the end of the snout; the body has three ridges, the upper one much more marked than the others; the central one ending at the base of the tail; each shield has two small longitudinal ridges, and is perpendicularly striated; the osseous rings number nine on the body, seven more on the tail before the dorsal, which begins on the seventeenth and extends over the three following; behind these are forty-five or forty-six others; the caudal is very minute; no anal; the tail is tapering and very thin, its ridges much less marked than those of the body. The general colour is a light green, with dark spots corresponding to the centre of the body rings; eye of a golden hue; an indistinct black stripe on the side of the mouth.” (Castelnau).

Port Phillip. Length three to three and a half inches, (taken with shrimps).

## Genus LEPTOICHTHYS, Kaup.

Body with the ridges well developed. Pectoral and caudal fins present; the latter elongate. Dorsal fin of moderate length, opposite to the vent. Humeral bones firmly united. The egg receptacle on the abdomen.

Australia.

I have never seen Kaup's characters of this genus, and Dr. Gunther makes no mention of it except to say that the caudal fin is very long. The characters I have given above are however sufficient to indicate the genus.

## 962. LEPTOICHTHYS FISTULARIUS, Kaup.

Gunth., Cat. Fishes VIII., p. 187.

Snout very long, thin, and much compressed, extended in the same plane as the finely shagreened head. Body unusually elongated, hexagonal, with flat back and belly without intermediate scæles. All the fins are much developed, especially the caudal. The gill-opening is a longer slit than usual. Head oval, occipital shield small, and a furrow commencing at the orbit accompanies the rostral crest. Up to the anus there are twenty-seven body rings, twenty-four of them before the dorsal fin, which stands on nine rings, three of them belonging to the body. The tail is four-cornered, higher than it is broad, and composed of twenty-four long rings. Colour yellowish-brown, with a black cross-band on each ring, ventral piece of the pectoral ring and the gill-cover silvery. Entire length twenty-two inches. Snout 1·97 inch, head and snout 2·76 inches, dorsal fin 1·97 inch, tail 9·46 inches, middle ray of caudal fin (not entire) ·091 inch. (Kaup.)

King George's Sound.

## 963. LEPTOICHTHYS CASTELNAUI.

*Leptoichthys fistularius*, Casteln. Proc. Zool Soc. Vict., Vol. II., p. 77.

“Head five times in the total length; snout up to the nostril contained seven times and one-third in the same, it is long, compressed, and united to the head by a gradual profile; the mouth opens superiorly; the orbit is contained seven times in the length of the head, and the space between the nostril and the anterior edge of the eye is equal to half the diameter of the orbit. The upper part of the head is covered with very minute scales, which have on the operculum a radiated disposition. The pectorals are large and formed of twenty-three rays, the body pentagonal and flat on its upper and lower surfaces; the anus is below the twenty-sixth ring; the dorsal fin begins on the middle of the twenty-fourth ring, and extends over the eight following; it is high and composed of thirty-four rays; the tail is formed of twenty rings, in form similar to the body, the last rings longer, the caudal is as long as the snout, rhomboidal, of ten rays, the four central ones prolonged into filaments. The upper surface of the body is granulated. Colour olive, with the lower parts yellow, caudal fin black.”

South Australia.

The foregoing is Count Castelnau's description almost verbatim, and I judge from a comparison between his description and that given of Kaup's Fish, that they are distinct species. I therefore change the name of this species to *Castelnaui*.

964. LEPTOICHTHYS CRISTATUS, *n. sp.*

D. 24. Osseous rings 18 + 27.

Body compressed, twice as high as wide, with seven well marked ridges: two dorsal, one on each side, and three ventral. The head is compressed in front of the eye into a very sharp high ridge, the mouth opens upwards and is almost vertical, beneath there is a prominent ridge. The eye is large and nearly in the middle of the head, the operculum is covered with radiating striæ, the tail is longer than the head and trunk united and is perfectly quadrangular, the lower ridges are continuous

with those of the body, but the upper pass those of the body by one ring in a different plane. The dorsal fin stands upon five body and two tail rings; the pectorals are broad but short; the caudal is elongate and pointed, as long as the last five tail rings. Colour (in spirits) uniform dark reddish brown. Length four and a half inches.

West Australia. (Macl. Mus.)

Genus *STIGMATOPHORA*, Kaup.

Body depressed, with the ridges obsolete, those of the trunk being continuous with those of the tail; shields covered with soft skin. Pectoral fin developed, caudal absent, the tail tapering to a very fine point. Dorsal fin very long. Males with a caudal pouch formed by cutaneous folds.

Australia.

965. *STIGMATOPHORA ARGUS*, Richards.

Trans. Zool. Soc. III., p. 183, pl. 7, fig. 2.—Gunth., Cat. Fishes, VIII., p. 189.

D. 49-52. Osseous rings 20 + about 75.

Snout very long, about twice as long as the remaining part of the head. Operculum with a slight ridge in young examples, nearly entirely disappearing in old. Vent below the middle of the dorsal fin. Tail more than twice as long as the trunk; egg-pouch shorter than the trunk. Upper parts with numerous small, black, white-edged ocelli, sometimes irregularly arranged, sometimes forming longitudinal or transverse series.

Tasmania. Port Jackson.

966. *STIGMATOPHORA NIGRA*, Kaup.

Gunth., Cat. Fishes, VIII., p. 190.

D. 39-40. Osseous rings 17 + about 72.

Body very depressed. Snout very long, nearly twice as long as the remaining part of the head. Operculum with a distinct longitudinal ridge. Vent below the posterior third of the dorsal fin. Tail more than twice as long as the trunk; egg-pouch extending over fourteen rings. Upper parts uniform brownish (in spirits); abdomen with a brown cross-bar on each suture between the rings.

Port Jackson. Port Phillip.

Count Castelnau makes mention of a species which he names *S. boops*, in his list of Melbourne Fishes (Proc. Zool. Soc., Vict., Vol. I.) but he gave no description of it, and was uncertain if it really differed specifically from *S. nigra*.

967. STIGMATOPHORA OLIVACEA, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 77.

D. about 45. Osseous rings 19 + 84.

Snout rather more than twice the length of the remaining part of the head; the length of the head is a little less than six times in the total length; the opening of the mouth is upwards; a longitudinal ridge runs all along the upper surface of the snout; operculum without any ridge; vent below the middle of the dorsal fin; egg-pouch extending over thirteen rings. The pectoral fins rather large, of eighteen rays. Colour light olive, becoming grey below; egg-pouch orange; all the rings present an obscure tinge at their junction, and these very inconspicuous transverse bands extend on to the snout.

South Australia. Length nine inches.

968. STIGMATOPHORA UNICOLOR, Casteln.

Researches on the Fishes of Australia, p. 49.

Snout once and a half as long as the remaining portion of the head; operculum with a strong, distinct, longitudinal, rather oblique ridge; head ended by a broad trifid spine in the centre,



and a sharp spine on each side; vent below the anterior fourth of the dorsal fin; tail as long as the space from the vent to the posterior third of the snout; body rings seventeen. Colour entirely of a dirty yellow without spots; the upper parts rather brown.

Port Walcott (West Australia). Length six inches.

969. STIGMATOPHORA DEPRESSIUSCULA, *n. sp.*

D. 49. Osseous rings 19 + about 66.

Body depressed. Snout very long and slender, more than twice the length of the rest of the head; a prominent tubercle on each side of the snout in front of the eyes; operculum striated, but scarcely ridged; the vent under the anterior third of the dorsal fin; the egg-pouch slightly longer than the trunk; tail more than twice the length of the trunk; ventral surface very flat; body ridges laterally dilated, but not so much as in *S. nigra*. Colour (in spirits) reddish-brown, faintly marbled with darker brown; two longitudinal lines of small dark brown or black spots along the back between the two faint dorsal ridges. Length seven inches.

King George's Sound.

970. STIGMATOPHORA GRACILIS, *n. sp.*

D. 58. Osseous rings 20 + 56.

Elongate, slender, scarcely depressed. Snout twice the length of the rest of the head, considerably dilated and turned up at the point, vent under the middle of the dorsal fin; tail double the length of the trunk. Colour (in spirits) pale reddish or yellowish brown, with brown cross-bars on the sutures of the body rings, most distinct on the back, a broad brown band between and on the eyes.

Tasmania. Length five inches.



Second Group *Hippocampina*.

Tail prehensile, without a caudal fin.

Genus *GASTROTOKEUS*, Kaup.

Body depressed, the lateral line running along the margin of the abdomen. Shields smooth. Tail shorter than the body, prehensile. Pectoral fins. The males carry the eggs embedded in soft membrane on the abdomen, without a pouch being formed by a lateral expansion of the integuments.

Indian and Australian Seas.

971. *GASTROTOKEUS BIACULEATUS*, Bl.

Gunth., Cat. Fishes VIII., p. 194.

D. 40-45. P. 17-23. Osseous rings 18 + 45-55.

Superciliary margin terminating behind in a more or less distinct spine. Old individuals sometimes with minute filaments on the lower side of head, body and tail. Origin of the dorsal fin nearly opposite to vent.

Cape York, Port Essington, South Coast New Guinea.

Genus *SOLENOGNATHUS*, Kaup.

Body compressed, deeper than broad, only in adult females somewhat dilated. Shields hard, rugose, with round or oval interannular plates; no elongate processes. Tail shorter than the body, prehensile. Pectoral fins.

Chinese and Australian Seas.

972. *SOLENOGNATHUS HARDWICKII*, Gray.

Gunth., Cat. Fishes VIII., p. 195.

D. 43-45. Osseous rings 26-27 + 55-60.

Dorsal surface slightly concave or flat. Shields very rough and rugose, but with scarcely any spines; operculum with

radiating granulated lines; a cluster of prominent tubercles on the hinder part of the superciliary edge.

Houtman's Abrolhos.

973. SOLENOGNATHUS SPINOSSIMUS, Gunth.

Gunth., Cat. Fishes VIII., p. 195.

D. 35. Osseous rings 27 + 55.

Dorsal surface slightly convex. All parts covered with small but very distinct spines; the radiating lines of the operculum spiny. Orbital edge denticulated, but without prominent tubercles above.

Tasmania.

Genus PHYLLOPTERYX, Kaup.

Body compressed or as broad as deep. Shields smooth, but some or all of them are provided with prominent spines or processes on the edges of the body; some of the processes with cutaneous filaments. A pair of spines on the upper side of the snout and above the orbit. Tail about as long as the body, prehensile. Pectoral fins. The eggs are carried embedded in soft membrane on the lower side of the tail.

Australia.

974. PHYLLOPTERYX FOLIATUS, Shaw.

Gunth., Proc. Zool. Soc., 1865, pl. 14, and Cat. Fish. VIII., p. 196.

D. 30. Osseous rings 18 + 35.

Trunk much elevated, especially in females, in which its depth sometimes equals the length of the snout. A pair of small spines on the upper part of the snout, much nearer to the eye than to its extremity; a pair of superciliary spines. A long occipital and nuchal process, which as well as the other processes on the body, bear cutaneous appendages. Pairs of long divergent processes along the back of the twelfth body-ring, and on the first, tenth,

sixteenth, twenty-fourth and twenty-seventh tail-rings. A similar pair of ventral processes on the ninth body-ring. Scarlet or orange-coloured, with numerous small, round, yellow spots. Each of the nine anterior body-rings with a violet band on the lower half; two or three similar bands before the vent.

Port Jackson, South Australia, Tasmania.

975. *PHYLLOPTERYX EQUES*, Gunth.

Proc. Zool. Soc., 1865, p. 327, pl. 15, and Cat. Fishes VIII., p. 197.

D. 37. Osseous rings 19 + 36.

The snout is as long as the distance of the front margin of the orbit from the hind part of the nape; it bears a pair of small spines behind the middle of its upper edge, a pair of minute barbels at the chin, and a pair of long appendages in the middle of its lower part. The forehead bears an erect, broad, sub-quadrangular crest, with a shorter single spine behind; a horizontal spine above each orbit; a cluster of spines with narrow appendages on the occiput. Nape of the neck with a long spine, dilated at the base into a crest, and carrying a long bifid appendage. The trunk is compressed, somewhat dilated, strongly arched on the back, and with two deep indentations in its lower profile. The spines are of three kinds: 1. The band bearing spines are the strongest, strongly compressed, not flexible, each terminating in a pair of short points. There are one pair of these spines in the middle of the back, and one on each of the three prominences of the abdominal outline; the flaps are long and bifid. 2. Very long, compressed and somewhat flexible spines without appendages; these occupy in pairs the uppermost part of the back, and in a single series the median line of the belly. 3. Small short conical spines run in series along the lateral edges of the belly; a pair of similar spines in front of the lower part of the base of the pectoral fin. Tail quadrangular, with sharp edges, and with five pairs of band-bearing spines

along its upper side. Dorsal fin situated entirely on the tail. (Gunther).

Port Lincoln.

976. *PHYLLOPTERYX ELONGATUS*, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 76.

Like *P. foliatus* but much smaller, the spine on each side of the snout lateral, not superior; body more elongate, its greatest height in the female being only half the length of the snout; the foliated appendages of the processes are much shorter, broader, and of an oval form. The colour is lighter; the muzzle, lower parts of the head and body and the sides of the tail are white; the upper parts of the snout, head, and body are of a lilac colour, covered with numerous round white spots. The foliated appendages and the end of the tail are black.

South Australia.

977. *PHYLLOPTERYX TENIOPHORUS*, Gray.

Proc. Zool. Soc., 1859, p. 38, pl. 7.—Gunth., Cat. Fishes, VIII., p. 197.

D. 25. Osseous rings 21 + 45.

Body as broad as deep, as long as the tail. Each shield with a prominent spine on each edge, except on the lower side of the prehensile portion of the tail. Snout with a pair of spines above, in the middle of its length. A pair of supra and infra-orbital spines; several spines on the median line of the crown and nape. Many of the spines are band-bearing, but these do not differ in form or size from the others. The vent is below the middle of the dorsal fin. Brown irregular dark-brown bands across the back.

Freycinet's Harbour. (Herald.)

## Genus HIPPOCAMPUS, Leach.

Trunk compressed, more or less elevated, composed of from ten to twelve rings. Shields with more or less prominent tubercles or spines. Occiput compressed into a crest, terminating at its supero-posterior corner in a prominent knob (coronet). Supra-orbital, temporal and humeral regions with prominences. Tail prehensile, finless. Pectoral fins. Eggs carried in a sac at the base of the tail, opening near the vent.

All Temperate and Tropical Seas.

## 978. HIPPOCAMPUS ABDOMINALIS, Kaup.

Gunth., Cat. Fishes, VIII., p. 199.

Dorsal fin 28-31. Tubercles not much developed and very obtuse; those on the head sometimes with simple filaments. Length of the snout rather more than, or equal to, the distance between the posterior margin of the orbit and the gill-opening in adult examples, but shorter in young ones. Body generally with large round brown spots, more or less confluent into bands on the hinder part of the tail; head with much smaller round brown spots, of which those round the orbit are the most constant. Sometimes uniform blackish brown.

Tasmania.

## 979. HIPPOCAMPUS ANTIQUORUM, Leach.

Gunth., Cat. Fishes, VIII., p. 200.

Dorsal fin 19. Tubercles generally well developed on the head and body, and sub-acute, rarely blunt. Length of the snout equal to the distance between the hind margin of the orbit and gill-opening. Spines on the head and neck sometimes with simple filaments. Brown with bluish-white dots, more or less confluent into lines on the lower part of the side and gill-cover; dorsal fin with a black sub-marginal band.

Cape York. (Damel.)

980. *HIPPOCAMPUS BREVICEPS*, Peters.

Gunth., Cat. Fishes, VIII., p. 200.

Dorsal fin 19-21, standing on five rings, two of which belong to the tail. Some of the tubercles are prominent but obtuse. Snout very short, scarcely as long as the operculum. Supra-orbital process well developed, subvertical, triangular. Coronet as high as the orbit, with ridges, but without spines at the top. Eleven body-rings. Hind part of the trunk considerably dilated. Head and body with numerous very small white dark-edged ocelli; operculum with brown dots besides; tail with narrow irregular yellowish rings.

Tasmania, South Australia, Port Phillip.

981. *HIPPOCAMPUS ANGUSTUS*, Gunth.

Gunth., Cat. Fishes, VIII., p. 200.

Dorsal fin 19-20, standing on two body and two tail-rings. Eleven body-rings. Body but little dilated in males, in which its greatest depth is about half the length of the head; females still narrower. Tubercles prominent, acute, without tentacles. Supra-orbital spine erect, simple, pointed; lower breast spines double on each side. Coronet rather low, connected by a narrow, concave, bony bridge with the occipital knob. The length of the snout equals the distance between the anterior margin of orbit and the gill-opening. Snout, head, body, and dorsal fin finely reticulated with brown; some specimens covered with minute white dots besides.

Freycinet's Harbour. (Herald.)

982. *HIPPOCAMPUS NOVÆ-HOLLANDIÆ*, Steind.

Gunth., Cat. Fishes, VIII., p. 201.

Dorsal fin 17. Body rings 11. Tubercles prominent, acute, without tentacles. Supra-orbital spine simple, slender. Coronet elevated, that part of it which connects with the occipital knob,

is long, strong, with the anterior profile not concave. The length of the snout is equal to the distance of the anterior margin of the eye from the gill-opening. Snout, head, and body finely marbled and reticulated with brown.

Port Jackson, Port Phillip.

983. *HIPPOCAMPUS TRISTIS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 197.

Dorsal fin 14. Like the preceding species, but the tail shorter; the shields of the body covered with transverse stripes; the anterior abdominal crest of the body divided into points generally bifid. Dorsal fin with a narrow longitudinal band and the rays marbled. No filaments. (Castlenau.)

Port Phillip.

984. *HIPPOCAMPUS ELONGATUS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 144.

Dorsal fin with eighteen rays, standing on three body-rings. Body elongate, the broadest ring of the body not being one-fifth wider than the first two; tubercles moderately acute; no tentacles; snout as long as half the head; a short thin ridge in front of the eyes; supra-orbital spine conical, rather long, sharp, and pointed; a single conical and rather notched spine in front of the coronet; this with its terminal five points well marked; eleven body-rings; the part supporting the dorsal fin very little higher than the back. Colour (in a dried state) light greyish yellow, covered with obscure brown irregular marbled spots.

West Australia. Length three inches.

985. *HIPPOCAMPUS SUBELONGATUS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 145.

Dorsal fin with eighteen rays, standing on three body-rings; body rather elongate, the broadest part not being more than

one third wider than the narrowest; snout up to the anterior edge of the eye longer than the other part of the head; tubercles moderately acute; a short thin rather rounded ridge in front of the eyes; supra-orbital spine broad, arched, and rather notched; a single short, blunt, and notched spine in front of the coronet; this rather elevated, directed very obliquely and terminated by five well marked but blunt spines; eleven body-rings. Colour (dried) yellow, with transverse narrow brown bands on the snout.

West Australia. Length four and a half inches.

986. HIPPOCAMPUS TUBERCULATUS, Casteln.

Researches on the Fishes of Australia, p. 48.

All the tubercles, particularly those of the tail, very much developed, the latter ones much thicker at their extremity than at their base. Snout short, being only once and a half the diameter of the eye and considerably shorter than the operculum; hind part of the trunk considerably dilated; the supra-orbital tubercles are long, thick, and bear a short tentacle; all the other tubercles without tentacles; coronet thick, quadrilateral at its extremity; eleven body-rings; thirty-two or thirty-three caudal rings, the last two or three united. Colour dark brown.

Swan River. Length two and a half inches.

ORDER VI. PLECTOGNATHI.

*Teleosteous Fishes with rough scales or with ossifications of the cutis in the form of scutes or spines; skin sometimes entirely naked. Skeleton incompletely ossified, with the vertebræ in small number. Gills pectinate; a narrow gill-opening in front of the pectoral fins. Mouth narrow; the bones of the upper jaw generally firmly united. A soft dorsal fin, belonging to the caudal portion of the vertebral column, opposite to the anal; sometimes elements of a spinous dorsal besides. Ventral fins none or reduced to spines. Air-bladder without pneumatic duct.*



## FAMILY I. SCLERODERMI.

Snout somewhat produced; jaws armed with distinct teeth in small number. Skin with scutes or rough. The elements of a spinous dorsal and ventral fins generally present.

## Genus TRIACANTHUS, Cuv.

Body compressed, covered with very small or minute rough scales. Tail narrow, prolonged. Teeth in a double series in each jaw, those of the outer series incisor-like, ten in number, those of the inner more rounded, two or four in number. Anterior dorsal fin with three or five small spines behind a very large one. Ventral fin formed by a pair of strong spines joined to the pelvic bone. Vert. 9/10.

Indian and Australian Seas.

## 987. TRIACANTHUS BIACULEATUS, Bl.

Gunth., Cat. Fishes, VIII., p. 210.—Bleek. Atl. Ichth. Balist., pl. 8, fig. 3.

D. 5/22-25. A. 16-19.

The height of the body is contained from twice and a half to thrice and one-fifth in the total length without caudal fin. Snout produced, with the upper profile distinctly concave. The first dorsal spine as long as the head, and sometimes considerably longer; the second very short not much longer than the third, the fin with or without black spot.

Port Essington, Cape York.

## Genus BALISTES, Cuv.

Body compressed, covered with juxtaposed, moveable scutes; some species with series of spines or tubercles on the side of the tail. Upper jaw with a double series of incisor-like teeth, eight in the outer and six in the inner series; lower jaw with eight similar teeth in a single series. The first dorsal fin reduced

to three spines, the anterior of which is by far the strongest. Ventral fins reduced to a simple osseous appendage. No barbel. Vertebrae 7/10. Branchiostegals six.

Tropical Seas.

988. *BALISTES STELLATUS*, Lacep.

Gunth., Cat. Fishes VIII., p. 212.—Bleek., Atl. Ichth. Balist. pl. 1.

D. 3/27. A. 25. L. lat. 44.

Tail depressed behind, with two obtuse ridges on each side. Twenty-four scales in a transverse series running from the origin of the soft dorsal to the vent. A patch of enlarged scales behind the gill-opening. Dorsal and anal fins not elevated; caudal with the posterior margin undulated, and the lobes produced into long filaments in adult specimens. Ventral spine moveable. Adults with but few markings—a whitish band along the middle of the trunk, and dark longitudinal stripes on the dorsal and anal fins. In young examples there are four large white spots on the back—the first between the eye and dorsal spine, the second between the dorsal fins, and the last on the tail. The body besides is ornamented with more or less irregular bluish spots. In very young examples the white dorsal spots are very distinct, the ground colour of the back being a deep brown.

West Australia (*B. phaleratus*). N. E. Australia.

989. *BALISTES ACULEATUS*, L.

Gunth., Cat. Fishes VIII., p. 223.—Bleek., Atl. Ichth. Balist., p. 2, fig. 3.

*Monacanthus Cheverti*, All. & Macl., Proc. Linn. Soc. N.S. Wales, Vol. I., p. 355, pl. 17, fig. 3.

Torres Straits.

990. *BALISTES UNDULATUS*, Mungo Park.

Trans. Linn. Soc. III., p. 37.—Gunth., Cat. Fishes VIII., p. 226.

D. 3/27. A. 24. L. lat. 41.

Tail with six (? four) strong spines on each side, arranged in a double series. Twenty-four scales in a transverse series, running from the origin of the dorsal fin to the vent. Some small osseous scales behind the gill-opening. Dorsal and anal fins rather low, with rounded profile; caudal sub-truncate. Blackish-brown; head and body with numerous oblique and somewhat undulated yellowish or reddish stripes; two, broader than the others, proceed from the lips, and are confluent posteriorly. The first dorsal fin black, the others orange coloured. The spines on each side of the tail in a black patch.

Cape York (Castelnau).

991. BALISTES GARNOTI, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 107.

D. 3/22. A. 19.

Form short and high, the height of the body being half the total length; the length of the head is twice and eight-tenths in the same, and the diameter of the eye is three times in the length of the head. The profile of the head is straight, very little concave, the first dorsal spine is strong and straight, rough with small spines; the second dorsal fin is high and triangular; anal similar. Colour light yellowish-brown, darker on the back, with faint traces of annulated spots; the second dorsal fin is also faintly spotted. There are one or two irregular blotches at the base of the anal fin. On each side of the body there is a faint brown line, which is divided about the middle into two, one running to the posterior edge of the dorsal fin, the other to the anal. Fins yellow.

Knob Island (Torres Straits).

Genus *MONACANTHUS*, Cuv.

Body compressed, covered with very small or minute rough scales; adult males of some of the species with a peculiar

armature on the side of the tail, which in females is much less developed or entirely absent. Upper jaw with a double series of incisor-like teeth, six in the outer, and four in the inner series; lower jaw with six similar teeth in a single series. The first dorsal fin reduced to a single strong spine, behind which generally another rudimentary spine. Ventral fins reduced to a simple osseous fixed or moveable small appendage, which is sometimes rudimentary or entirely absent. No barbel. Vertebrae 7/11-14.

Tropical and Sub-tropical Seas.

1. *Anal fin with less than forty rays.*

A. Dorsal spine with four series of barbs.

992. *MONACANTHUS HIPPOCREPIS*, Quoy & Gaim.

Gunth., Cat Fishes, VIII., p. 246.—Casteln. Proc. Linn. Soc., N. S. Wales, Vol. III., p. 399.

*Aleuterius variabilis*, Richards. Voy. Erebus and Terror, p. 67, pl. 53, fig. 1.

Described in Proc. Linn. Soc., N.S. Wales, loc. cit.

Port Jackson, South Australia.

993. *MONACANTHUS GUNNII*, Gunth.

Gunth., Cat. Fishes VIII., p. 247.

D. 34. A. 33.

Skin velvety, without distinct scales. Body somewhat elevated, its depth being a little more than half the total length without caudal fin. Snout rather produced, with the upper profile very slightly concave. Gill-opening much advanced, its greater portion being in front of the eye; pectoral fin below the middle of the orbit. Dorsal spine strong, above the middle of the orbit, with a double row of barbs in front and behind, the

anterior rows being much closer together than the posterior. Caudal fin rounded; dorsal and anal fins low. Ventral spine small, fixed, with spikes pointing forwards and backwards. Dark brown, mottled with black.

Tasmania. Length eleven inches.

994. *MONACANTHUS CONVEXIROSTRIS*, Gunth.

Gunth., Cat. Fishes VIII., p. 248.

D. 34-37. A. 32-35.

Body covered with small spiny but very distinct scales, without cutaneous filaments. Body rather oblong, its depth being about two-fifths of the length without the caudal fin. Snout rather produced, *with the upper profile convex*. Gill-opening much advanced, partly in front of the vertical from the anterior margin of the eye; pectoral fin below the middle of the orbit. Dorsal spine situated above the hinder half of the eye, rather strong, but much shorter than the head, armed in front with a double series of barbs, which are closely set and smaller than those behind. Caudal fin rounded, shorter than the head; dorsal and anal fins low. Ventral spine small, fixed, prominent, with barbs. Coloration uniform greyish, or clouded with darker. Length nine inches.

Tasmania, Port Jackson. (Castelnau.)

995. *MONACANTHUS MULTIRADIATUS*, Gunth.

Gunth., Cat. Fishes VIII., p. 248.

D. 38. A. 36.

Body covered with minute rough scales, with short bristles on the side of the tail, which in adult examples is armed with three pairs of strong spines pointing forwards. Body oblong, its depth being contained twice and three-fourths in the length exclusive of the caudal fin. Snout produced, with the upper profile convex. Gill-opening situated below the hind margin

of the orbit, the pectoral fin being entirely behind the vertical from the eye. Dorsal spine compressed in the direction of the longitudinal axis of the body, armed laterally with a row of barbs, and in front with a double series of small very closely set barbs; it is smooth behind, rather feeble, and situated above the hinder part of the orbit. Caudal fin truncate; dorsal and anal fins low. Ventral spine very small, rough, free from the abdominal flap. Coloration uniform brownish grey; the base of the caudal spines of the hind margin of the caudal fin light-coloured.

South Australia. Length eighteen inches.

996. *MONACANTHUS TRACHYLEPIS*, Gunth.

Gunth., Cat. Fishes VIII., p. 248.

D. 39. A. 35.

Scales not distinct, replaced by short vertical prominences, each of which bears from three to five spinelets. Tail with two pairs of strong compressed spines bent forwards. Body oblong, its depth being contained twice and two-thirds in the length without the caudal fin. Snout produced, with the upper profile straight. Gill-opening below the hinder half of the orbit; pectoral fin behind the vertical from the hind margin of the orbit. Dorsal spine strong, very long, nearly as long as the head, situated above the posterior half of the orbit; it is armed behind with a double series of very small barbs, and there is also a double series of minute barbs in the median line of the anterior surface of the spine. Caudal fin rounded, short; dorsal and anal fins low. Ventral spines very small, fixed, with very short spikes radiating from its centre. Colour blackish-brown; the dorsal and anal fins yellow, the tail orange; blue spots along the base of the dorsal, anal, and caudal fins.

Broken Bay. Length fourteen inches.

997. *MONACANTHUS PERONII*, Hollard.

Ann. des Sc. Nat. 1854, Vol. II., p. 356, pl. 13, fig. 4.

D. 35. A. 34. P. 12.

Rather elongate, profile straight or with an almost imperceptible concavity; back slightly concave between the two dorsal fins; the dorsal spine is short, straight with short spines on all the angles; the ventral spine is prominent, covered with spinules, and is immediately in front of a marked abdominal concavity. The scales are spine-like with swollen tips. The colour is a pale brown, with darker brown spots on the body, disposed in rather irregular series; two or more narrow brown bars across the caudal fin.

Australia (Hollard).

The Fish described by Dr. Gunther (Cat. VIII., p. 240) as *M. Peronii*, Hollard, cannot be that species. I believe that Count Castelnau has also made a similar mistake in the Proceedings of the Linnean Society of N. S. Wales, Vol. III., 398, and given this name to a species distinct not only from Hollard's but also from Dr. Gunther's.

998. *MONACANTHUS GUNTHERI*,

*Monacanthus Peronii*, Gunth., Cat. Fishes VIII., p. 249.

D. 33-35. A. 33.

Body covered with papillæ, each with a round expansion at the top, like a mushroom; in examples exposed to the air for some time they shrink, assuming the appearance of a spine. Adult males with a band of long stiff slender spines on each side of the tail between the dorsal and anal fins, like a tooth-brush. Body oblong, its depth being contained twice and one-third in the total length (without caudal fin). Snout produced with the upper profile very slightly concave; base of the pectoral fin below the hinder part of the eye. Dorsal spine straight, four-edged, each edge with a series of barbs, the anterior barbs being stronger

than the posterior; the spine is inserted above the middle of the orbit, and is not more than one-half of the length of the head. Caudal fin rounded; dorsal and anal fins low. Ventral spine very short, fixed. Brown, with small darker brown spots. Length ten inches.

Tasmania, Port Phillip, Port Jackson.

999. *MONACANTHUS BROWNII*, Richards.

Voy. Erebus and Terror, p. 68.—Gunth. Cat. Fishes, VIII., p. 249.

D. 32-33. A. 30-31.

Skin minutely granular. Adult specimens with the sides of the tail covered with short, fine, setiform bristles, and with two pairs of strong straight conical spines. Body oblong, its depth being one-third of the length, exclusive of caudal fin. Snout produced, with the upper profile convex. Dorsal spine of moderate strength, straight, much shorter than the snout; four-edged, each edge with a series of barbs. Caudal fin rounded; dorsal and anal fins low. Ventral spine none; abdominal edge trenchant. Green with blue dots over the whole body; the spots are replaced by blue oblique and longitudinal lines on the side of the head and anterior part of the trunk. The part of the tail which is armed with bristles and spines is of an orange colour. Fins green. Length twelve inches.

Coasts of Australia.

1000. *MONACANTHUS SPILOMELANURUS*, Quoy & Gaim.

Gunth., Cat. Fishes VIII., p. 250.

*M. paragaudatus*, Richards., Voy. Erebus and Terror, p. 66, pl. 39, figs. 1-4.

D. 30-32. A. 28-32.

Skin minutely granular. Adult males with a tooth-brush-like cluster of setiform spines on the side of the tail between the



dorsal and anal fins. Body oblong, its depth being about one-third of the length with caudal fin. Snout long, pointed, the upper profile being much more oblique than the lower. Dorsal spine of moderate strength, rather short, straight, four-edged, each edge with a series of barbs; the spine is inserted above the hinder part of the orbit. Caudal fin rounded; dorsal and anal fins of moderate height. Ventral spine very small, in young examples absent. Brownish, with brown and light dots about the head and body; side of the body with dark undulated lines. Young examples with a narrow light line edged with black above and below, from the snout through the lower part of the eye along the middle of the side; a brown line runs from one eye round the forehead to the other. Caudal fin with a vertical intramarginal black band, which disappears in old examples.

Tasmania, South Australia, Port Jackson. Length eight inches.

1001. *MONACANTHUS MACULOSUS*, Richards.

Voy. Erebus and Terror, p. 67, pl. 39, figs. 5-7.—Hollard, Ann. Sc. Nat. 1854, II., p. 359, pl. 14, fig. 1.

D. 29-33. A. 29-30. P. 12.

Of rather elongate form, the height of the body being one-third of the total length. Snout long, very slightly concave above. Dorsal spine rather longer than in *M. spilomelanurus* with four rows of barbs, it is placed behind the orbit. The ventral spine is very small and very feebly armed; caudal fin long, rather pointed. Colour brownish with a number of small darker spots; the caudal fin with a brown cross-bar at its base, and sometimes near the extremity also. Length five inches.

Tasmania, Port Jackson.

1002. *MONACANTHUS CASTELNAUI*.

*M. Peronii*, Casteln. Proc. Linn. Soc. N.S. Wales, Vol. III., p. 398.

Port Jackson.

1003. *MONACANTHUS FREYCINETI*, Hollard.

Ann. des Sc. Nat. 1854, Vol. II., p. 336, pl. 12, fig. 3.

D. 36. A. 35. P. 13.

The profile of the head and snout is almost straight, and at an angle of  $40^{\circ}$ , or more; the muzzle is very obtuse and the back between the fins horizontal. The dorsal spine is very long, with four rows of barbs and is a little flattened, the second ray or spine attached to the first by a membrane, is much larger than usual, and resembles a *Balistes*. The soft dorsal and anal fins are considerably lower posteriorly than in front. The ventral spine terminates in a prominent spinous plate, the abdominal outline behind it extending some distance before the commencement of the anal fin. On each side of the tail there are six or seven strong spines placed in two rows, and pointing backwards. The colour is uniform and of a darkish hue, in most preserved specimens, but one shows traces of lines or streaks on the body, the spines on the tail are generally black on the point, and the portion of the tail on which they are situated is of a lightish hue.

New South Wales.

1004. *MONACANTHUS PLATIFRONS*, Hollard.

Ann. des Sc. Nat. 1854, Vol. II., p. 341.

D. 33.? A. 31.? P. 12.

Form thick and rather elongate, the profile of the head a little convex, at an angle of  $30^{\circ}$ ; the forehead is very broad and flat between the eyes, and the muzzle is rounded. The dorsal spine is straight and rather short, with four rows of barbs; it is placed above the hinder half of the eye which is very large. The ventral spine is not prominent and has at its extremity a small spinous plate. The soft dorsal and anal fins are wanting, or much injured, in the only specimen known. The scales of the body each bear from one to four straight slender spinules,

smallest at their extremity. The colour seems to be uniform, and of a blackish-gray.

King George's Sound.

1005. *MONACANTHUS FORSTERI*, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 204.

D. 34. A. 27. P. 13. C. 12. V. none.

The profile in front of the dorsal spine is concave, behind it convex. The body is rather elongate, the height being contained twice and one-third in the total length; the snout from its extremity to the orbit is four times and one-third in the same; the lower profile is more convex than the upper. The dorsal spine is slender, short, and straight, its length is contained once and one-fifth in the transverse diameter of the eye; it is placed over the centre of the eye, and is compressed, quadrangular and armed with short barbs. No ventral spine; caudal fin long; the skin is covered with very minute granulations, which become spinous on the tail. The four large anterior teeth are almost square. Colour dark green on the upper parts of the body, white beneath, with irregular dark spots most numerous on the sides. Fins light green.

Port Phillip. Length three inches.

1006. *MONACANTHUS PRASINUS*, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 205.

D. 35. A. 34. P. 13.

Profile straight. The dorsal spine is inserted over the posterior third of the eye, is arched and armed with four rows of strong spines directed downwards, those in the posterior row largest. The spine is very strong, and its length is twice and a quarter the diameter of the orbit; there is a second spine, which is one-third of the length of the first. The ventral spine is fixed and formed of a small nest of spinelets, three of which, on each

side, are much larger than the others and curved. The height of the body, when the pubic bone is extended, is twice and two-thirds the total length. The two front teeth are triangular, and by their junction form a pointed edge, the other teeth are also pointed. The skin is covered with very fine velvety granulations. The colour is bright green, silvery on the belly; the second dorsal and anal fins transparent, rather darker on the margin.

Port Phillip, Port Jackson. Length two and a half inches.

1007. *MONACANTHUS BAUDINI*, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 55.

D. 35. A. 31. P. 13. C. 8.

Body covered with indistinct scales of a lozenge form, each with three or four spinelets. Snout very long, profile straight. The distance from the snout to the orbit is one-fourth of the total length. Teeth very large, the upper ones conical, and the lower strongly and obliquely emarginate and forming a strong external point. The ventral spine is very small and fixed, its spinelets very small. The dorsal spine is situated over the posterior part of the eye, it is slender and straight and its length is one-sixth of the total length; it has four series of barbs, the anterior two smaller and closer together than the posterior. The caudal fin is rounded, the soft dorsal and anal fins are high. Coloration not mentioned.

Victoria, Tasmania. Length ten inches.

1008. *MONACANTHUS LESUEURII*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 56.

D. 34. A. 33. P. 15.

The body is oblong, with the upper profile of the head very concave. The skin is covered with very minute and smooth scales, those of the head and some parts of the body more granulose. Snout thick, much rounded above, its length to the

orbit is one-fourth of the total length. Teeth moderate, almost square, with the two upper front ones larger and shaped obliquely into a point. Ventral spine of moderate size, rounded, and surrounded by a crown of very short spines; it does not appear moveable. The dorsal spine is thick, straight, as long as the snout, and inserted over the centre of the orbit, which is placed obliquely; there are on it four rows of strong and equi-distant barbs. The caudal fin is rather long, the soft dorsal and anal fin low. Colour dark brown, fins pinkish or of a paler colour.

Western Port. Length four inches.

1009. *MONACANTHUS MARGARITIFER*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 80.

Syn. *M. perulifer*, and *obscurus (olim brunneus)* Castelnau, and *M. Damellii*, Gunth.

D. 30. A. 28.

The entire head and body coarsely granular, each granule terminating in a spine. Tail not armed. The depth of the body is more than half the length (caudal fin excluded). Snout rather produced with the upper profile slightly concave. Gill-opening below the middle, root of the pectoral fin below the posterior half of the eye. Dorsal spine above the middle of the eye, long, as long as the distance from the gill-opening to the snout, armed with four series of barbs, of which the anterior are smaller and closer together than the posterior. Caudal fin rounded; dorsal and anal fins low. Ventral spine short, fixed, with very short spikes. Colour uniform blackish-grey. Length six inches.

West Australia, South Australia, Port Jackson.

1010. *MONACANTHUS VITIGER*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 81.

D. 30. A. 30. P. 13. C. 12.

The height of the body is contained twice and two thirds in the total length; the length of the head about three times in the same; the diameter of the eye is contained once and two-thirds in the length of the snout. Form rather elongate; the body is covered with minute mushroom-shaped granulations. The ventral spine is formed of a little bunch of spinules; the dorsal spine is inserted a little behind the centre of the orbit, and a little in front of the insertion of the pectorals; its height is about equal to half that of the body; it is straight, four-edged, and terminates in a small filament; the anterior barbs are strong, directed downwards; the posterior are more feeble and closer together than the anterior. The caudal fin is rather long. Colour light green, white on the belly, an irregular, broad band extends on each side from the snout to the tail; the first dorsal fin is green, the second and the anal and pectorals are white and transparent. Length under two inches.

South Australia.

1011. *MONACANTHUS YAGOI*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 245.

St. Vincent's Gulf. Length ten and a half inches.

1012. *MONACANTHUS SANTI-JOANNI*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 246.

Hobson's Bay. Length ten to twelve inches.

1013. *MONACANTHUS GUTTULATUS*, MacI.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 37, pl. 4, fig. 2.

King George's Sound.

1014. *MONACANTHUS MELAS*, Gunth.

Ann. and Mag. Nat. Hist., 1876, Vol. XVII., p. 402.

D. 34. A. 34.

Skin velvety, without distinct scales. Shape oblong, the height of the body being a little less than one-third of its length (without caudal), or two-sevenths of the total length. Snout long, the distance of the eye from its end being contained thrice and four-fifths in the length of the body; upper profile very convex. Gill-opening below and partly in advance of the eye. Root of the pectoral fin beneath the hinder part of the orbit. Dorsal spine long and slender, situated above the hinder part of the eye, its length being contained once and a half in the depth of the body and in the length of the head; four rows of very small barbs, the two anterior close together, all being rather indistinct. Caudal fin with the margin rounded. Dorsal and anal fins higher anteriorly than posteriorly. Ventral spine small, fixed. Colour brownish-black, with two whitish bands across the chin. Dorsal spine and caudal fin black; the other fins light-coloured.

Tasmania. Length fourteen inches.

B. Dorsal spine with two series of barbs.

1015. *MONACANTHUS CHINENSIS*, Bl.

Gunth., Cat. Fishes VIII., p. 236.—Bleek. Atl. Ichth. Balist., p. 125, pl. 222, fig. 2.

Syn. *M. geographicus*, Cuv. & Casteln. Res. Fishes of Aust., p. 50.

D. 28. A. 28-29. Vert. 7/11.

Scales exceedingly small and rough, each with a median crest which sometimes terminates in a spine. On each side of the tail six spines directed forwards and disposed in two rows; they are scarcely visible in young specimens or females. Body elevated, its depth being contained from once and a half to once and three-fourths in the length without caudal fin; the upper profile rises from the dorsal spine to the origin of the soft dorsal fin, which is the highest part of the back. Snout pointed, with the upper profile concave. Dorsal spine strong, shorter than the



head, inserted above the posterior half of the eye, and armed behind with a double series of strong recurved spines. Caudal fin rounded, rather shorter than the head; old males with the upper caudal ray slightly produced. Ventral spine moveable, tapering, without spinelets, attached to the cutaneous ventral expansion, which is much developed, extending beyond the spine. Dorsal and anal fins moderately elevated, the sixth or seventh rays being the longest, about half as long as the head. Brownish, irregularly marbled with blackish, and the whole body or part of it with numerous small brown spots. Vertical fins crossed by series of small black dots or lines.

North-west Coast of Australia.

1016. *MONACANTHUS MEGALURUS*, Richards.

Gunth., Cat. Fishes VIII., p. 237.—Casteln. Proc. Linn. Soc. N.S. Wales, Vol. III., p. 398.

*M. Chinensis*, Richards. Voy. Erebus and Terror, p. 64, pl. 40, figs. 3-4.

D. 32. A. 31.

The description of the previous species, *M. chinensis* applies in every particular to the present species excepting that the scales are larger and the dorsal spine more slender. The coloration is given by Count Castelnau in Vol. III., of our Proceedings (*loc. cit.*)

Port Jackson, Freycinet's Harbour.

1017. *MONACANTHUS TOMENTOSUS*, L.

Gunth., Cat. Fishes VIII., p. 238.—Bleek., Atl. Ichth. Balist., p. 127, pl. 220, fig. 1.

D. 27-29. A. 25-27.

Scales exceedingly small, each with four or five spines on the margin; on each side of the tail an oblong patch of short setiform spines, well developed in adult males, but very small or entirely absent in females and young. Body sometimes with scattered,



short filaments. Body elevated, its depth being one-half or two-thirds of the length without the caudal fin. Snout pointed, with the upper profile concave. Dorsal spine very strong, about as long as the head, situated above the eye rather behind the middle, and armed behind with a double series of strong recurved spines. Caudal fin rounded; dorsal and anal fins low. Ventral spine moveable; armed with curved spinelets on the side, separated from the ventral rays. Brown, marbled with blackish; an indistinct whitish longitudinal band on the side of the trunk, behind the gill-opening. Caudal fin with two blackish cross-bands.

Australia (Gunther), Endeavour River (young, Macl. Mus.)

1018. *MONACANTHUS SULCATUS*, Hollard.

Ann. Sc. Nat. 1854, II., p. 363, pl. 14, f. 3.—Gunth., Cat. Fishes VIII., p. 239.

D. 29-32. A 31-33.

Scales minute, spiny, each with a keel, the keels confluent, forming parallel longitudinal raised lines. Body rather elevated, its depth being a little more than one-half the length without caudal fin. The dorsal profile between the dorsal fins somewhat oblique, the commencement of the second dorsal being the highest point. Snout slightly pointed, with the upper profile nearly straight. Dorsal spine of moderate strength, tapering, shorter than the head, situated above the posterior part of the orbit and armed with two series of barbs behind. Caudal fin rounded, sometimes with the upper ray produced into a short filament; dorsal and anal fins of moderate height. Ventral spine moveable, tapering, rough, free from and extending beyond the ventral flap. Brown, irregularly marbled with darker; sometimes a roundish blackish blotch below the anterior third of the dorsal fin.

Australia. (McGillivray.) Length three and a half inches.

1019. *MONACANTHUS GRANULATUS*, White.

Richards. Voy. Erebus and Terror, p. 63, pl. 40, figs. 1-2.

*M. granulatus*, Gunth., Cat. Fishes, VIII., p. 243.

D. 30. A. 28-29. Vert. 7/11.

Body covered with papillæ, each with a round expansion at the top, like a mushroom; in dried examples they shrink, assuming the appearance of a short spine. Body rather oblong, its depth being nearly one-half of the total length (without caudal). Snout moderately produced, with the upper profile slightly concave. Dorsal spine strong, barbed behind, but not in front, rather shorter than the head and situated above the posterior part of the orbit. Caudal fin rounded, of moderate length; dorsal and anal fins low. Ventral spine very short, not moveable. Brownish grey, marbled with dark brown, with the papillæ white; fins olive yellow sprinkled with brown; generally two large dark spots on the belly at the base of the anal fin.

Port Jackson. Length nine inches.

1020. *MONACANTHUS RUDIS*, Richards.

Voy. Erebus and Terror, p. 65, pl. 40, f. 7-8.—Gunth., Cat. Fishes VIII., p. 244.

D. 34-35. A. 34.

Body covered with minute, rough, but distinct scales. Body oblong, its depth being two-fifths of the length without the caudal fin. Pectoral fin situated behind the vertical from the orbit. Snout long, with the upper profile convex. Dorsal spine inserted above the posterior half of the orbit, of moderate strength, two-thirds as long as the head, armed with a double series of small barbs behind, rough in front. Caudal fin rounded; dorsal and anal fins low. Ventral spine very small, fixed. Brown, uniform or with four indistinct, broad, whitish longitudinal bands. Caudal fin with a broad blackish margin.

Tasmania, Port Jackson. Length nine inches.

1021. *MONACANTHUS AYRAUDI*, Quoy & Gaim.

Voy. Uran. Zool. p. 216, pl. 47, f. 2.—Gunth., Cat. Fishes VIII., p. 244.

Syn. *M. vittatus*, Richards., and *Frauenfeldii*, Kner.

D. 32. A. 31.

Skin rough, velvety. Body elongate, its depth being rather less than one-third of the total length without caudal fin. Pectoral fin situated below the hinder half of the orbit, immediately in front of the vertical from the dorsal spine. Snout very long, rather obtuse, with the upper profile a little convex. Dorsal spine rather feeble, compressed in the direction of the longitudinal axis of the body, armed with a single lateral series of barbs. Caudal fin sub-truncate, the upper lobe slightly produced in old examples; dorsal and anal fins elevated in front. Ventral spine very small, fixed. Brownish, with two or four whitish longitudinal bands, the middle one broad and more distinct than the outer, in old specimens the colour is uniform.

Port Jackson. Length eighteen inches.

This species of Leather Jacket is very abundant on the Schnapper Grounds outside of Port Jackson, and is very destructive to the fishermen's lines.

1022. *MONACANTHUS EDELENSIS*, Casteln.

Researches on the Fishes of Australia, p. 50.

D. 33. A. 31.

General form elongate, the height of the body being twice and a half in the length without the caudal fin. Snout produced, the upper profile straight or very little concave; skin entirely velvety; no spines on the tail; caudal fin rounded; ventral spine small, fixed, with its spinlets directed backwards. A perpendicular line drawn from the base of the dorsal spine to that of the pectoral fin would go through the centre of the eye. Dorsal

spine long, straight, with a double series of strong spines directed downwards on its posterior part, and very faint traces of a similar double series, as far distant, on the anterior face. Colour dark brown, beneath lighter; fins light, probably rosy in life.

Swan River. Length seven and a quarter inches.

1023. *MONACANTHUS BRUNNEUS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 108.

D. 35. A. 27. P. 15. C. 7.

Body rather elongate, entirely covered with very fine spines which give it a velvety appearance. The height of the body is contained twice and one-third in the total length, the length of the head three times and two-thirds in the same; the diameter of the eye is one-third of the length of the head. Snout rather concave above; the space between the dorsal fins is convex. The dorsal spine is stout, inserted over the first third of the orbit, covered with fine closely set tubercles, and has on its posterior edge two series of short, thick, conical spines, which towards the base extend to the middle of the breadth of the spine; the second is very visible. Caudal fin rounded; the anal begins behind the second dorsal, and both fins are highest at one-fourth of their length. The ventral spine is formed of a small knob of spinules, with a few longer ones on the sides, and four still longer ones directed obliquely, two forwards and two backwards. Colour chocolate-brown, with the posterior margin of the caudal fin white, the dorsal and anal fins pink, and the pectorals of a light brown. Length three and a half inches.

Knob Island (Torres Straits).

C. Dorsal spine with irregularly arranged barbs and filaments.

1024. *MONACANTHUS PENICILLIGERUS*, Cuv.

Gunth., Cat. Fishes VIII., p. 245.—Bleek. Atl. Ichth. Balist., p. 129, pl. 221, fig. 3.

## D. 26. A. 24.

Body covered with compressed, three-rooted spines, forming irregular longitudinal series. Fringed fleshy filaments on the dorsal and ventral spines, head and body. Body elevated, its greatest depth being contained from once and one-sixth to once and a half in the length without the caudal fin. The origin of the soft dorsal fin is level with, or but little raised above, the base of the dorsal spine. Snout with the upper profile straight or but little concave. Dorsal spine of moderate strength and length, with spinelets irregularly arranged; it is inserted immediately behind the orbit. Caudal fin more or less elongate, especially in old examples. Ventral spine fixed, spiny, projecting beyond the abdominal membrane. Dorsal and anal fins of moderate height. Brownish, irregularly marbled with darker; a round black spot in the middle of the side; some straight black lines along the body and tail. Vertical fins with numerous black dots.

Cape York, Queensland, Freycinet's Harbour.

## D. Dorsal spine without barbs.

1025. *MONACANTHUS TROSSULUS*, Richards.

Voy. Erebus and Terror, p. 68, pl. 40, f. 5-6.—Gunth., Cat. Fishes VIII., p. 234.

## D. (25) 28. A. (23) 26.

Skin densely covered with slender, flexible, acute bristles, which are so delicate as to give a velvety feel to the finger. Body elevated; the height from the second dorsal fin (the highest point) to the point of the pelvic bone is equal to the length without caudal fin. Snout obtuse with the upper profile nearly straight. The dorsal spine stands over the middle of the orbit, and is roundish, much shorter than the head, and densely covered with minute grains, which lengthen into very fine acicular bristles. No ventral spine. Dorsal and anal fins low. Blackish

green, with some minute darker specks and dots of a pale colour scattered over the body, and most crowded on the face and flanks. Along the pelvic bone and near the abdomen the dots run into streaks.

West Australia, Victoria, Port Jackson.

1026. *MONACANTHUS OCULATUS*, Gunth.

Gunth., Cat. Fishes, VIII., p. 235.

D. 24. A. 22.

Skin densely covered with minute bristles, producing a velvety appearance. Outline of the body subcircular, its depth being contained once and one-third in the length without the caudal fin. No pelvic protuberance. Snout very obtuse, not projecting. The dorsal spine is rather stout but short, placed behind the eye and about as long as the orbit; it has no barbs. Dorsal and anal fins of moderate height. Olive-coloured (in spirits) with about nine rather irregular longitudinal rows of purplish ocelli edged with white, and about as large as the pupil of the eye.

South Australia, Port Jackson. Length one and a half inch.

1027. *MONACANTHUS BAUERI*, Richards.

Voy. Erebus and Terror, p. 68.

D. 26-27. A. 21. C. 9. P. 6-7.

Form inflated as in *Tetrodon*. Snout short and slender. Belly rounded and prominent without any ventral spine. The dorsal fin stands over the orbit, and has the usual triangular slip of membrane behind it. The second dorsal and anal fins are highest anteriorly, but with rounded summits and terminating close to the caudal fin, which is rounded. Skin densely clothed with hair-like spines. Colour bright grass-green, with seven interrupted dark brown longitudinal stripes; nine short bars radiate from the orbit, and on the belly and flanks beneath the stripes are many white specks. The rays of the caudal fin are grass-

green, spotted in cross-rows with umber-brown; the pectorals have a neutral tint; the dorsal and anal are yellow, with three rows of black specks between the bases of the rays, and four rows of pale specks disposed in pairs between the tips of the rays.

Coasts of Australia. Length four inches.

Only known from a drawing by Mr. Ferdinand Bauer in Dr. Brown's possession.

1028. *MONACANTHUS DISTORTUS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 146.

D. 27-28. A. 27-28. P. 10. C. 15.

The upper profile of the head straight and oblique up to the dorsal spine, behind this a large gap or emargination, and behind this the back is very elevated and gibbous; the lower profile is developed into a large rounded ventral pouch, without ventral spine, behind the ventral pouch there is a large gap or emargination similar and opposite to that on the back. The height of the body at the dorsal spine is nine-tenths of the total length, the height a little further back at the depression, is two-thirds of the same; the eye is nearly as long as the muzzle. The dorsal spine is slender, arched, pointed, covered with short spinous bristles, and inserted over the posterior third of the eye. The skin is entirely covered with very short spines, which become longer and more slender on the tail. Colour brown with the fins yellow.

West Australia. Length two and a half inches.

2. *Anal fin with forty or more rays.*

1029. *MONACANTHUS MACRURUS*, *n. sp.*

D. 42. A. 46. C. 8. P. 14.

Body elongate; the height about one-sixth of the total length. Snout very long, about six times the diameter of the eye in

length. Profile above concave, the mouth opening upwards, with three triangular very acutely pointed incisors in each jaw, and with the chin round, prominent and extending beyond the mouth. Dorsal spine short, the length less than the diameter of the orbit, irregularly and densely covered with spinelets, and situated over the posterior third of the orbit; there are two minute rays behind it in the usual membrane. No ventral spine; caudal fin of very strong rays, of pointed form, the middle rays very long, nearly one-third of the total length. Skin velvety with very minute spines. Colour in spirits brownish-grey, indistinctly marked with spots and bars, most conspicuous on the tail; in fresh specimens the ornamentation is most elaborate.

Port Jackson. Length seven inches.

#### Genus ANACANTHUS, Gray.

Body compressed, elongate, covered with minute asperities. Dentition as in *Monacanthus*. The first dorsal fin reduced to a single feeble spine. Ventral fins none. Lower jaw with a fleshy barbel. Vertebrae 20-30.

East Indian Archipelago, Australia.

#### 1030. ANACANTHUS BARBATUS, Gray.

Gunth., Cat. Fishes, VIII., p. 255.—Bleek., Atl. Ichth. Balist., pl. 5, t. 226.

D. 44-51. A. 59-65.

The height of the body is two-fifths of the length of the head, which is two-fifths of the total length without the caudal fin. Caudal fin very elongate, longer than the head. Dorsal spine very feeble, setiform, above the hind margin of the orbit.

West Australia. (Macl. Mus.)

#### Genus OSTRACION, Artedi.

The integuments of the body are modified into a carapace composed of juxtaposed hexagonal osseous scutes, the snout,



bases of the fins, and hind part of the tail being covered by soft skin. Mouth small, maxillary and inter-maxillary bones coalescent, each jaw with a single series of small slender teeth. One short dorsal fin (without spine) opposite to the short anal. Ventral fins none. Vertebræ fourteen, the five last extremely short, the anterior sub-elongate; ribs none.

Tropical and Sub-tropical Seas.

A. *Carapace closed behind the anal fin.*

1031. OSTRACION CONCATENATUS, Bl.

Gunth., Cat. Fishes VIII., p. 259.

Carapace three-ridged, forming a broad continuous bridge across the back of the tail. Dorsal ridge with two compressed small spines placed close together, each ventral ridge with two similar spines remote from each other. Supra-orbital edge with a very small or minute spine, pointing backwards and outwards; it is frequently absent, sometimes double. All these spines become less prominent with age, and only traces of them can be discovered in full grown specimens (eight to ten inches). Inter-orbital space concave. Adults with some horizontal dark stripes on the cheek.

Port Jackson.

1032. OSTRACION CUBICUS, Lin.

Gunth., Cat. Fishes, VIII., p. 260. (Many synonyms.)

Carapace four-ridged, without spines, forming a broad continuous ridge across the back of the tail. Ridges rather blunt. Back slightly convex, without raised ridge in the median line. Inter-orbital space concave. Snout with a hump immediately above the mouth, in very old examples. Body with bluish black-edged ocelli, not more than one on a scute; but frequently the ocelli are absent on the abdomen or head, or on a portion of the sides or back. Head, sides, and abdomen frequently with

black dots. Tail immaculate, or with black, never with white, dots. *Young* with scattered large black dots.

Port Darwin, Fair Cape. (Chevert Exp.) Length fifteen inches.

1033. OSTRACION RHINORHYNCHUS, Bleek.

Atl. Ichth. Ostrac., p. 37, pl. 1 & 3.—Gunth., Cat. Fishes, VIII., p. 263.

Carapace four-ridged, without spines, forming a continuous bridge across back of the tail. The median line of the back is distinctly raised. Inter-orbital space very slightly concave. Snout with a hump, which in adults is but little below the level of the forehead. Back and tail, and sometimes the sides with numerous small brown dots (2-10 on one scute). Abdomen immaculate.

North-west Australia. (Duboulay.)

1034. OSTRACION DIAPHANUS, Bl.

Gunth., Cat. Fishes VIII., p. 264.—Hollard, Ann. Sc. Nat. 1857, VII., p. 157.

*Acanthostracion cornutus*, Bleek., Atl. Ichth., Ostrac., pl. 2 and 4.

Carapace four-ridged; the broad bridge across the back of the tail is formed by four transverse series of scutes. A pair of short conical spines *divergent*, and pointing forwards in front of the orbits. A triangular compressed spine in the middle of the back; generally a small spine on each dorsal ridge, opposite to the central spine. Ventral ridge terminating behind in a strong flat spine, and frequently with two other smaller spines on the side. Interorbital space deeply concave. Caudal fin of moderate length. Sometimes of uniform coloration, sometimes with bluish, sometimes with black spots.

Port Jackson.

## 1035. OSTRACION CORNUTUS, Linn.

Gunth., Cat. Fishes, VIII., p. 265.—Hollard, Ann. Sc. Nat. 1857, VII., p. 158.

Carapace four-ridged, forming a broad bridge across the back of the tail. A long conical spine above each orbit, pointing forwards. Each ventral ridge terminates behind in a similar long spine pointing backwards. Each dorsal ridge with a slight prominence in the middle of its length, but it is not developed into a spine. Median line of the back slightly raised, without spine. Inter-orbital space deeply concave. Caudal fin very long in adults, with simply bifid rays. Carapace and tail with round bluish and blackish spots in moderate number, of the size of the pupil of the eye.

Port Jackson, Endeavour River. Length fourteen inches.

B. *Carapace not closed behind the anal fin.* (*Aracana*, Gray).

## 1036. OSTRACION AURITUS, Shaw.

Richards., Trans. Zool. Soc., III., p. 160, pl. 9.—Gunth., Cat. Fishes, VIII., p. 266.

Back without, abdomen with a crest. Spines: one above the hind part of the orbit pointing backwards; two on each side of the back, rather close together; one in the middle of the side; and two or three on each side of the abdomen. Anterior profile of the snout without hump. Head and body with longitudinal, more or less undulated brown (silver or golden) stripes, much narrower than the interspaces; there are four of them on each check. In old preserved specimens the ornamental colours disappear, the entire fish being of almost uniform coloration.

Tasmania, South Australia. Length six inches.

## 1037. OSTRACION ORNATUS, Gray.

Richards., Trans. Zool. Soc., III., p. 161-5, pl. 10—11.—Gunth. Cat. Fishes VIII., p. 267.

Back without, abdomen with a crest. Spines : one above the middle of the orbit, nearly erect, pointing upwards and outward ; two on each side of the back ; one in the middle of the side ; two on each side of the abdomen, the foremost being well developed, and situated immediately behind the root of the pectoral fin. Snout in adults with a more or less developed hump. Head and body with numerous alternate brown and yellow longitudinal stripes ; the brown are broader than the yellow, there are about seven on each side of the head. The stripes on the body are sometimes broken up into small spots.

Tasmania, South Australia. Length five inches.

1038. OSTRACION LENTICULARIS, Richards.

Proc. Zool. Soc., 1841, p. 21.—Gunth., Cat. Fishes, VIII., p. 268.

Carapace much compressed, back and abdomen compressed into a crest ; no spines, sometimes the centre of each scute slightly raised. Colour pink with yellow tints, on the sides and back some spots of an ochreous yellow, having the centre darker ; lower parts of the body and mouth of a rose colour, becoming darker towards their extremities. Length twelve inches.

Port Jackson, South Australia.

1039. OSTRACION AMENUS, Casteln.

*Aracana amana*, Casteln. Proc. Zool. Soc. Victoria, Vol. I., p. 207.

Carapace with five ridges, the abdomen forming an inferior one ; spines short, thick, conical, blunt, not arched, placed one above the orbit, pointing outwards ; two on each side of the back, pointing backwards ; beneath these are others still shorter and which are merely white striated tubercles, these are placed, one on each side towards the middle, and three on a line at the beginning of the belly,—one is under and a little behind the root of the pectoral fin, the other two close together and more behind. The entire carapace is rough and covered with small

tubercles. Caudal fin long and rounded. Colour above and on the sides dark purple with numerous white narrow longitudinal lines, running all round the body, four of these on the cheeks; the belly is orange, the fins yellow, immaculate.

Port Phillip. (Casteln.) Length two inches.

## FAMILY II. GYMNODONTES.

Body more or less shortened. The bones of the upper and lower jaw are confluent, forming a beak with a trenchant edge, without teeth, with or without median suture. A soft dorsal, caudal and anal fin are developed, approximate. No spinous dorsal. Pectoral fins. No ventrals.

### Genus TETRODON, Bibr.

Jaws divided by a median suture. Body with or without small dermal ossifications. Dorsal and anal fins short, with the rays in small number.

Tropical and Sub-tropical Seas; some species in rivers.

#### 1040. TETRODON LEVIGATUS, L.

Gunth., Cat. Fishes VIII., p. 274. (Synonyms numerous.)

Body entirely naked above and on the sides; abdomen with small three-rooted spines. The length of the head is equal to the distance of the gill-opening from the dorsal fin. Caudal fin forked in adults, sub-truncate in young. Uniform greenish above, sides silvery, abdomen white.

Port Jackson, Torres Straits.

#### 1041. TETRODON LUNARIS, Bl.

Gunth., Cat. Fishes, VIII., p. 274.—Bleek. Atl. Ichth. Gymnod.  
pl. 1, fig. 2.

*Tetrodon spadiceus* Richards. Bleek. Atl. Ichth. Gymnod., pl. 3,  
fig. 1.

Castelnau, Proc. Linn. Soc. N. S. Wales, Vol. III., p. 400.

Moreton Bay.

1042. *TETRODON SCELARATUS*, L.

Gunth., Cat. Fishes, VIII., p. 276.

*T. argenteus*, Bleek. Atl. Ichth. Gymnod., p. 64, pl. 5, fig 1.

Head and back finely shagreened above; abdomen with very small three-rooted spines. Sides naked. Body elongate; tail depressed. The length of the head is less than its distance from the dorsal fin. Caudal fin emarginate. Sides with a well defined silvery band; the parts above the band brownish, with small blackish spots. The brown colour encircles the eye; a triangular silvery spot in front of the eye. A brownish band round the chin runs along and below the silvery band. Gill-opening deep black.

South Australia. Length twenty-seven inches.

1043. *TETRODON HYPSELOGENION*, Bleek.

Atl. Ichth. Gymnod., p. 61, pl. 9, fig. 5.—Gunth., Cat. Fishes, VIII., p. 277.

Back from the inter-orbital space to near the dorsal fin, and nearly the entire abdomen, with spines, which are rather distantly placed, and comparatively, not very small; a cross-band unites the dorsal and abdominal spines behind the pectoral fin, the remainder of the side being naked. The length of the head equals its distance from the dorsal fin. Caudal fin truncate. The upper teeth more than half as large as the lower. The osseous inter-orbital space very narrow, narrower than the eye. Above brown or black, with numerous small round whitish spots. Sides with a broad silvery band, separated from the colour of the back by a longitudinal black stripe, sometimes another shorter stripe along its middle. Lower parts white. Cheek with from three to five sub-vertical brown bars.

Port Jackson. Length five to six inches.

## 1044. TETRODON OBLONGUS, Bl.

Gunth., Cat. Fishes VIII., p. 278.—Bleek., Atl Ichth., Gymnod.,  
pl. 4, fig. 4.

Back and belly covered with small two rooted spines, the snout and tail naked; the sides are generally crossed by two broad stripes of spines in front and behind the pectoral fin. The length of the head is nearly equal to its distance from the dorsal fin. Caudal fin truncate. The upper teeth not much smaller than the lower. The osseous inter-orbital space is broad in adults, its width being equal to the length of the snout. Upper part of the head and middle of the back brown, with round white spots; on the sides the brown colour descends in irregular transverse bands. Frequently the distribution of the colours on the sides is the same as on the middle of the back; that is, all the upper part of the fish is brown, with round white spots (var. *alboplumbeus*). Frequently a large round, black spot above the end of the pectoral fin. Length twelve to fifteen inches.

King George's Sound.

## 1045. TETRODON HAMILTONI, Richards.

Voy. Erebus and Terror, p. 63, pl. 39, figs. 10 and 11.—Gunth.,  
Cat. Fishes VIII., p. 280.

The back and abdomen are covered with minute spines; frequently nothing is visible of the spines, except the pores in which they are lodged, and then the entire fish is smooth to the touch, some specimens are entirely spineless. Snout short, only one-half longer than the eye, and equal to the width of the osseous inter-orbital space. The length of the head is less than its distance from the dorsal fin. Caudal fin rounded. Lower lateral fold distinct. Upper parts brown, with numerous close round black spots; cheeks with some brown vertical bands or spots; some large dark blotches on the sides; sometimes an indistinct dark band across the back. Lower parts white.

Port Jackson. Length five and a half inches.

## 1046. TETRODON RICHEL, Freminv.

Gunth., Cat. Fishes, VIII., p. 285.—Bleek. Atl. Ichth. Gymnod.,  
pl. 9, fig. 3.

Body, from the lips, densely covered with minute spines. Caudal peduncle smooth. Snout rather obtuse; the eye being somewhat nearer to the end of the snout than to the gill-opening. Infra-orbital space broad. Orbit with a free fold in its entire circumference. Light brownish above, with irregular blackish spots and blotches. Lower parts uniform white.

South Australia, Tasmania. Length eleven inches.

## 1047. TETRODON VIRGATUS, Richards.

Voy. Erebus and Terror, p. 62, pl. 39, figs. 8 & 9.—Gunth., Cat. Fishes, VIII., p. 291.

Small spines cover the entire body, with the exception of the lips and the posterior half of the tail. Snout short and obtuse, rather more than two-fifths of the length of the head, and equal to the width of the inter-orbital space which is flat. Length of the caudal fin equal to its distance from the front margin of the dorsal fin. Body and sides with from six to twelve parallel greyish longitudinal lines on each side. Caudal fin with the upper and lower margins black; root of the pectoral fin black.

Cape York, Port Darwin, Port Jackson. Length ten inches.

Said to be synonymous with *T. immaculatus*, Bloch.

## 1048. TETRODON PATOCA, Ham. Buch.

Gunth., Cat. Fishes, VIII., p. 288.—Bleek. Atl. Ichth. Gymnod.,  
pl. 6, fig. 2.

Back and abdomen densely covered with very small spines, the snout and tail and a band along the sides being naked. Snout obtuse, convex, its length being less than the width of the inter-orbital space, which is rather convex. Upper parts



brownish, with more or less numerous round whitish spots. Sides silvery; abdomen white. A simple, non-perforate nasal cavity with a fringed edge.

Port Darwin.

1049. *TETRODON FASCIATUS*, Maccl.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 365, pl. 10, fig. 5.

Port Darwin.

1050. *TETRODON BIBRONI*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 247.

Moreton Bay.

1051. *TETRODON STAIGERI*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 248.

Moreton Bay.

1052. *TETRODON PLEUROSTICTUS*, Gunth.

Proc. Zool. Soc. Lond., 1871, p. 674, pl. 69, fig. A.

The lower side of the tail with a distinct ridge-like fold. The two nasal openings on each side are in a single papilla. The anterior part of the abdomen and sometimes the middle of the back of the trunk with minute spines; the remainder of the fish being entirely smooth. Snout short, its length being less than the width of the inter-orbital space. The length of the head equals its distance from the dorsal fin. Caudal fin truncate. Upper parts brown; sides greyish, gradually passing into the white of the lower parts. A series of three black round spots on each side of the body—the first corresponding to the upper posterior corner of the pectoral fin, the second below the end of the dorsal, and the third on the upper half of the tail near the base of the caudal fin.

Port Bowen, Port Mackay. Length four inches.

## 1053. TETRODON HISPIDUS, L.

Gunth., Cat. Fishes VIII., p. 297.

*Crayracion laterna*, Bleck. Atl. Ichth. Gymnod., pl. 1., fig. 3.

Very small spines cover the whole body from the snout to the space between the dorsal and anal fins, the hind part of the tail being naked; abdominal spines with two, three, or four short roots. Two solid nasal tentacles without opening on each side. Snout of moderate length, with the upper profile slightly concave. Orbit prominent, situated in the middle of the length of the head. Inter-orbital space concave, not twice as broad as the orbit. Length of the caudal fin equal to its distance from the front margin of the dorsal. Brown above with not very numerous rounded bluish-white spots. One or two bluish rings round the gill-opening, pectoral fin, and orbit. The lower parts of the sides are variously marked with either blotches or vertical or longitudinal bands or stripes.

Port Jackson. Length twenty inches.

## 1054. TETRODON FIRMAMENTUM, Schleg.

Gunth., Cat. Fishes, VIII., p. 299.

Small two-rooted spines cover the entire body, except the snout and the posterior part of the caudal peduncle; there are about fifty spines in a longitudinal series between the nostril and dorsal fin. Two solid nasal tentacles without opening on each side. The length of the snout is contained twice and two-thirds in that of the head, and is a little less than the width of the inter-orbital space, which is rather convex. Greyish above, lighter below, all parts with ovate white spots, smaller than the eye, and than the interspaces of the ground colour.

Port Jackson. Length eleven inches.

## 1055. TETRODON DARWINII, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 94.

The height of the body is one-fourth of the total length, the width nearly the same; the diameter of the eye is three times and a half in the length of the head. The nasal openings are on a prominent papilla in front of the eye. Snout rather obtuse. Two-rooted minute spines cover the upper part of the head and the back to near the end of the pectoral fins, where they terminate in forming a triangle. The front part of the head and checks are smooth, the spines beginning behind the nostril. The throat and belly are covered with small spines and pores. The dorsal fin is situated equidistant between the snout and the end of the tail. Caudal fin truncated, its length being about equal to the breadth of the back. Colour in spirits slaty blue above, beneath yellowish; fins yellow. Without spots.

Port Darwin. Length three and a half inches.

1056. *TETRODON MARMORATUS*, Casteln.

*Crayracion marmorata*, Casteln. Proc. Zool. Soc. Victoria, Vol. II., p. 148.

One nasal opening only on each side. The upper anterior part of the body from near the end of the pectoral fins to the head, covered with rather strong spines placed a considerable distance from one another; the rest of the head and body smooth. Dorsal fin of eleven rays; caudal of eight long rays, ventrals of ten, and pectorals of sixteen. Above dark brown, covered with very numerous irregular round whitish spots; lower parts and fins yellow.

West Australia. Length five and a half inches.

1057. *TETRODON LINEATUS*, Bl.

Bleek. Atl. Ichth. Gymnod., p. 70, pl. 8, fig. 1.—Gunth., Cat. Fishes, VIII., p. 295.

Small but rather prominent spines cover the entire body, extending forward to or nearly to the lips, and behind nearly to

the root of the caudal fin. Snout short, obtuse, two-fifths or more of the length of the head, and rather more than the width of the inter-orbital space, which is flat or but slightly concave. On each side two solid nasal tentacles without opening. Length of the caudal fin equal to its distance from the dorsal. Colour of a greenish olive with very numerous bluish dots; the abdomen which is very large is beautifully marked with white or yellow fasciæ; fins yellow.

Port Jackson.

1058. *TETRODON ANABILIS*, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 401.

Port Jackson.

Genus *Diodon*, L.

Jaws without median suture. Body covered with dermal ossifications, each with a pair of lateral roots, and with a stiff, moveable, and erectile spine. Nasal tentacle simple, with a pair of lateral openings.

Tropical Seas.

1059. *DIODON HYSTRIX*, L.

Bleek. Atl. Ichth. Gymnod., p. 56, pl. 3, fig. 2.—Gunth., Cat. Fishes, VIII., p. 306.

Spines strong, dilated at the base, and with a pair of basal grooves; the post-pectoral spines are the longest, about as long as the pectoral fin, those of the posterior part of the back short and broad. Frontal spines of medium size. The upper and lower side of the tail with two or three pairs of immovable spines. All the upper and lateral parts and the fins with numerous small round black or brown spots.

Port Jackson. (Castelnau.)

1060. *DIODON SPINOSISSIMUS*, Cuv.

Gunth., Cat. Fishes, VIII., p. 307.

All the spines long, slender, with an anterior ridge between a pair of grooves, not extending beyond a third of the length of the spine. Upper part of the tail with a pair of spines besides those on the sides. The roots of the spines are strong and long, half as long as the spine or longer. There are about seventeen transverse series of spines between the snout and dorsal fin. A more or less distinct blackish band runs from one eye to the other across the throat; sometimes another vertical band in front of the gill-opening. Upper parts blackish, base of each spine with a black spot. Abdomen white.

Port Phillip, West Australia (Castelnau).

1061. *DIODON NOVEMMACULATUS*, Cuv.

Bleek. Atl. Ichth. Gymnod., p. 57, pl. 2, fig. 3.—Castelnau Proc. Linn. Soc. N.S. Wales, p. 401.—*Atopomycterus Boragei*, Steindacher.

Port Jackson.

1062. *DIODON BLOCHII*, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 210.

“*Sea Hog*” of Melbourne.

Spines less numerous than in *D. hystrix*. Head broad; mouth wide; the interorbital space equal to two diameters of the orbit; five spines in the first row before the eyes; in all eleven or twelve transverse irregular series, all strong; but particularly the posterior ones. Dorsal fin 13; caudal 9, A. 13, P. 19. Each spine has two long roots and an anterior ridge. Colour pale green on the back, white on the belly, at the root of each spine there is a faint brown spot, and on the posterior part of the body some purple blotches. The fins are green, and immaculate,

with darker margins, the eye is orange, and surrounded by a blue ring. Length six inches.

Port Phillip.

Genus *CHILOMYCTERUS*, Bibr.

Jaws without median suture. Body covered with dermal ossifications, all or most of which consist of three horizontal roots and a stiff erect immovable spine. Nasal tentacle simple, with a pair of lateral openings.

Tropical and Sub-tropical Seas.

1063. *CHILOMYCTERUS JACULIFERUS*, Cuv.

Gunth., Cat. Fishes VIII., p. 313.—Proc. Zool. Soc., Victoria, Vol. I., p. 211.

Two spines above the orbit; none in the middle of the forehead; no tentacle; there are only five spines in a straight, longitudinal series from the parietal spine to the side of the dorsal fin. Inter-orbital space quite flat; nostrils in front of the orbit. The roots of four spines surround the tail behind the dorsal and anal fins. Spines on the lower parts rather feeble. Jaws strong. P. 19. D. 16. A. 15. C. 9. Three black spots on each side of the body: one in front of the gill-opening, one behind the pectoral fin and a third somewhat in advance of the dorso-anal interspace.

Hobson's Bay (Castelnau).

Genus *DICOTYLICHTHYS*, Kaup.

Jaws without median suture. Body covered with dermal ossifications, each of which is provided with a spine; the anterior are two-rooted and erectile, the posterior three-rooted and immoveable. Nasal tentacle with two cylindrical and tapering branches; no nostril.

Australia; Cape of Good Hope.

1064. *DICOTYLICHTHYS PUNCTULATUS*, Kaup.

Gunth., Cat. Fishes VIII., p. 315.

Dorsal spines much shorter than those on the sides and abdomen, those in front of the pectorals erectile, those behind three-rooted. Back of the tail without ossifications; but a root of the last dorsal spine reaches across behind the dorsal fin. About thirteen transverse series of spines between the snout and the dorsal fin. Body with small, round scattered black spots. A black vertical bar below the eye, a second in front of, and a third behind the root of the pectoral fin.

Port Jackson. Length ten or twelve inches.

Genus *ATOPOMYETERUS*, Kaup.

Characters the same as *Dicotylichthys*, but the dermal ossifications each provided with two rooted erectile spine.

Australia.

1065. *ATOPOMYCTERUS NYCHTHEMERUS*, Cuv.

Gunth., Cat. Fishes VIII., p. 315.

All the spines slender, rounded, without ridge. Upper part of the tail without spine. The roots of the spines are very short and feeble. About thirteen transverse series of spines between the snout and the dorsal fin. Upper parts blackish-brown; in young individuals the dark colour descends on the sides in four bands, viz., below the eye, in front of and behind the pectoral fin, and above the vent.

Tasmania, South Australia. Length ten or twelve inches.

Genus *ORTHAGORISCUS*, Bl.

Jaws without median suture. Tail extremely short, truncate; vertical fins more or less confluent. Body compressed, short, covered with a rough or tessellated skin not capable of being

expanded by air. Ventral fins none. No pelvic bone. Air bladder absent. An accessory opercular gill.

The seas of the whole World.

1066. ORTHAGORISCUS MOLA, L.

Gunth., Cat. Fishes VIII., p. 317. "*Sun Fish.*"

Body elevated, its depth being more than the length. Skin rough, minutely granulated. Dorsal and anal fins narrow, high. Eye much nearer to the upper profile than to the lower.

Australian Seas.

A stuffed specimen of this Fish in the Macleay Museum, captured about six years ago in Port Stephens, measured about ten feet in length, and nearly fourteen feet in height.

SUB-CLASS II. *PALYICHTHYES*.

*Fishes with the skeleton wholly or partly cartilaginous. Heart with a contractile bulbus arteriosus; intestine with a spiral valve; optic nerves non-decussating.*

ORDER I. *GANOIDLÆ*.

*Fishes with the skeleton more or less ossified. Bulb of the aorta muscular, with numerous valves. Branchiæ free; gill-cavity protected by a gill-cover. Intestine with a spiral valve. Optic nerves not decussating. Ventral fins abdominal if present.*

Genus CERATODUS, Agassiz.

A genus formed by Agassiz on a fossil tooth. It probably is referable to the Family *Sirenoidei*.

1067. CERATODUS FORSTERI, Krefft.

Proc. Zool. Soc., London, 1870, p. 222, pl.—figs. 1-2-3.

General form of *Osteoglossum*; scales large, cycloid. I. lat. 35. I. transv. 8. Vent in the posterior third of the total length.



Vertical fins confluent, the dorsal commencing in the middle of the body. The paired fins long, paddle-shaped, with a central scaly axis bearing a rayed membrane above and below. Ventral fins far back. Gill-opening a narrow slit. The upper and lower jaw armed with a pair of very large six or seven-pronged teeth. Skeleton semi-cartilaginous.

Burnett and Dawson Rivers. Length three feet.

1068. CERATODUS MIOLEPIS, Gunth.

Phil. Trans. 1871, part 2, p. 516.

This species has more scales on the transverse line than *C. Forsteri*, but is in other respects alike. It is probably only a variety.

Burnett River.

1069. OMPAX SPATULOIDES, Castelnau.

The description of this genus and species will be found, with all the details known or remembered, in the Proceedings of the Linnean Society of New South Wales, Vol. III., p. 164, pl. 19 A., figs. 1-2-3. I think it is probable that no such Fish was ever found, but I give it a place in my Catalogue, in order to direct attention to the subject, as the likelihood of finding Ganoid Fishes in Queensland waters is asserted by several very distinguished Naturalists.

## ORDER II. CHONDROPTERYGII.

*Skeleton cartilaginous; skull without sutures. Body with medial and paired fins, the hinder pair abdominal; caudal fin with produced upper lobe. Gills attached to the skin by the outer margin, with several intervening gill-openings; rarely one gill-opening only. No gill-cover. No air-bladder. Three series of valves in the bulbus arteriosus. Intestine with a spiral valve. Optic nerves commissurally united, not decussating. Ovaries with few and large ova, which are impregnated*

and in some developed internally. Embryo with deciduous external gills. Males with prehensile organs attached to the ventral fins.

1. One external gill-opening, covered by a fold of the skin. (Order *Holocephala*, Gunther).

#### FAMILY CHIMÆRIDÆ.

Form of the body elongate; pectoral fins free; anterior dorsal fin above the pectorals. Mouth inferior. Ventral organs confluent into two pair of laminae in the upper jaw, and into one pair in the lower. No spiracles. Males with a peculiar prehensile organ on the upper part of the snout. Skin naked in the adult.

#### Genus CALLORHYNCHUS, Gronov.

Snout with a cartilaginous prominence, terminating in a cutaneous flap. Two dorsal fins, the anterior with a very long and strong spine. Extremity of the tail distinctly turned upwards, with a fin along its lower edge, but without one above. Anal fin close to the caudal, short and deep.

South Pacific, Cape of Good Hope.

#### 1070. CALLORHYNCHUS ANTARCTICUS, Lacep.

Gunth., Cat. Fishes VIII., p. 351. Syn. *C. Peronii* and *Capensis*, Dum. *C. Australis*, Shaw and Owen; and *C. tasmanius*, Richardson.

The second dorsal fin elevated in front. Pectoral fin very large, extending generally to, or even beyond, the base of the ventral. Claspers sub-cylindrical, with a channel along the interior, opening by a lateral slit. Adult with an obscure blackish lateral band. Young with the upper parts black, and with whitish bands and spots. The young have also a double series of very small dermal spines on the crown of the head, and on the back of the trunk and tail; these spines are also

sometimes found in half grown and adult examples, in which, however, they are hidden in the skin.

Coasts of Australia and Tasmania.

2. *From five to seven gill-openings.* (Order *Plagiostomata*, Gunth.)

#### SUB-ORDER I. SELACHOIDEI.

*Body more or less cylindrical, gradually passing into the tail. Gill-openings lateral.—Sharks.*

#### FAMILY I. CARCHARIIDÆ.

Eye with a nictitating membrane. An anal fin. The first dorsal opposite to the space between the pectoral and ventral fins, without spine. Mouth crescent-shaped, inferior.

#### GENUS CARCHARIAS, CUV.

A pit at the root of the caudal fin, which has a distinct lower lobe. Spiracles none. Mouth crescent-shaped; the labial groove or fold is confined to, or does not extend much beyond, the angle of the mouth. Snout produced longitudinally. Teeth with a single sharp cusp, more or less dilated and triangular.

Temperate and Tropical Seas.

#### 1071. CARCHARIAS ACUTIDENS, Rüpp.

Gunth., Cat. Fishes VIII., p. 361.—Mull. & Henle, p. 33.

Snout short and obtuse. Pectoral fins pointed, but little extending beyond the origin of the dorsal. The second dorsal fin is but little smaller than the first, and very similar in size and form to the anal. Nostril with a very distinct valve at its lower half. A short groove at the angle of the mouth. Gills of moderate width. Teeth 27/27-29/29, not serrated.

Torres Straits.

1072. *CARCILARIUS MÜLLERI*, Mull. & Henle.

Mull. & Henle, p. 30, pl. 19, fig. 1, teeth.—Dum. Elasmobr., p. 347.—Gunth., Cat. Fishes, VIII., p. 360.

Snout elongate and pointed; mouth nearly as long as broad. Teeth in the middle of the lower jaw small, those on the sides much larger and swollen at the base, with an oblique narrow cusp; the upper teeth flat and oblique, none denticulated. End of the base of the first dorsal fin opposite to the origin of the ventrals. Second dorsal very small; anal in advance of the second dorsal.

Cape York.

1073. *CARCHARIAS MACLOTI*, Mull. & Henle.

Mull. & Henle, p. 34, pl. 10.—Dum. Elasmobr., p. 350.—Gunth., Cat. Fishes, VIII., p. 362.

Snout long, pointed, the nostrils being nearer the mouth than to the extremity of the snout. The teeth of the upper jaw with the base denticulated on both sides; lower teeth without denticulations.

Port Jackson.

1074. *CARCHARIAS GLAUCUS*, L.

Mull. & Henle, p. 36, pl. 11.—Dum. Elasmobr., p. 353.—Gunth., Cat. Fishes, VIII., p. 364.

“*The Blue Shark*” of European Seas.

Snout very long, nostrils rather nearer to the mouth than to the extremity of the snout. No labial fold, except a groove at the angle of the mouth. Teeth serrated, those of the upper jaw oblique, scarcely constricted near the base; those of the lower jaw slender, triangular in young specimens, lanceolate with a broad base in adults. Pectoral fin long, falciform,

extending to the dorsal, which is nearer to the ventrals than to the root of the pectorals. Tail and caudal fin slender.

Port Arthur (Tasmania).

1075. *CARCHARIAS GANGETICUS*, Mull. & Henle.

Mull. & Henle, p. 39, pl. 13.—Dum., *Elasmobr.* p. 359.—Gunth.  
Cat. Fishes VIII., p. 367.

Snout very short and obtuse; nostrils very close to the extremity of the snout. Teeth serrated, 27/27-30/30, those of the upper jaw triangular, their outer edge with a slight trace of a notch; those of the lower jaw denticulated like the upper, erect, narrow, with broad base. Pectoral fin elongate, falciform. The first dorsal fin commences immediately behind the base of the pectoral and has the anterior margin not convex.

Port Jackson. Length thirty inches.

1076. *CARCHARIAS BRACHYURUS*, Gunth.

Gunth., Cat. Fishes, VIII., p. 369.

Snout rather pointed, of moderate length, the distance between its end and the mouth being more than the length of the mouth, and about two-thirds of its width. Nostrils much nearer to the mouth than to the end of the snout, but nearer to the end of the snout, than to the angle of the mouth. Teeth in the upper jaw oblique, serrated on both margins, and with a deep notch on the outer margin; teeth of the lower jaw narrow, erect, lanceolate, serrated, on a broad two-rooted base. Gill-openings at least twice as wide as the eye. Pectoral fins narrow, pointed, falciform, the length of their inner margin being one-fourth of that of the outer. Dorsal fin rather nearer to the pectorals than to the ventrals, its distance from the pectorals being but little less than the length of its base. The second dorsal very small, shorter and lower than the anal. Origin of the anal opposite to that of the second dorsal, and midway between the ventral and caudal

fins. The length of the caudal is one-fourth of the total length. Coloration uniform.

Port Jackson. Length five to eight feet.

1077. *CARCHARIAS MELANOPTERUS*, Mull. & Henle.

Mull. & Henle, p. 43, pl. 19, fig. 5.—Dum., *Elasmobr.*, fig. 305.—  
Gunth., *Cat. Fishes*, VIII., p. 369.

Snout short and obtuse; the nostrils being nearer to its extremity than to the mouth. Teeth 25/25-31/31, the upper oblique, with the inner margin straight, and the outer notched; the lower narrower; both serrated. Pectoral fin falciform, the upper margin being thrice as long as the lower, extending to the end of the dorsal. The first dorsal is only a little nearer to the root of the pectoral, than to that of the ventral. Second dorsal opposite to the anal, to which it is similar in size and shape. Extremities of all the fins deep black.

Torres Straits, Port Darwin.

The shark mentioned by me under the name of *C. hemiodon*, *Proc. Linn. Soc. New South Wales*, Vol. II., p. 366, is I find *C. melanopterus*.

Genus *GALEOCERDO*, Muller & Henle.

The first dorsal fin opposite to the space between the pectorals and ventrals, without spine. Caudal fin with a double notch. A pit on the tail, above and below, at the commencement of the fin. A nictitating membrane; pupil of the eye rounded. Small spiracles. Mouth crescent shaped. Teeth sub-equal in both jaws, oblique, serrated on both margins, with a deep notch on the outer margin.

All Seas.

1078. *GALEOCERDO RAYNERI*, MacDONALD & BARRON.

*Proc. Zool. Soc.*, 1868, p. 368, pl. 32.—Rams., *Proc. Linn. Soc. N.S. Wales*, Vol. V., p. 95.

“*Tiger Shark*” of Port Jackson Fishermen.

Port Jackson. Length twelve feet.

Genus *GALEUS*, Cuv.

The first dorsal fin opposite to the space between the pectoral and ventral fins, without spine. Caudal fin with a single notch. No pit at the commencement of the caudal fin. A nictitating membrane. Small spiracles. Mouth crescent shaped. Teeth equal in both jaws, oblique, with notch and serrature.

Temperate and Tropical Seas.

1079. *GALEUS AUSTRALIS*, *n. sp.*

The snout is long and depressed, the nostrils being very much nearer to the mouth than to the snout. At the angle of the mouth there is a conspicuous fold, which on the upper jaw is continued a considerable distance, but terminates below close to the angle. Eye with a distinct fold above, the pupil horizontal; spiracle a little behind the eye, a small horizontal slit. The teeth are small and equal in both jaws, strongly notched and strongly serrated on the outer side. The first dorsal fin is about midway between the anterior roots of the pectoral and ventral fins. The second dorsal fin is very small, of the size and shape of the anal, but placed quite half its length in front of it. The caudal fin has a faint trace of a pit above and below at its commencement, and its length is equal to two-thirds of the distance between the first and second dorsals, and is about one-sixth of the total length. A very slight fold extends along each side from the snout to the tail. The upper surface of the snout is marked with numerous pores, and a few are to be traced on the space between the spiracles and the gill-opening; these last are rather small. The foetus differs in having the spiracles larger and rounder and the fins tipped with black. The colour is pale bluish-grey indistinctly mottled with darker on the back.

Port Jackson. Length six feet. Very numerous and extremely prolific.

This Fish has generally been regarded as identical with *Galeus canis*, "*The Tope*" of English fishermen. I think I am justified in separating them. It is the "*School Shark*" of the Port Jackson Fishermen.

#### Genus ZYGÆNA, Cuv.

The first dorsal fin opposite to the space between the pectorals and ventrals, without spine. Caudal fin with a single notch. A pit at the commencement of the caudal fin. Anterior part of the head broad, flattened and laterally elongated. Eyes situated at the extremity of the lateral elongations. A nictitating membrane. No spiracles. Nostrils situated on the front edge of the head. Mouth crescent-shaped. Teeth of both jaws similar, oblique, with notch.

Temperate and Tropical Seas.

#### 1080. ZYGÆNA MALLEUS, Shaw.

Gunth., Cat. Fishes, VIII., p. 381. Synonyms numerous.

"*The Hammer-headed Shark.*"

The length of the hinder margin of one side of the hammer is nearly equal to its width near the eye. Nostril close to the eye, prolonged into a groove running along nearly the entire front margin of the head.

Port Jackson, Port Phillip. Length from four to eight feet.

#### Genus MUSTELUS, Cuv.

The first dorsal fin opposite to the space between the pectorals and ventrals, without spine; the second not much smaller than the first. No pit at the root of the caudal fin, which is without distinct lower lobe. A nictitating membrane. Spiracles small, behind the eyes. Mouth crescent-shaped, with well developed,



long labial folds. Teeth small, numerous, similar in both jaws, arranged like pavement, obtuse, or with very indistinct cusps.

Temperate and Tropical Seas.

1081. *MUSTELUS ANTARCTICUS*, Gunth.

Gunth., Cat. Fishes, VIII., p. 387.—Casteln. Proc. Zool. Soc. Vict., Vol. 1, p. 216.

Snout rather obtuse, not much produced, the length of its præoral portion being somewhat less than the distance between the angles of the mouth. The upper teeth with a rather cutting edge; but without prominent cusp. Origin of the dorsal fin behind the inner posterior angle of the pectoral. Colour uniform grey.

Tasmania, Port Phillip, Port Jackson.

FAMILY II. LAMNIDÆ.

The first dorsal fin opposite to the space between the pectoral and ventral fins, without spine, an anal fin. No nictitating membrane. Mouth crescent-shaped, inferior; nostrils not confluent with the mouth. Gill-openings generally wide. Spiracles none or minute.

Genus *LAMNA*, Cuv.

The first dorsal fin opposite to the space between the pectoral and ventral fins, without spine; the second dorsal and the anal fins very small. A pit at the root of the caudal fin, which has the lower lobe much developed. Side of the tail with a keel. No nictitating membrane. No spiracles. Mouth wide. Teeth large, lanceolate, not serrated, sometimes with additional basal cusps. Gill-openings very wide.

Temperate and Tropical Seas.

1082. *LAMNA GLAUCA*, Mull. & Henle.

*Oxyrhina glauca*, Mull. & Henle, p. 69, pl. 20.

“*The Blue Pointer*” of the Sydney fishermen.

Snout ending in a point, not long, its length from the front of the upper jaw being about equal to the length of the cleft of the mouth. The eyes are situated over the middle of the length of the mouth, and the nostrils are in front of the lower margin of the orbit, and nearer to the orbit than to the point of the snout. The teeth in front of both jaws are long, rather cylindrical, pointed, curved a little backwards and two rooted, those on the sides are shorter, and of more compressed form. Gill-openings very large, about equal. The first dorsal fin is about midway between the vertical from the pectoral and ventral fins; it is triangular, nearly as high as long, and terminating behind its lower extremity in a small pointed lobe. The pectoral fins are rather small, and but slightly falciform, the posterior margin being only slightly emarginate. The second dorsal fin is extremely small, with a pointed lobe behind; in size and form the anal fin is exactly similar, but its commencement is opposite the posterior point of the second dorsal. The caudal fin is rather small, the lower lobe more than half the size and very much of the form of the upper. On each side of the tail, beginning opposite the termination of the anal fin, there is a very prominent sharp edged cutaneous keel, and terminating at the commencement of the caudal fin, its width at its middle being near the one-fourth of its length. The skin is very finely shagreened, almost smooth. The colour of the upper half of the body is blue, of the lower white, the line of demarkation between the two colours being distinctly marked and exactly in the middle of the sides, the keel on the tail being exactly on the line.

Coasts of New South Wales. Length twelve feet.

Genus CARCHARODON, Muller & Henle.

The first dorsal fin opposite to the space between the pectoral and ventral, without spine, the second and the anal very small.

A pit at the root of the caudal, which has the lower lobe well developed. Side of the tail with a keel. No nictitating membrane. Spiracles minute. Sometimes absent. Mouth crescent-shaped, wide. Teeth large, flat, erect, regularly triangular, serrated. Gill-openings wide.

Temperate and Tropical Seas.

1083. *CARCHARODON RONDELETHI*, Mull. & Henle.

Mull. & Henle, p. 70.—Dum., Elasmobr., p. 411.—Gunth., Cat. Fishes VIII., p. 392.

“*The White Pointer*” of Sydney Fishermen.

General appearance of *Lamna glauca*, with the same form of snout and tail, but differs in having the teeth, though as long, much broader and compressed, and serrated. The eye is situated more over the front of the mouth. The first dorsal fin nearer the pectoral fin, which is much longer, but not falciform. The keel on each side of the tail is longer and not so wide, and the lower lobe of the caudal is almost if not quite as long as the upper. Colour pale bluish-grey.

Australian Seas. Port Jackson. Greatest length thirty-six feet.

Genus *ODONTASPIS*, Agass.

The first dorsal fin opposite to the space between the pectoral and ventral fins, without spine; the second dorsal and the anal not much shorter than the first dorsal. No pit at the root of the tail; its side without keel. No nictitating membrane. Spiracles minute, pore-like, above the angle of the mouth. Mouth crescent shaped, wide. Teeth large, awl-like, with one or two small cusps at the base. Gill-openings of moderate width.

Temperate and Tropical Seas.

1084. *ODONTASPIS AMERICANUS*, Mitch.

Gunth., Cat. Fishes, VIII., p. 392.—*O. taurus*, Mull. & Henle, p. 73, pl. 30.

“*The Grey Nurse*” of the Sydney Fishermen.

The first tooth of the upper jaw not smaller than the second. One or two small teeth between the third and fourth long tooth on each side of the upper jaw. Long teeth with a single small cusp on each side of the base. The first dorsal fin very close to the root of the ventral. Length ten feet.

Port Jackson, Tasmania, South Australia.

#### Genus ALOPECIAS, Mull. & Henle.

The first dorsal fin opposite to the space between the pectoral and ventral fins, without spine; the second dorsal and anal very small. Caudal fin of extraordinary length, with a pit at its root. No keel on the side of the tail. No nictitating membrane. Spiracles immediately behind the eye, minute or sometimes absent. Mouth crescent-shaped. Teeth equal in both jaws, of moderate size, flat, triangular, not serrated. Gill-openings of moderate width.

Temperate and Tropical Seas.

#### 1085. ALOPECIAS VULPES, L.

Mull. & Henle, p. 74, pl. 35, fig. 1, teeth.—Gunth., Cat. Fishes, VIII., p. 393

The third tooth on each side of the upper jaw much smaller than the others. Pectoral fins large, falciform. Tail half or more than half the total length.

Port Jackson (Macl. Mus.) Length seven feet.

#### FAMILY III. NOTIDANIDÆ.

Characters of the single genus.

#### Genus NOTIDANUS, Cuv.

One dorsal fin only, without spine, opposite to the anal. No pit at the root of the caudal fin. No nictitating membrane.

Spiracles small, on the side of the neck. No lateral fold. Mouth crescent-shaped. Dentition unequal in the jaws: in the upper jaw one or two pairs of awl-shaped teeth, the following six being broader and provided with several cusps, one of which is much the strongest. Lower jaw with six large comb-like teeth on each side, beside the smaller posterior teeth. Six or seven wide gill-openings.

Temperate and Tropical Seas.

1086. *NOTIDANUS INDICUS*, Cuv.

Macd. & Barr., Proc. Zool. Soc., 1868, p. 371, pl. 33.—Gunth.,  
Cat. Fishes VIII., p. 398.

Snout short and rounded; cleft of the mouth broader than long. A single median pointed tooth in the upper jaw; the lower median tooth with lateral cusps, but without central cusp. The first cusp of the lower teeth is much stronger than the others and serrated on its outer margin.

Jervis Bay, Port Jackson. Length five feet.

FAMILY IV. SCYLLIDÆ.

The first dorsal fin above or behind the ventrals, without spine; an anal fin. No nictitating membrane. Spiracle distinct. Mouth inferior. Teeth small, several series being generally in function.

Genus *SCYLLIUM*, Cuv.

Two dorsal fins without spines; the first above or behind the ventrals; the origin of the anal fin is always in advance of that of the second dorsal. Spiracle behind the eye. Nasal cavity separate from the mouth. Teeth small, with a middle longer cusp and generally one or two small lateral cusps, arranged in numerous series. Eggs similar to those of Rays. Upper edge of the caudal fin not serrated.

Temperate and Tropical Seas.

## 1087. SCYLLIUM MACULATUM, Bl.

Gunth., Cat. Fishes VIII., p. 401.—(Not *maculatum* of Gray, Richardson, Bleeker, Dumeril, Muller and Henle, and Cantor.)

Nasal valves confluent, without cirrus, forming together a broad flap in front of the mouth, with the hinder margin concave. Both jaws with a well developed labial fold, extending from the symphysis of the lower jaw, round the angle of the mouth, to the nasal flap. Teeth of the lower jaw of moderate size, with a long median cusp, and a pair of small cusps on each side. Gill-openings narrow. Skin of the trunk rough. Ventral fins obliquely truncated behind. End of the anal fin below the middle of the dorsal, the length of its base is equal to that of the dorsal and three-fourths of its distance from the caudal. Brownish, above and below, with scattered round brown spots scarcely as large as the eye and distant from one another.

Port Darwin, Port Jackson. Length two feet.

## 1088. SCYLLIUM LATICEPS, Dum.

Dum., Elasmobr., p. 323.—Gunth., Cat. Fishes VIII., p. 404.

The nasal valves are not confluent, are separated from each other by a very broad interspace, and without prominent cirrus. No labial fold. Teeth very small, tri-cuspid. Head very broad and depressed. End of the anal fin nearly opposite to the end of the dorsal; anal a little longer than the dorsal, the length of its base being nearly equal to its distance from the caudal. Brownish marbled with darker.

Tasmania.

## Genus PARASCYLLIUM, Gill.

Two dorsal fins without spines, the first behind the ventrals; origin of the anal fin in advance of the second dorsal. Spiracle minute, below the posterior angle of the orbit. Nasal and buccal cavities confluent. Two nasal valves each with a short

cirrus. Lower lip well developed. Teeth small, lanceolate, only those of the lower jaw with indistinct lateral cusps. The four first gill-openings distant and much narrower than the last, which is approximate to the fourth and very wide.

Australia.

1089. *PARASCYLLIUM VARIOLATUM*, Dum.

Dum. Elasmobr., p. 327.—Gunth., Cat. Fishes VIII., p. 410.

Lower lip not continuous across the symphysis of the lower jaw; mouth midway between the eye and the extremity of the snout. The two dorsal fins sub-equal in size, the first very distant from the root of the ventral; anal nearly entirely in advance of the second dorsal. Dark brown above with more or less distinct black spots.

Tasmania. Length from two to three feet.

1090. *PARASCYLLIUM NUCHALE*, M'Coy.

Ann. & Mag. Nat. Hist. 1874, XIII., p. 15, pl. 2.

Body and fins clouded with two shades of chocolate brown, with a broad blackish brown nuchal collar extending from the base of the pectoral fin to halfway between the eye and the first gill-opening; and two or three very conspicuous large spots of the same dark colour on each of the fins; the whole of the sides and back covered with white spots, smaller and more crowded on the dark nuchal collar; under side of throat and abdomen pale whitish-brown. Mouth nearer to the snout than to the eyes.

Port Phillip. Length two feet nine inches.

Genus *CHILOSCYLLIUM*, Mull. & Henle.

Two dorsal fins without spines; the first above or behind the ventrals. Anal fin placed far behind the second dorsal, and very close to the caudal. Spiracle very distinct, below the eye. Nasal and buccal cavities confluent. Nasal valve folded, with a



cirrus. Lower lip well developed, continuous or interrupted in the middle. Teeth small, triangular, with or without lateral cusps. The two last gill-openings close together.

Indian and Australian Seas.

1091. *CHILOSCYLLIUM OCELLATUM*, L.

Gunth., Cat. Fishes VIII., p. 410.—Muller & Henle, p. 16.—  
Dum. Elasmobr., p. 326.

The lower labial fold is not continued across the symphysis. The first gill-opening narrower than the second, scarcely wider than the orbit. Mouth much nearer to the end of the snout than to the eye. Body with scattered round black spots; a large black white edged ocellus above the pectoral fin.

Cape York, Port Darwin, Torres Straits. Length from two to three feet.

1092. *CHILOSCYLLIUM TRISPECULARE*, Richards.

Voy. Erebus & Terror, p. 43, pl. 28.—Gunth., Cat Fishes VIII.,  
p. 411.

The lower labial fold is not continued across the symphysis. The first gill-opening is as wide as the second and distinctly wider than the orbit. Mouth much nearer to the end of the snout than to the eye. Head and body covered with small brown spots, which on the hinder part of the trunk are arranged in small rings; some indistinct dark bands across the back; a large black white edged ocellus with one or two smaller ocelli behind it, above the pectoral fin.

North-west Australia. (Richardson.) Length twenty-two inches.

1093. *CHILOSCYLLIUM MODESTUM*, Gunth.

Proc. Zool. Soc., 1871, p. 654, pl. 54.

The lower labial fold is not continued across the symphysis. Mouth at the lower surface of the snout, at some distance from



its extremity, but nearer to the latter than to the eye. Dorsal fins sub-equal in size, with the angles not produced, close together, the distance between them being somewhat more than one-half of the length of the base of the first. Origin of the first dorsal above the middle of the base of the ventrals. Uniform brown, darker on the back than on the sides.

Queensland. (Gunth.) Length twenty and a half inches.

1094. *CHILOSCYLLIUM FURVUM*, *n. sp.*

Lower labial fold divided at the symphysis. Nasal cirrus rather long, close to the snout and distant from the mouth. Upper lip more than half as long as wide. Snout rounded and somewhat depressed. The spiracle behind and beneath the eye, very large, nearly round and surrounded by a distinct fold. The eyes are small and oblong. The gills are narrow, the last much wider than the others, but very little closer to the fourth than the preceding one. Pectoral fins rounded behind. The two dorsal fins are of about equal size, very nearly the length of their base apart, and truncate posteriorly. The skin is very finely shagreened and glossy, of a reddish-brown above and on the sides, with indistinct darker cross bars, and scattered small yellowish or whitish spots; beneath the colour is yellowish; there is a distinct fold along each side of the back to the tail.

Port Jackson. Length from two to three feet.

Genus *CROSSORHINUS*, Muller & Henle.

Two dorsal fins, without spines,—the first behind the ventrals, the second in advance of the anal, which is very close to the caudal. Tail rather short. Eye small. Spiracle in a wide oblique slit, behind and below the eye. Nasal and buccal cavities confluent. Head broad, flat, with the snout very obtuse; mouth wide, nearly anterior. A free nasal cirrus; sides of the head with skinny appendages. Upper and lower lips well developed. Anterior teeth rather large, long, and slender,

without lateral lobes; the lateral teeth tricuspid, smaller, forming a few series only. The fourth and fifth gill-openings close together.

Australia, Japan.

1095. *CROSSORHINUS BARBATUS*, L.

Muller & Henle, p. 21, pl. 5.—Gunth., Cat. Fishes, VIII., p. 414.

About seven skinny simple or partly bifid lobes on each side of the head, five of which are near the angle of the mouth. Very minute barbels across the chin are sometimes absent. Distance between the two dorsal fins equal to the length of the base of the first. Upper parts brown, marbled with grey; a whitish spot behind the spiracle.

Port Jackson, (the "*Wobbigong* of the natives,) Tasmania, South Australia, &c. Length five to seven feet.

1096. *CROSSORHINUS TENTACULATUS*, Peters.

Gunth., Cat. Fishes VIII., p. 414.

A single flat tentacle at the angle of the mouth, another on the side of the throat. Chin without barbels. Distance between the two dorsal fins much less than the length of the base of either. Back with very broad brown cross-bands, the posterior encircling the tail entirely. A white spot behind the spiracle.

Cape York.

FAMILY V. *CESTRACIONTIDÆ*.

Characters of the single genus.

Genus *HETERODONTUS*, Blainv.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 309.

The Pacific Ocean.

1097. *HETERODONTUS PHILLIPPI*, Lacep.

Proc. Linn. Soc., N.S. Wales, Vol. III., p. 309-313, pl. 22, 23, 24.

Port Jackson, Port Phillip.

1098. *HETERODONTUS GALEATUS*, Gunth.

Proc. Linn. Soc., N.S. Wales, Vol. III., p. 313, pl. 25.

Port Jackson.

## FAMILY VI. SPINACIDÆ.

Two dorsal fins; no anal fin. Mouth but slightly arched; a long, deep, straight, oblique groove on each side of the mouth. Spiracles present; gill-openings narrow. Pectoral fins not notched at their origin.

Genus *ACANTHIAS*, Muller & Henle.

Two dorsal fins, each with a spine; no anal fin. Mouth but slightly arched; a long, deep, straight, oblique groove on each side of the mouth; no labial fold along the margin of the mouth. Teeth equal in both jaws, rather small, their point so much turned aside that the inner margin of the tooth forms the cutting edge. No nictitating membrane. Spiracle rather wide, immediately behind the eye. Gill-openings narrow.

Temperate Seas.

1099. *ACANTHIAS VULGARIS*, Risso.

Mull. & Henle, p. 83.—Dum., *Elasmoobr.*, p. 437.—Gunth., *Cat.*

*Fishes VIII.*, p. 418.

Origin of the dorsal fin opposite to or behind the inner posterior angle of the pectoral. Dorsal spines without groove. Snout produced. Colour bluish-grey, with white spots in young specimens.

New Holland (Gunther).

## 1100. ACANTHIAS BLAINVILLEI, Risso.

Mull. & Henle, p. 84.—Dum., *Elaémobr.*, p. 438.—Gunth., *Cat. Fishes VIII.*, p. 419.

Resembling *A. vulgaris*, but with the first dorsal fin conspicuously in advance of the inner posterior angle of the pectoral.

New Holland (Gunther).

1101. ACANTHIAS MEGALOPS, *n. sp.*

Head flat; snout long, tapering and rounded in front, the distance from the mouth to the snout about equal to the width of the mouth, which is moderately crescent-formed and has a straight oblique groove at the angle. The nostrils are near the snout, and twice the distance from the mouth. The orbital cavity is of great length, about equal to its distance from the point of the snout, and its height is less than half its length; close to and above the posterior corner of the eye is a rather large oblique spiracle. The first dorsal fin is placed in advance of the vertical from the posterior angle of the pectoral; the ventrals are placed opposite the middle of the space between the two dorsals. A very conspicuous keel runs along each side of the tail immediately below the median lateral line. Colour uniform greyish-brown.

Port Jackson. Length two feet.

## Genus ISISTIUS, Gill.

Two very small dorsal fins, without spine, the first nearly opposite to the ventrals; no anal fin. Skin uniformly granular. Mouth transverse; a deep straight groove at each angle of the mouth, the fold which covers it runs round the whole margin of the upper jaw; an upper and lower free lip besides. Nostrils nearly in front of the snout. Upper teeth small, narrow, lanceolate, the lower much larger, triangular, nearly erect, with

smooth edges. No nictitating membrane. Spiracles wide, on the side of the neck. Gill-openings, very narrow, in a groove.

Tropical Seas.

1102. *ISISTIUS BRAZILIENSIS*, Quoy & Gaim.

Mull. Henle, p. 92.—Dum., *Elasmobr.*, p. 453.—Gunth., *Cat. Fishes VIII.*, p. 429.

*Leius ferox*, Kner, *Denkschr.*, Ak. Wiss. Wien., pl. 4. fig. 2.

Twenty-five teeth in the lower jaw. Scales minute, granular. The first dorsal fin immediately in front of the ventrals. Sometimes a broad dark band across the chest.

Australia (Kner).

FAMILY VII. RHINIDÆ.

Characters of the single genus.

Genus *RHINA*, Klein.

Body depressed, flat. Mouth anterior. Pectoral fins large, expanded in the plane of the body, with the basal portion prolonged forwards, but not grown to the head. Gill-openings rather wide, lateral, partly covered by the base of the pectoral. Spiracles wide, behind the eyes. Nostrils with skinny flaps, on the margin of the snout. Teeth conical, pointed, distant. Dorsal fins on the tail, without spines; no anal fin. Males with small prehensile appendages.

Temperate and Tropical Seas.

1103. *RHINA SQUATINA*, L.

Gunth., *Cat. Fishes VIII.*, p. 430. (Many synonyms).

“*The Angel Shark*” of Fishermen.

This is the only species of the genus. It nearly approaches the Rays. The colour is uniform dark brown. Length from two to four feet.

Coasts of Australia, Port Jackson.

## FAMILY VIII.—PRISTIOPHORIDÆ.

The rostral cartilage is produced into an exceedingly long flat lamina, armed along each edge with a series of teeth like a saw.

## Genus PRISTIOPHORUS, Mull. &amp; Henle.

Body rather depressed and elongate. Pectoral fins with the front margin quite free, distant from the head. Gill-openings lateral, in front of the pectoral fin, of moderate width. Spiracles wide, behind the eye. No nictitating membrane. Nostrils inferior; a pair of long tentacles at the lower side of the rostral lamina. Teeth small, with a conical cusp on a broad base, arranged in several series. Dorsal fins without spine, the first in front of the ventrals; no anal fin. Upper caudal lobe broader than the lower.

Japan and Australia.

## 1104. PRISTIOPHORUS CIRRATUS, Latham.

Mull. & Henle, p. 98.—Lath. Trans. Linn. Soc., 1794, pl. 26, figs. 5 & 27.

Gunth., Cat. Fishes VIII., p. 432.

Teeth of the saw very unequal in length, there being from one to two smaller ones between the larger. Scales extremely minute, with a single keel, their point not projecting. Dorsal and pectoral fins entirely covered with scales. The distance between the tentacle and nostril equals that between the nostril and the third or fourth gill-opening. Forty-two sets of teeth in the upper jaw.

Tasmania, South Australia, Port Jackson.

## 1105. PRISTIOPHORUS NUDIPINNIS, Gunth.

Gunth., Cat. Fishes VIII., p. 432.

Teeth of the saw very unequal in length. Scales minute, nearly smooth, with traces of two or three keels at the base. The greater portion of the dorsal fins and of the upper side of the pectorals, naked. The distance between the tentacle and the nostril is considerably less than that between the nostril and the first gill-opening. From thirty-five to thirty-nine sets of teeth in the upper jaw.

Tasmania, South Australia.

#### SUB-ORDER II. *BATOIDEI*.

*Gill-openings ventral. Body depressed. Tail generally long. Spiracles always present. Five pairs of gill-openings. No anal fin. Dorsal fin, if present, on the tail.—Rays.*

#### FAMILY I. *PRISTIDÆ*.

The snout is produced into an exceedingly flat lamina, armed with a series of strong teeth along each edge.

#### Genus *PRISTIS*, Latham.

Body depressed and elongate. Pectoral fins with the front margin quite free, not extending to the head. Gill-openings inferior, inwards of the base of the pectoral fin, of moderate width. Spiracles wide, behind the eye. No nictitating membrane. Nostrils inferior; no tentacles. Teeth minute, obtuse. Dorsal fins without spine, the first opposite or close to the base of the ventrals.

Tropical and Sub-tropical Seas.

1106. *PRISTIS ZYSSON*, Bleek.

Gunth., Cat. Fishes VIII., p. 438.

Origin of the dorsal fin above the middle of the root of the ventrals. From twenty-six to thirty-two pairs of rostral teeth; the anterior placed close together, the distance between them not being more than twice the base of a tooth. The three hindmost

teeth are thrice as remote from one another as the anterior. The second dorsal fin is not smaller than the first, and its posterior lobe extends nearly to the root of the caudal. No lower caudal lobe.

Moreton Bay. One specimen over sixteen feet in length.

## FAMILY II. RHINOBATIDÆ.

Tail strong and long, with two well developed dorsal fins; a caudal and a longitudinal fold on each side. Disk not exceedingly dilated, the rayed portion of the pectoral fin not being continued to the snout. No electric organ.

### Genus RHINOBATUS, Mull. & Henle.

Body depressed, gradually passing into the tail. Cranial cartilage produced into a long rostral process, the space between the process and pectoral fin being filled by a membrane. Spiracles wide, behind the eye. Nostrils oblique, wide; anterior nasal valves not confluent. Teeth obtuse with an indistinct transverse ridge. Dorsal fins without spine, both at a great distance behind the ventral fins. Caudal fin without lower lobe.

Tropical and Sub-tropical Seas.

### 1107. RHINOBATUS GRANULATUS, Cuv.

Mull. & Henle, p. 117, pl. 38.—Dum. Elasmobr., p. 493.—Gunth., Cat. VIII., p. 443.

Anterior nasal valve not dilated laterally. Snout produced, the distance between the outer angles of the nostrils being contained about once and two-thirds in that between the mouth and the end of the snout. Mouth straight. Back covered with very distinct rough tubercles, and with a series of large compressed spines along the median line. Some distinct spinous tubercles on the orbital margin and on the shoulder. The two rostral ridges are narrow, and united nearly from the base. Colour greyish with a few faint distant whitish spots.

Port Jackson, Cape York.



## 1108. RHINOBATUS BANKSII, Mull. &amp; Henle.

Mull. & Henle, p. 123 & 192.—Dum. Elasmobr., p. 490.—Gunth.,  
Cat. VIII., p. 446.

The anterior nasal valve is continued towards the median line by a short fold, which, however, is far from reaching those of the other side. The distance between the inner angles of the nostrils is more than the length of a nostril. Snout produced. Mouth arched; the median tooth of the lower jaw larger and more prominent than the lateral. A series of small tubercles along the middle of the back, and two short rows on each shoulder.

Australia (Gunther).

## 1109. RHINOBATUS THOUINI, Mull. &amp; Henle.

Mull. & Henle, p. 120.—Dum. Elasmobr., p. 500, pl. 10.—  
Gunth., Cat. Fishes VIII., p. 442.

Anterior nasal valve not dilated laterally. Nostril very long, its length being more than the space between the inner angles of the nostrils. Snout terminating in a long narrow cartilaginous appendage. Mouth straight. Skin coarsely granular. A series of compressed spines along the median line of the back; similar spines on the orbital margin and shoulder. Rostral ridges confluent, narrow. Colour entirely light chamois-grey.

West Australia (Castelnau).

## 1110. RHINOBATUS DUMERILII, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 148.

Snout very obtuse, rounded, broad, with semicircular outline. The distance to the outer angles of the nostrils is three-fourths of that between the mouth and the end of the snout; no spines on the eyes or shoulders; a median line of strong, compressed, arched spines, placed far apart. The rostral ridges are arched inwardly, and on their anterior part are only separated by a

narrow groove. The dorsal fins are equal to the length of the interocular space; the dorsal tubercles between the fins are feeble; they are not visible at all behind the second dorsal. The upper surface is rough and covered with small tubercles. The colour is light brown above, yellowish-white beneath.

West Australia. Length fourteen inches.

Genus TRYGNORHINA, Mull. & Henle.

Differs from *Rhinobatus* only in having the anterior nasal valves broad, and confluent into a broad, quadrangular flap with a free margin overhanging the mouth.

Australia.

1111. TRYGNORHINA FASCIATA, Mull. & Henle.

Mull. & Henle, p. 124, pl. 43.—Dum. Elasmobr., p. 502.—  
Gunth., Cat. Fishes VIII., p. 400.

“*The Fiddler*” of the Sydney Fishermen.

Snout rather short, the distance between its extremity and the mouth being not much more than the distance between the outer angles of the nostrils. A series of obtuse distant tubercles along the median line of the back; some similar tubercles above the eye and on the shoulder. Colour pale reddish-brown, with numerous wavy irregular light coloured fasciæ, edged with dark brown.

Tasmania, Victoria, South Australia, New South Wales.

FAMILY III. TORPEDINIDÆ.

The trunk is a broad smooth disk; tail with rayed dorsal and caudal fins and a longitudinal fold along each side. Anterior nasal valves confluent into a quadrangular lobe. An electric organ composed of vertical hexagonal tubes between the pectoral fins and the head.

## Genus NARCINE, Henle.

Tail distinct from and longer than the sub-circular disk, with a fold on each side. Body entirely naked. Two dorsal fins on the tail, without spine; caudal fin well developed; ventral fins separate. Nasal valves confluent into a quadrangular valve. Teeth almost flat, sometimes with a median point, which however does not project. Spiracles immediately behind the eye. An electric apparatus between the head and the pectoral fins.

Tropical and Sub-tropical Seas.

## 1112. NARCINE TASMANIENSIS, Richards.

Trans. Zool. Soc. III., p. 178, pl. 11, fig. 2.—Gunth., Cat. Fishes VIII., p. 452.

Outline of the disk elliptical. Spiracle close behind the eye, without tubercles on the margin. The first dorsal fin not larger than the second. Hind-margin of the caudal fin obliquely rounded, passing into the lower margin. Colour brownish.

Tasmania. Length up to six feet.

## Genus HYPNOS, Dum.

Tail extremely small and short like an appendage. Body entirely naked. Two dorsal fins on the tail, without spine, caudal fin well developed. Nostrils round, open, without valves. Teeth tri-cuspid, with very slender points. Spiracle immediately behind the eye. An electric apparatus on each side of the head.

Australia.

## 1113. HYPNOS SUBNIGRUM, Dum.

Rev. Zool. 1852, p. 279, pl. 12.—Gunth., Cat. Fishes, VIII., p. 453.

Eyes minute; spiracles fringed. Upper parts black, with or without white spots.

Port Jackson, West Australia.

## FAMILY IV. RAJIDÆ.

Disk broad, rhombic, generally with asperities or spines; tail with a longitudinal fold on each side. The pectoral fins extend to the snout. No electric organ. No serrated caudal spine.

## Genus RAJA, Cuv.

Tail very distinct from the disk, which is of a rhombic shape, with a fold on each side. Body generally rough or with spines, rarely entirely smooth. Two dorsal fins on the tail, without spine. Tail with a rudimentary caudal fin or without fin. Each ventral fin divided into two by a deep notch. Nasal valves separated in the middle, where they are without a free margin. Teeth obtuse or pointed. Pectoral fins not extending forward to the extremity of the snout. Sexes differing in the form of the teeth and in the dermal spines.

All Seas.

## 1114. RAJA LAMPRIERI, Richards.

Voy. Erebus and Terror, p. 43, pl. 23.—Gunth., Cat. Fishes VIII., p. 463.

“*Thorn Back*” of the Melbourne fishermen.

Snout short and somewhat obtuse. The space between the eyes is equal to the diameter of the eye. Teeth pointed. Outer angle of pectoral fin rounded. The width of the body equals the distance from the snout to the posterior base of the ventrals. Spines on the superciliary edge, on the mesial line between the head and the humeral cartilage, and a row beginning at the pelvis runs down the middle of the tail, directed alternately to right and left. There are also a few scattered spines, but these like all the other spines vary considerably in size. Colour greyish-brown, tip of the snout black.

Tasmania, Port Phillip.

## 1115. RAJA ROSTRATA, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 57.

The snout long; body entirely covered with asperities, which are more considerable on the snout, where they form small triangular points; on the lower surface of this part of the edges, up to the height of the eyes these points are considerable and crowded. Anterior profile deeply concave; the angle of the pectorals is rather pointed; there are no spines round the eyes, but a series of three or four is seen on each side of the back and ends before the insertion of the ventrals; the tail is armed with three series of strong tubular spines, and one or two are seen on the middle of the back behind the head. Colour greyish-purple with the sides reddish; body generally covered with white spots.

Port Phillip. (Attains the weight of 60 lbs.)

Count Castelnau gave a description of this Fish in the Proc. Zool. Soc. Vict. Vol. I., p. 224, under the name of *B. oxyrhynchus*, Lin., and subsequently in the 2nd Volume points out his mistake.

## FAMILY V. TRYGONIDÆ.

The pectoral fins are uninterruptedly continued to and confluent at the extremity of the snout. Tail long and slender, without lateral longitudinal folds; vertical fins none, or imperfectly developed, often replaced by a strong serrated spine.

## Genus UROGYMNUM, Mull. &amp; Henle.

Tail long, very distinct from the sub-circular or elliptic disk, without fin or spine, sometimes with a narrow cutaneous fold below. Body densely covered with osseous tubercles. Pectoral fins united in front.

Indian and Australian Seas.

## 1116. UROGYMNUM ASPERRIMUM, Bl.

Dumeril. Elasmobr., p. 580.—Gunth., Cat. Fishes, VIII., p. 472.

The dorsal surface of the head and trunk and the tail are densely covered with osseous tubercles, between which larger erect conical thorns are scattered; the pectoral fins without the small tubercles, but with numerous large thorns each standing on a circular base.

Cape York. (Chevert Exp.)

Genus TRYGON, Mull. & Henle.

Tail tapering, without any fin or with cutaneous folds not extending to its extremity, armed with a long arrow-shaped spine, serrated on each side. Body smooth or with tubercles. Pectoral fins united in front. Nasal valves coalescent into a quadrangular flap. Teeth flattened.

Temperate and Tropical Seas.

1117. TRYGON UARNAK, Forsk.

Mull. & Henle, p. 158.—Dum. Elasm., p. 585.—Gunth., Cat. Fishes VIII., p. 473.

Tail without cutaneous fold, exceedingly long and slender, about thrice as long as the disk. Snout rather pointed, forming a distinct projection in the anterior profile, the margins meeting at an angle which is fully or less than a right angle. One or more large tubercles in the middle of the back; young examples are smooth, but with progressing age the entire dorsal surface becomes covered with small tubercles. No large tubercles in the median line of the tail. Disk about as broad as long. Uniform brown, or with numerous dark brown spots; tail of young specimens with brown and white rings.

Port Darwin.

1118. TRYGON PASTINACA, Linn.

Mull. & Henle, p. 161.—Dum. Elasm., p. 600.—Gunth., Cat. Fishes, VIII., p. 478.

“*The Sting Ray.*”

Tail with a distinct cutaneous fold below, and a slight ridge above, about one-half longer than the disk or less. The margins of the snout form an obtuse angle. Body smooth, sometimes a few small tubercles pointing backwards, in the median line of the scapulary region. Three appendages at the bottom of the mouth, behind the teeth. Coloration uniform, or sometimes with small round, scattered whitish, non-ocellated spots.

Port Darwin, Port Jackson.

1119. TRYGON TUBERCULATA, Lacep.

Dumeril. Elasmobr., p. 605.—Gunth., Cat. Fishes VIII., p. 480.

Tail with a distinct fold below, a very low upper fold being as frequently absent as present. The tail is more than twice the length of the disk. Snout pointed and rather produced. A series of spinous tubercles, each pointing backwards at the tip, runs from the scapulary region to the caudal spine; older individuals having the back of the head and trunk more or less covered with small tubercles. Minute tubercles on the tail. Three papillæ at the bottom of the mouth behind the teeth. Dental laminæ much undulated. Coloration uniform, almost black. Length of disk two feet.

Port Jackson.

Genus UROLOPHUS, Mull. & Henle.

Tail of moderate length with a distinct rayed terminal fin, armed with a serrated spine, without or with a rudimentary dorsal fin. Pectoral fins united in front. Mouth and teeth as in *Trygon*.

Australia and West Indies.

1120. UROLOPHUS CRUCIATUS, Lacep.

Dumeril, Elasmobr., p. 626.—Gunth., Cat. Fishes, VIII., p. 485.

*Urolophus ephippiatus*, Richards., Voy. Ereb. and Terr., 35, pl. 24.

Disk rather broader than long, the anterior margins being straight and meeting at an obtuse angle; snout not projecting. Skin entirely smooth. Tail shorter than the disk. Yellowish, uniform or with one or three blackish longitudinal bands, crossed by others of the same colour.

Port Arthur.

1121. *UROLOPHUS TESTACEUS*, Mull. & Henle.

Mull. & Henle, p. 174, pl. 56.—Gunth., Cat. Fishes, VIII., p. 486.

Syn. *U. Mulleri*, *Henlei*, and *australis*, of Steindachner.

Disk rather broader than long, the anterior margins meeting at a very obtuse angle; snout not projecting. Skin entirely smooth. Tail shorter than the disk in adults, rather longer in young specimens. Nasal valve fringed; six short papillæ at the bottom of the mouth. Coloration uniform.

Cape Upstart, Port Jackson.

#### FAMILY VI. MYLIOBATIDÆ.

The disk is very broad in consequence of the great development of the pectoral fins, which, however, leave the sides of the head free, and re-appear at the extremity of the snout as a pair of detached (cephalic) fins.

#### Genus MYLIOBATIS, Cuv.

Head free from the disk; snout with a soft appendage in front, supported inferiorly by fin-rays. Nasal valves coalescent into a quadrangular flap. Teeth hexangular, large, flat, tessellated; those in the middle much broader than long; several narrower series on each side. Tail very long and thin, with a dorsal fin near its root; generally a serrated spine behind the fin.

Temperate and Tropical Seas.



## 1122. MYLIOBATIS AQUILA, L.

Mull. & Henle, p. 176.—Dum., Elasm., p. 634.—Gunth., Cat. Fishes, VIII., p. 489.

Body entirely smooth. The skinny prolongation of the snout is obtuse, and but moderately produced. Median teeth of the upper jaw from four to six times as broad as long. The insertion of the dorsal fin is behind or opposite the extremity of the ventral fins. Orbit with scarcely a trace of a projection above. Coloration uniform.

Port Jackson (Gunther).

## 1123. MYLIOBATIS NIENHOFFII, Cuv.

Mull. & Henle, p. 177.—Dum., Elasm., p. 638.—Gunth., Cat. Fishes, VIII., p. 491.

Body smooth. The fleshy protuberance at the snout very short and obtuse. Disk twice as broad as long. The origin of the dorsal fin nearly opposite to the end of the root of the ventrals. Orbit without horn. Young individuals with five blue cross-bands. No spots.

Port Phillip (Castelnau).

1124. MYLIOBATIS AUSTRALIS, *n. sp.*

Body smooth. No fleshy protuberance on the snout. The disk from end to end of pectoral fins rather less than twice the length from the extremity of the snout, to the end of the base of the ventrals. The dorsal fin inserted a little in front of the caudal spine, and behind the end of the ventral. Colour yellowish or yellowish-brown, with large blue blotches irregularly distributed over the dorsal surface.

Port Jackson.

GENUS *AETOBATIS*, Mull. & Henle.

Form of the head, body and tail as in *Myliobatis*. The nasal flaps remain separate, each forming a long flap. The lower dental lamina projects beyond the upper. Teeth flat, broad, forming a single series, equivalent to the median series of *Myliobatis*, there being no small lateral teeth.

Tropical Seas.

1125. *AETOBATIS NARINARI*, Cuv.

Mull. & Henle, p. 179.—Dum., *Elaém.* p. 641.—Gunth., *Cat. Fishes VIII.*, p. 492.

Body smooth. Dorsal fin situated between the ventrals. Disk generally with numerous round bluish white spots. The teeth of the lower jaw are sometimes angularly bent, sometimes nearly straight.

Cape York.

GENUS *CERATOPTERA*, Mull. & Henle.

Head free from the pectoral fin, truncated in front, on each side with a horn-like appendage pointing forward or inward, which is a cephalic portion of the pectoral fin. Mouth anterior, wide. Teeth in the lower jaw only, very small. Tail very slender, with a dorsal fin between the ventrals and without spine.

Tropical and Temperate Seas.

1126. *CERATOPTERA ALFREDI*, Krefft.

This is the name affixed to a stuffed specimen of this genus of enormous size, in the Australian Museum. It was captured at Manly Beach in 1868, and was considered by Mr. Krefft a new and undescribed species, but unfortunately he never described it, and description is now impossible, so much painting and puttying and clipping have been practised in setting up the specimen.

SUB-CLASS III. *CYCLOSTOMATA*.

*Skeleton cartilaginous and notochordal, without ribs and without real jaws. Skull not separate from the vertebral column. No limbs. Gills in the form of fixed sacs without branchial arches, six or seven in number on each side. One nasal aperture only. Heart without bulbous arteriosus. Mouth anterior, surrounded by a circular or sub-circular lip, suctorial. Alimentary canal straight, simple, without cæcal appendages, pancreas, or spleen. Generative outlet peritoneal. Vertical fins rayed.*

## FAMILY PETROMYZONTIDÆ.

Body eel shaped, naked. Subject to a metamorphosis. In the perfect stage with a suctorial mouth armed with teeth simple or multicuspid, horny, sitting on a soft papilla. Maxillary, mandibular, lingual, and suctorial teeth may be distinguished. Eyes present (in mature animals). External nasal aperture in the middle of the upper side of the head. The nasal duct terminates without perforating the palate. Seven branchial sacs and apertures on each side behind the head. The inner branchial ducts terminate in a separate common tube. Intestine with a spiral valve. Eggs small. The larvæ without teeth and with a single continuous vertical fin. "Lampreys."

Genus *MORDACIA*, Gray.

Dorsal fins two, the posterior continuous with the caudal. The maxillary dentition consists of two triangular groups, each with three conical acute cusps; two pairs of serrated lingual teeth.

Chili and Australia.

1127. *MORDACIA MORDAX*, Richards.

Voy. Erebus and Terror, pl. 28.—Gunth., Cat. Fishes VIII., p. 507.

Mandibulary lamina crescent-shaped, with about nine acute conical cusps, three of which are larger than the others. Suctorial teeth in somewhat distant series, radiating from the centre; the teeth of the series between the mandible and the posterior lip being as numerous as those of the other series, but rather more confluent. The anterior labial teeth converge and are confluent behind; each tooth of the posterior pair is like one-half of an elongate oval. Suctorial disk elliptic, with a free lip behind. The first dorsal at a considerable distance from the second. Body immaculate.

Tasmania, Port Phillip.

Genus NEOMORDACIA, Casteln.

Differs from *Mordacia* in having only one dorsal fin, separate and rather distant from the caudal fin.

Australia.

1128. NEOMORDACIA HOWITTI, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 232.

“Height of body about nineteen times in the total length; the length of the snout, up to the external edge of the eye, a little longer than the height of the body. The head is not inflated, and follows on to the snout by an arched line, and on the body by a straight one; the dentition is very difficult to be distinctly seen with the weak magnifying power I possess, but I observe a row of strong conical and pointed teeth placed round the mouth and wide apart; a few teeth on each side larger than the others and inserted forwards; there are a few others further back, and a few are tri-cuspid. There are a few fringes round the mouth; the branchiostegal apertures are seven, they are round and begin at a short distance from the eye, which is large. The first half of the body and the head are like reticulated, and covered with irregular excavations; the middle

of the body is smooth, but the posterior portion is again similar to the anterior. It is of a dark blue on the upper parts and silvery below; the caudal fin is red and the eye yellow; the muzzle black." (Castelnau).

Cape Schank. Length three inches.

Genus *GEOTRIA*, Gray.

Dorsal fins two, the posterior separate from the caudal fin. Maxillary lamina with four sharp flat lobes; a pair of long pointed lingual teeth (like the horns of a young Antelope).

Chili and Australia.

1129. *GEOTRIA AUSTRALIS*, Gray.

Proc. Zool. Soc., 1851, p. 238.—Gunth., Cat. Fishes VIII., p. 508.

Skin on the throat very lax, forming a large pouch. The maxillary lamina is thin, crescent-shaped, with four sharp teeth, the middle pair of which are only half as broad as the outer. Mandibular lamina very low, slightly sinuous. Suctorial teeth in numerous series, rather distant from one another, unicuspid; only those nearest to the mouth somewhat larger, the others small. Only one transverse series of very small teeth between the mandibular lamina and the posterior lip, which is beset with numerous broad leaf-like fringes, as in the remainder of the margins of the disk. Suctorial disk sub-triangular, with the lateral lobes very broad. First and second dorsal fins rather widely separated. Coloration uniform.

South Australia. Length twenty inches.

1130. *GEOTRIA CHILENSIS*, Gray.

Gunth., Cat. Fishes, VIII., p. 509.

Skin on the throat not dilated. The outer lobes of the maxillary dental lamina are broad with a sharp convex edge, the inner narrow and pointed. Mandibular lamina crescent-shaped with

numerous obtuse points. Suctorial teeth in numerous series, so close together that the teeth have the appearance of imbricate scales. A series of larger, broad, scale-like teeth round the mandibulary lamina. Suctorial disk not dilated, circular. First and second dorsal fins widely separate. Side and abdomen silvery; back greenish.

Swan River. Length twenty-one inches.

1131. *GEOTRIA ALLPORTI*, Gunth.

Proc. Zool. Soc., 1871, p. 675, pl. 70.

Entirely black; skin with numerous transverse folds. Gular pouch large. The two middle teeth of the maxillary lamina are small, pointed, many times smaller than and entirely disconnected from the lateral, which are of a triangular shape and finely serrated on the inner margin. Mandibulary lamina very low, denticulated. Suctorial teeth in numerous series, rather distant from one another, unicuspid; only those nearest to the mouth somewhat larger, the others small. Form of the suctorial disk as in *G. australis*. Distance between the two dorsal fins, less than the length of the first. Length thirteen inches.

Tasmania (fresh water).

A curious Fish, probably an *Ammocetes*—the name given to the larval form of Fishes of this family—has been described by Count Castelnau from the Yarra River, Melbourne. I quote the Count's description in full.

1132. *YARRA SINGULARIS*, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 231.

“The body is eel-shaped, naked, cylindrical, and elongate, being twenty-three times as long as high. It is entirely divided into annular rings, which appearance seems to be due to the muscular flakes being very visible through the smooth skin. I can see no teeth, the upper lip is flat, and considerably prolonged

over the buccal aperture; it is truncated in front, and this part seen upperly, is rather bi-furcated. The lateral line is well marked in all the length of the body; there is only one dorsal, which begins at about two-thirds of the length of the body, and is joined with the caudal and anal fins; the latter is considerably shorter than the dorsal. No eye visible. The skin of the throat is rather extensible; the prolongation of the upper lip over the lower is equal to the height of the body. The tail is pointed. The colour is of a light green with the belly white, on the back extends a narrow longitudinal line; the head and throat are pink, and the fins of the same colour."

Yarra River (brackish water). Length four and three-eighth inches.

#### SUB-CLASS IV. *LEPTOCARDII*.

*Skeleton membrano-cartilaginous and notochordal, ribless. No brain. Pulsating sinuses in place of the heart. Blood colourless. Respiratory cavity confluent with the abdominal cavity; branchial clefts in great number, the water being expelled by an opening in front of the vent. Jaws none.*

#### FAMILY CIRROSTOMI, Owen.

Characters of the single genus.

#### Genus *BRANCHIOSTOMA*, Costa.

Body elongate, compressed, scaleless, limbless. Mouth a longitudinal fissure, with sub-rigid cirri on each side, inferior. Vent at a short distance from the extremity of the tail. A low rayless fin-like fold runs along the back, round the tail, past the vent to the respiratory aperture. Eye rudimentary. Liver reduced to a blind sac of the simple intestine.

Coasts of temperate regions, imbedded in sand.

## 1133. BRANCHIOSTOMA LANCEOLATUM, Pall.

Gunth., Cat. Fishes VIII., p. 513.—(Many synonyms.)

“*The Amphioxus*” and “*The Lancelet*.”

Transparent, slightly iridescent.

Dredged in Bass' Straits (H.M.S. Herald) and since in many parts of the coasts of New South Wales and Queensland. Length three inches.

## ON MENKE'S AUSTRALIAN SHELLS.

BY RALPH TATE, ASSOC. LINN. SOC., F.G.S.; COR. MEM. ACAD.  
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## INTRODUCTORY CITATION.

“Menke's “*Molluscorum Novaë Hollandiæ*” is a very rare work; I have never seen but two copies in Australia. There are none in any of our public libraries.\* It would be a very small expense; but a great boon, to reprint it.”—Rev. J. E. Tenison-Woods, Roy. Soc. N.S.W., Sept. 1878.

And again “How difficult it would be to obtain Menke's Latin pamphlet on the Mollusea of New Holland.”—The same, Proc. Linn. Soc. N.S.W., Vol. IV., p. 479, 1880.

The above quoted work, which was published in 1843, is an octavo of forty-six pages; it contains a catalogue of two hundred and sixty-three species of Australian, land, fresh-water, and marine shells, the major part of which was collected in Western Australia by Dr. J. A. L. Preiss, during the years 1838 to 1842.

\* A copy has since been added to the Library of the University of Adelaide, and the Library of the Linnean Society. Mr. Brazier of Sydney has had a copy in his Library many years.