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THE FISHES of New South Wales.

By
Allan R. McCulloch

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CHECK LIST

OF

THE FISHES

AND FISH-LIKE ANIMALS

OF

NEW SOUTH WALES

BY

ALLAN R. McCULLOCH

Zoologist, Australian Museum

(By Permission of the Trustees of the Australian Museum)

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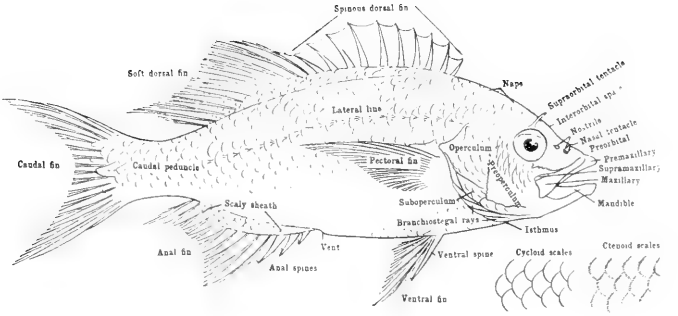

GLOSSARY OF TECHNICAL TERMS.

Abdomen. Belly.
Abdominal. Pertaining to the belly.
Actinosts. A series of bones at the bases of the pectoral rays.
Acuminate. Tapering gradually to a point.
Acute. Sharp-pointed.
Adipose. Fleshy or fatty. Applied to small rayless fins, and to eyelids.
Adpressed. Pressed against the body.
Airbladder. A sac filled with gas, lying beneath the backbone.
Anal. Pertaining to the anus or the Anal fin.
Anal Fin. The fin on the median line behind the vent.
Ankylosed. Grown firmly together.
Anterior. Relating to the front portion.
Antrorse. Turned forward.
Anus. The external opening of the intestine; the vent.
Approximate. Placed close together.
Asperity. Roughness of surface.
Asymmetrical. Without symmetry.
Axillary. Pertaining to the axilla or upper angle of the pectoral fin.

Barbel. An elongated fleshy projection, usually about the head.
Basal. Pertaining to the base; at or near the base.
Bicuspid. Having two cusps or points.
Bifid. Cleft in two.
Bifurcate. Forked.
Branchiae. Gills; respiratory organs of fishes.
Branchial. Pertaining to the gills.

Branchiostegals. Bony rays supporting the gill-membranes behind the lower jaw.
Bristle. A stiff hair-like projection.
Buckler. A bony shield.

Canines. Conical teeth which are longer than the others.
Carapace. A horny or bony covering encasing the body.
Cardiform. Coarse and sharp like wool cards.
Carinate. Keeled; having a ridge along the middle line.
Cartilage, Cartilaginous. Gristle, gristly.
Caudal. Pertaining to the tail.
Ciliated. Fringed with eyelash-like projections.
Cirri. Fringes.
Coalesced. Grown together.
Compressed. Flattened laterally.
Confluent. Joined together.
Conical. Cone shaped; with a cylindrical base and pointed tip.
Corselet. A scaly covering behind the pectorals of some fishes.
Cranium, Cranial. The skull, pertaining to the skull.
Crenulate. Having the edge slightly scolloped.
Cutaneous. Pertaining to the skin.
Ctenoid. Rough-edged.
Cycloid. Smooth-edged.

Deciduous. Temporary; falling off.
Dendritic. Resembling a tree or shrub.
Dentate. With tooth-like projections.
Denticle; denticulate. A little tooth; having an edge with small projecting teeth.
Depressed. Flattened vertically.
Dermal. Pertaining to the skin.
Disc. The flattened head and body of various fishes, which also commonly includes the pectoral and ventral fins.
Distal. Remote from the point of attachment.
Dorsal. Pertaining to the back.

Elongate. Extended; drawn out.
Emarginate. With the margin slightly hollowed.
Entire. With a smooth margin.
Erectile. Susceptible of being raised or erected.
Estuarine. Living in estuaries.

Falcate. Scythe-shaped; long, narrow, and curved.
Falciform. Curved like a scythe.
Filament. A slender or thread-like structure.
Filiform. Thread-like.
Fimbriate. Fringed at the margin.
Fluviatile. Living in rivers.
Furcate. Forked.

Gill-arches. The bony arches to which the gills are attached.
Gill-membranes. Membranes covering the gill openings, attached to the branchiostegals.
Gill-openings. Openings behind the head, leading to the gills.
Gill rakers. A series of appendages along the anterior edges of the gill arches.
Gills. Branchiae; organs for breathing the air contained in water.
Glossohyal. The tongue bone.

Humerus, Humeral. Bone of the upper arm, and pertaining thereto.
Hypocoracoid. The lower of the two bones attached to the clavicle.
Hypural joint. The joint of the caudal fin with the last of the vertebrae.

Imbricate. Overlapping, like the shingles on a roof.
Incisors. The front or cutting teeth.
Interdorsal. Between the dorsal fins.
Interorbital. The space between the orbits.
Isthmus. The fleshy projection of the body separating the gill openings.

Jugular. Pertaining to the throat; placed below the throat.
Juxtaposed. Contiguous; placed near together.

Lanceolate. Spear-shaped; gradually tapering toward the extremity.
Lateral. At or toward the side.
Lateral line. A series of muciferous tubes forming a raised line along the side of the body.
Lunate. Shaped like a crescent moon.

Mandible. The lower jaw.
Maxilla or maxillary. The upper jaw, or pertaining thereto.
Maxillaries. The hindmost bones of the upper jaw; preceded by the premaxillaries.
Median. Pertaining to the middle.
Mediolateral. Between the middle and the sides.
Mesocoracoid. A bone of the pectoral arch or shoulder girdle.
Molars. Blunt and rounded grinding teeth.
Muciferous. Producing or containing mucous or slime.

Nape. The part of the neck adjoining the skull.
Nasal. Pertaining to the nostrils.
Nasoral. Between the nostrils and the mouth.
Nictitating membrane. An inner eyelid.
Nuchal. Pertaining to the nape.

Obsolete. Faintly marked; scarcely evident.
Obtuse. Blunt.
Occipital. Pertaining to the occiput or hinder part of the skull.
Ocellus. An eye-like spot.
Oesophagus. The gullet.
Opercle or Operculum. Gill cover; the posterior membrane bone of the side of the head.
Orbit. The eye socket.
Osseus. Bony.
Ovate. Egg-shaped.

Palate. The roof of the mouth.
Palatines. Membrane bones on each side of the palate.
Papilla. A small fleshy projection.
Papillose. Covered with papillae.
Pectoral. Pertaining to the breast.
Pectoral fins. The anterior or uppermost of the paired fins, which correspond to the anterior limbs of the higher vertebrates.
Peduncle. The stalk or basal support of the tail.
Pelagic. Living on or in the open seas.
Pelvis. The bones to which the hind limbs or ventral fins are attached.
Pharyngeal bones. Bones behind the gills in the oesophagus or gullet.
Posterior. Relating to the hinder portion.
Postorbital. Behind the eye.
Precaudal. Anterior to the tail portion.
Premaxillaries. Two bones forming the front portion of the upper jaw.
Preopercle. The membrane bone between the cheek and the gill cover.

Protractile. Capable of being extended forward.
Proximal. Nearest.
Pseudobranchiae. Small gills developed on the inner side of the gill cover.
Pubic bones. Same as the pelvic bones.

Radius. Outer bone of forearm.
Ramus. One branch or one half of the jaw.
Ray. A jointed rod which supports the fin.
Retrorse. Turned backward.
Rostrum. A projecting snout or beak.
Rugose. Rough.

Scapula. Shoulder blade; a bone of the shoulder girdle.
Scute. Any external horny or bony plate.
Serrate. Notched like a saw.
Setae. Bristles, or hairs.
Soft dorsal. The posterior part of the dorsal fin which is composed of jointed rays.
Spine. A sharp projecting point; an unjointed support in the anterior portions of the dorsal and anal fins.
Spinous, spiniform, and spinate. Spine-like or composed of spines.
Spinous dorsal. The anterior part of the dorsal fin supported by spines.
Spiracles. Openings behind the eye in sharks and rays.
Sub- (a prefix). Less than, somewhat, not quite, under, &c.
Suborbital. Below the eye.
Superior. Above or on the upper surface.
Supralateral. Above the side.
Supramaxillary. A supplemental bone lying along the upper edge of the maxillary.
Supraorbital. Above the eye.
Suprascapular. A bone uniting the shoulder girdle with the skull.
Suture. The line of union of two bones or plates.
Symphysis. Point of junction of two parts of the jaw.
Symmetrical. Similarly arranged on both sides.
Synonym. A different word having the same or a similar meaning.

Terminal. At the end.
Tessellated. Marked with little checks or squares, like tiles.
Thoracic. Pertaining to the chest.
Transverse. Crosswise.
Trilobate. With three lobes.
Tricuspid. With three cusps or points.
Truncate. Terminating abruptly, as if cut off square.
Tubercle. A small excrescence, usually hard.
Tubiform or tubuliform. Resembling a tube.

Undulated. Waved.
Uniform, as applied to colouration. Of one colour.

Vent. The external opening of the alimentary canal.
Ventral. Pertaining to the abdominal or lower surface.
Ventral fins. Paired fins behind or below the pectoral fins, which correspond to the hind limbs of higher vertebrates.
Vertebrae. The bones of the spinal column.
Vertical fins. Fins on the median line of the body; the dorsal, anal, and caudal fins.
Villiform teeth. Slender and small teeth forming velvety bands.
Vomer. A bone forming the front part of the roof of the mouth.

CHECK LIST OF THE FISH AND FISH-LIKE ANIMALS OF NEW SOUTH WALES.

By Allan R. McCulloch, Zoologist, Australian Museum.

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Part i.

Though there are already several lists of the "Fishes" of New South Wales, they do not enable one to identify the numerous species unless one has access to a well stocked library. The purpose of the present list is to overcome this difficulty, and it is hoped that the accompanying keys and illustrations will indicate the identity of any recorded from the waters of this State.

Five hundred and eighty-eight species are at present listed from both the marine and fresh waters of New South Wales, though a number of them are very rare here, and their inclusion is, in some cases, based upon the capture of only one or two specimens. A few others will probably prove to be synonymous with one another, but there are doubtless additional species now known only from Queensland or Victoria, whose range will be later found to extend into New South Wales. As at present known, there are about 1900 Sharks, Rays, and Fishes recorded from Australian waters, so that the fish fauna of this State would appear to include approximately a third of the total.

The marine fish fauna of New South Wales is made up of two distinct elements, one consisting of tropical fishes which have extended their range southward from Queensland, and the other of southern species ranging northward. The northern forms occasionally straggle southward of Port Jackson, entering the cooler latitudes by way of a warm current which sweeps down from Queensland during a certain portion of the year. The general temperature of our waters, however, appears to be more favourable to the southern species, which constitute the greater portion of our fish fauna.

Illustrations.—The illustrations are in almost every case miniature reproductions of the figures quoted; with few exceptions a typical species of each genus is figured, and when a genus includes several and varied species, two or more figures are supplied. A reader wishing to identify any specimen may therefore turn over the plates until something resembling it is found; he can then refer to the number in the text corresponding to that of the illustration, which will direct him to simple keys indicating the specific characters of the allied species.

Acknowledgments.—For the preparation of the excellent photographs which compose the plates I am greatly indebted to Mr. T. C. Roughley, who has

spared no pains to overcome numerous difficulties in their production; stains in the paper of the older plates, folds and other surface irregularities, and conflicting colours, have each presented their troubles, which he has consistently disposed of.

I have further to gratefully acknowledge the loan of numerous originals of the figures quoted, with permission to republish them in reduced form; references to the publications in which they originally appeared are given throughout the text. The greater number of these have been lent by the Trustees and the Director of the Australian Museum, and others by the Director of the Queensland Museum, and the Director of the South Australian Museum; I am similarly indebted to the Councils of the Linnean and Royal Societies of New South Wales. Likewise, equally grateful acknowledgment is here rendered to the numerous authors of the papers quoted, whose figures have been copied on the accompanying plates.

Finally, I owe much to the Council of the Royal Zoological Society of New South Wales for undertaking the expensive work of publication.

Keys, and How to Use Them.—Though the accompanying keys may at first sight appear involved, a little practice in their use will prove them to be quite simple. The letters before each section are to be regarded as mere *symbols without alphabetical value*, which might be replaced by any other set of symbols. The divisions and subdivisions in the keys are always alternative to one another, so that if a species does not have the characters ascribed to any section denoted by a single letter, it should be compared with those in the alternative section denoted by the same letter in duplicate. Thus, if the specimen does not fit into section A of a key, its characters will probably be found under section AA; it may then be further restricted by comparison with sections under AA—say, H, for example, and if it is found to differ from the characters there denoted, it should be compared with HH, and so on. The relative insetting of the various divisions of the keys further indicates their alternative characters, and also serves as a guide to the subdivisions included within them.

Key to the larger divisions of the Fish-like Animals.

A. Cranium wanting. LANCELET. *Subphylum Acrania* or *Cephalochordata* (No. i. only).

AA. Cranium present. *Subphylum Craniata* or *Vertebrata* (No. ii. and onward).

B. Nasal apparatus single and median; no lower jaw. LAMPREY. Class *Cyclostomata* (No. ii. only).

BB. Nasal apparatus paired; lower jaw present.

C. Skull without (Plagiostomi) or with only a rudimentary (Holocephali) operculum; males with paired intromittent organs. SHARKS and RAYS. Class *Elasmobranchii* (Nos. iii.-xxv.).

CC. Skull with an operculum on each side; males without paired intromittent organs. FISHES. Class *Pisces* (No. xxvi. and onward).

I. LANCELETS. Subphylum ACRANIA or CEPHALOCHORDATA.

Family BRANCHIOSTOMIDAE.

1. EPIGONICHTHYS Peters, Monatsb. Akad. Berlin, 1876, p. 325 (*cultellus*).

1a. E. BASSANUS. LANCELET. *Branchiostoma bassanum* Gunther, Voy. Alert, Zool., 1884, p. 31; *Heteropleuron bassanum* Kirkaldy, Quart. Journ. Micr. Soc. (n. ser.) xxxvii., 1895, p. 314, pl. 34, 6 (Pl. i.).

A small semitransparent, marine animal, about 1½ inches long, which has no back-bone. It burrows in sand.

BACK-BONED ANIMALS. Subphylum CRANIATA or VERTEBRATA.
LAMPREYS and HAG-FISHES. Class CYCLOSTOMATA.

II. Family MORDACIIDAE.

2. MORDACIA Gray, Proc. Zool. Soc. 1851, p. 239 (*mordax*).

2a. M. MORDAX. SHORT-HEADED LAMPREY. *Petromyzon mordax* Richardson, Ichth. Erebus and Terror, 1846, p. 62, pl. 38, 3-6 (Pl. i.).

An eel-shaped animal with a suctorial mouth armed with horny teeth by means of which it rasps holes in the flesh of living fishes upon which it feeds. It is marine in its younger stages, but ascends rivers to breed. Rare in New South Wales.

SHARKS, RAYS, AND GHOST SHARKS. Class ELASMOBRANCHII.

A. Five to seven external gill-openings; dorsal spine, if present not erectile; teeth numerous.
SHARKS and RAYS. Subclass *Plagiostomi* (Nos. iii.-xxiv.).

AA. One external gill-opening; an erectile dorsal spine; teeth few.
GHOST SHARKS. Subclass *Holocephali* (No. xxv. only).

SHARKS AND RAYS. Subclass PLAGIOSTOMI.

A. Gill-openings on the sides; pectorals not attached to the head; body subfusiform. SHARKS. Order *Selachii* (Nos. iii.-xvii.).

AA. Gill-openings on the lower surface; pectorals attached to the head; body discoid. RAYS. Order *Batoidei* (Nos. xviii.-xxiv.).

SHARKS. Order SELACHII.

A. 6-7 gill openings; one dorsal fin.
B. No gill-openings crossing the throat, mouth inferior.
Family *Hexanchidae* (No. iii.).
BB. Margin of first gill-opening free across the throat, mouth anterior.
Family *Chlamydoselachidae* (No. iv.).

AA. 5 gill-openings; two dorsal fins.
C. Anal fin present.
D. Dorsal fins with fixed spines. Family *Heterodontidae* (No. v.).
DD. No dorsal spines.
E. Eyes with nictitating membranes.
F. Functional teeth upstanding, triangular, and compressed.
G. Head normally formed. Family *Carcharhinidae* (No. vi.).
GG. Head hammer or kidney shaped.
Family *Sphyrnidae* (No. viii.).
FF. Teeth flattened, in bands or pavements.
Family *Mustelidae* (No. vii.).
EE. Eyes without nictitating membranes.
H. First dorsal over or behind the ventrals.
I. Nasoral grooves present. Family *Orectolobidae* (No. ix.).
II. No nasoral grooves. Family *Scylliorhinidae* (No. x.).
HH. First dorsal more or less in advance of the ventrals.
J. Caudal peduncle without lateral keels.
K. Tail very long; more than half the total length.
Family *Alodiidae* (No. xi.).
KK. Tail normal; less than half the total length.
Family *Carchariidae* (No. xii.).

JJ. Caudal peduncle with lateral keels.
L. Gill-openings moderate, teeth large.
Family *Isuridae* (No. xiii.).
LL. Gill-openings very wide, teeth small.
Family *Cetorhinidae* (No. xiv.).

CC. Anal fin absent.
M. Body subcylindrical, pectoral fins normal.
N. Dorsal fins with spines, snout normal. Family *Squalidae* (No. xv.).
NN. Dorsal fins without spines, snout saw-like.
Family *Pristiophoridae* (No. xvi.).
MM. Body depressed; pectoral fins greatly enlarged, with an anterior extension separated from the body by a notch.
Family *Squatinidae* (No. xvii.).

III. Family HEXANCHIDAE.

A. Head broad, snout broad. *Notorhynchus* (3).
AA. Head tapering, snout narrow. *Heptranchias* (4).

3. NOTORHYNCHUS Ayres, Proc. Cal. Acad. Sci. i, 1855, p. 73 (*maculatus*).

3a. N. PECTOROSUS. Seven-gilled Shark. *Heptranchias pectorosus* Garman, Bull. Essex. Inst. xvi, 1884, p. 56; *Heptranchias indicus* Macdonald and Barron, Proc Zool. Soc. 1868, p. 371, pl. 33. (Pl. i.).

A small shark, with numerous primitive characters, reaching about eight feet in length; the teeth are of remarkable form, and very different in each jaw. Rare in our waters.

4. HEPTRANCHIAS Rafinesque, Caratt. gen. spec. Sicilia, 1810, p. 13 (*cinereus*).

4a. H. PERLO. One-finned Shark. *Squalus perlo* Bonnaterre, Encycl. Meth., Ichth., 1788. p 10; *H. perlo* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 2, pl. 1, 1. (Pl. i.).

A deep water species recently taken off Botany Bay by the State Trawlers. It ranges from the Mediterranean and neighbouring Atlantic to Japan and southern Australia. It is a small species with primitive characters like the preceding.

IV. Family CHLAMYDOSELACHIDAE.

5. CHLAMYDOSELACHUS Garman, Bull. Essex. Inst. xvi, 1884, p. 52 (*anguineus*).

5a. C. SP. FRILLED-GILLED SHARK. *Chlamydoselachus sp.* Stead, P.L.S. N.S.W. xxxii, 1907, p. 554.

The inclusion of this widely distributed genus in this list is based upon some remains found in Port Jackson. The typical species, *C. anguineus*, is a very primitive shark first described from Japan, which grows to about six feet in length.

V. Family HETERODONTIDAE.

A. Supraorbital ridges gradually decreasing in height posteriorly; enlarged lateral teeth not carinate. *Heterodontus* (6).
AA. Supraorbital ridges ending abruptly posteriorly; enlarged lateral teeth with distinct keels. *Gyropleurodus*(7).

6. HETERODONTUS Blainville Bull. Soc. Philom. viii, 1816, p. 121 (*philippi*).

6a. H. PHILIPPI. PORT JACKSON SHARK. *Squalus philippi* Bloch & Schneider, Syst. Ichth., 1801, p. 134; *H. philippi* McCoy, Prodr. Zool. Viet. dec. xii, 1886, pl. 113. (Pl. i.).

Common in the shallower waters of the southern half of Australia. Fossil remains of allied forms are known from the Carboniferous Series, and indicate that these sharks were more numerous in Palaeozoic and Mesozoic times than at present. The teeth are of remarkable form, being adapted for crushing the shell-fish, etc., upon which this species feeds. Attains a length of about four feet.

7. GYROPLEURODUS Gill, Proc. Acad. Nat. Sci. Philad., 1862, pp. 331 and 489 (*francisci*).

7a. G. GALEATUS. CRESTED PORT JACKSON SHARK. *Cestracion galeatus* Gunther, Brit. Mus. Cat. Fish. viii, 1870, p. 416; *Heterodontus galeatus* Macl. & Macl., P.L.S. N.S.W. iii, 1879, p. 313, pl. 25. (Pl. i.).

Less abundant than the preceding species, but similar in both habits and appearance. The egg-cases of both are of remarkable form, being spiral, and, in this species, provided with long tendrils.

VI. Family CARCHARHINIDAE.

A. Spiracles present.
  B. A conspicuous pit above the root of the tail; subcaudal lobe very long. *Galeocerdo* (11).
  BB. No pit at the root of the tail; subcaudal lobe short. *Galeorhinus* (12).
AA. Spiracles absent.
  C. First dorsal nearer pectorals than ventrals.
    D. Teeth serrated on the base in the upper series only. *Hypoprion* (9).
    DD. Teeth serrated on both bases and cusps. *Carcharhinus* (8).
  CC. First dorsal nearer the ventrals than the pectorals. *Prionace* (10).

8. CARCHARHINUS Blainville, Bull. Soc. Philom. viii, 1816, p. 121 (*commersonii*).

A. Teeth of both jaws serrated.
  BB. Upper teeth deeply notched on the outer edge. *gangeticus* (8a),
AA. Teeth of lower jaw entire; upper teeth scarcely notched. *brachyurus* (8b).
  B. Upper teeth slightly notched on the outer edge. *stevensi* (8c).

8a. C. GANGETICUS SEA SHARK. *Carcharias, Prionodon, gangeticus* Mull. & Henle, Plagiost., 1838, p. 39, pl. 13.

Grows to at least seven feet long. A ferocious species in Indian estuaries.

8b. C. BRACHYURUS. WHALER. *Carcharias, Prionodon, brachyurus* Gthr., Brit. Mus. Cat. Fish. viii, 1870, p. 369; *Id.* Waite, Rec. Aust. Mus. vi, 1906, p. 226. pl. 39. (Pl. i.).

A common species growing to twelve feet in length.

8c. C. STEVENSI. *Carcharias stevensi* Ogilby, Ann. Qld. Mus. x, 1911, p. 38.

A little known species from northern New South Wales and Queensland.

9. HYPOPRION Mull & Henle, Plagiost., 1838, p. 34 (*macloti*).

9a. H. MACLOTI. LONG-NOSED SEA SHARK. *Id.* Mull & Henle, *Loc. cit.*, pl. 10. (Pl. i.).

Only once recorded from Port Jackson; the specimen was 3 feet long.

---

8 (A). RHIZOPRION Ogilby, Mem. Qld. Mus. iii, 1915, p. 132 (*crenidens*).

8 (A)a. R. CRENIDENS. *Carcharias, Scoliodon, crenidens* Klunzinger, Sitzb. Akad. Wiss. Wien lxxx. i, 1879, p. 426, pl. 8, 3. Recorded from off Cape Byron by Ogilby, Mem. Qld. Mus. iii, 1915, p. 132.

10. PRIONACE Cantor, Cat. Malay. Fish., 1850, p. 399 (*glauca*).

10a. P. GLAUCA. BLUE SHARK. *Squalus glaucus* Linne, Syst. Nat. 10th ed., 1758, p. 235; *Galeus glaucus* Garman, Mem. Mus. Comp. Zool. xxxvi, 1913, p. 145, pl. 3, fig. 1-3. (Pl. i.).

Widely distributed over most warm seas, but not certainly known from New South Wales. Grows to 15 feet in length.

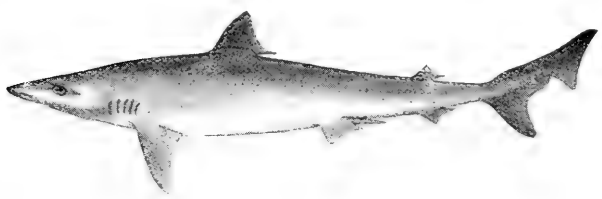
11. GALEOCERDO Mull. & Henle, Arch. Naturg. iii. I, 1837, p. 398 (*arcticus*).

11a. G. ARCTICUS. TIGER SHARK. *Squalus arcticus* Faber, Naturg. Fisch Iss., 1829, p. 17; *G. rayneri* Macdon. & Barron, P.Z.S. 1868, p. 368, pl. 32. (Pl. i.).

A common and dangerous species reaching a length of at least sixteen feet. It is widely distributed throughout temperate and tropical seas, and often appears in our harbours and estuaries.

12. GALEORHINUS Blainville, Bull. Soc. Philom. 1816, p. 121 (*canis*).

12a. G. AUSTRALIS. SCHOOL SHARK. *Galeus australis* Macleay, P.L.S. N.S.W. vi, 1881, p. 354; *Id.* McCoy, Prodr. Zool. Viet. dec. vii, 1882, pl. 64, 2.



A very common species, growing to about five feet long.

VII. Family MUSTELIDAE.

13. MUSTELUS Linck, Mag. neue Phys. u. Nat. vi, 1790, p. 31 (*mustelus*).

13a. M. ANTARCTICUS. GUMMY. *M. antarcticus* Gthr., Brit. Mus. Cat. Fish. viii, 1870, p. 387; *Id.* McCul., Rec. Aust. Mus. vii, 1909, p. 315, pl. 90, 3. (Pl. i.).

Another small and harmless species, reaching about 3½ feet in length. The blunt, pavement-like teeth, from which this shark derives its popular name, serve to crush up shell-fish and crustaceans, etc. The young are developed within the body of the parent, and supplied with nourishment by means of a remarkable structure resembling the placenta of mammals.

VIII. Family SPHYRNIDAE.

14. SPHYRNA Rafinsq., Indies Ittiol Sicil., 1810, pp. 46, 60 (*zygaena*).

14a. S. ZYGAENA. HAMMER-HEADED SHARK. *Squalus zygaena* Linne, Syst. Nat. 10th ed., 1758, p. 234; *Cestracion zygaena* Garman, Mem. Mus. Comp. Zool. xxxvi, 1913, p. 157, pl. 1, 1-3. (Pl. i.).

Grows to at least fifteen feet long, and is very dangerous to man. Not uncommon in the open sea, and remarkable for the lateral expansions of the head, which bear the eyes. The young are very numerous and are born alive.

IX. Family ORECTOLOBIDAE.

A. Sides of head with skinny lobes anteriorly. *Orectolobus* (15).
AA. Sides of head without lobes.
B. Anal commencing before the second dorsal. *Parascyllium* (17).
BB. Anal behind the second dorsal.
C. First dorsal behind the ventrals; spiracle below the eye. *Brachaelurus* (16).
CC. First dorsal above the ventrals; spiracle behind the eye. *Stegostoma* (18).

15. ORECTOLOBUS Bonaparte, Icon. Faun. Ital., Pesc., fasc. 7, 1837 ?, p. 11 (*barbatus*).

15a. O. MACULATUS. WOBBEGONG. *Squalus maculatus* Bonnaterre, Encycl. Meth., Ichth., 1788, p. 8; *O. maculatus* Ogil. & McCul., P. Roy. Soc. N.S.W. xlii, 1909, p. 273, pl. 42, 2. (Pl. i.).

Reaches a length of 5-6 feet. Common among rocks on the coast, where it lies in wait for its prey. Not harmful to man unless it accidentally catches a wader's foot or hand The young are produced alive and in large numbers.

15b. O. DEVISI CARPET SHARK. *Id.* Ogilby, Mem. Qld. Mus. v, 1916, p. 181; *O. ornatus* Ogil. & McCul., P. Roy. Soc. N.S.W. xlii, 1909, p. 276, pl. 42, 1. (Pl. i.).

A somewhat larger and more ornate species than the preceding, but with similar habits and structure.

16. BRACHAELURUS Ogilby, P. Roy. Soc. Qld. xx, 1907, p. 27 (*modestus*).

16a. B. MODESTUS. BLIND SHARK. *Chiloscyllium modestum* Gthr., P.Z.S., 1871, p. 654, pl. 54. (Pl. i.).

A small species about three feet long, which is commonly taken by rock fishermen on the coast. The young are born alive.

17. PARASCYLLIUM Gill, Ann. Lyc. Nat. Hist. N. York, vii, 1861, pp. 407, 412 (*variolatum*)

17a. P. COLLARE. COLLARED CAT SHARK. *P. collare* Rams. & Ogil., P.L.S N.S.W. (2) iii, 1888, p. 1310; Id. Waite, Mem. Aust. Mus. iv. 1, 1899, p. 32, pl. 2. 2. (Pl. i.).

Plentiful in the deeper waters, where it is commonly taken by trawlers. Reaches about three feet in length. This species deposits eggs which are enclosed in oblong horny cases, and are attached to weeds by means of long tendrils at the angles.

18. STEGOSTOMA Mull. & Henle, Arch. Naturg. iii. 1, 1837, p. 395 (*fasciatum*).

18a. S. TYGRINUM ZEBRA SHARK. *Squalus tygrinus* Bonnaterre, Encycl. Meth., Ichth., 1788, p. 8; *S. tigrinum* Day, Fish. India, 1878, p. 725, pl. 187, 4. (Pl. ii.).

A tropical shark which rarely strays into our waters. It feeds upon shell-fish and crabs, etc., and grows to about six feet long.

X. Family SCYLLIORHINIDAE.

19. HALAELURUS Gill, Ann. Lyc. Nat. Hist. N. York, vii, 1861, p. 407 (*burgeri*).

19a. H. ANALIS. SPOTTED CAT SHARK. *Scyllium anale* Ogilby, P.L.S.

N.S.W. x, 1885, p. 445; *Catulus analis* Waite, Mem. Aust. Mus. iv. 1, 1899, p. 31, pl. 2, 1. (Pl. ii.).

A deeper water species, often taken by the trawlers, which rarely grows above two feet long. The young are produced from eggs.

XI. Family ALOPIIDAE.

20. ALOPIAS Rafinsq., Caratt. Gen. Spec. Sicilia, 1810, p. 12 (*macrourus*).

20a. A. VULPINUS. THRESHER SHARK. *Squalus vulpinus* Bonnat., Encycl. Meth., Ichth., 1788, p. 9; *Vulpecula marina* Garman, Mem. Mus. Comp. Zool. xxxvi, 1913, p. 30, pl. 7, 1-3. (Pl. ii.).

Distributed over all warm seas, and occasionally seen off our coast. Grows to fifteen feet in length, half of which is made up of the greatly elongated tail; this last is used to splash the surface of the sea near a shoal of fish so as to frighten them together. A common idea that the Thresher attacks whales apparently rests upon erroneous observations.

XII. Family CARCHARIIDAE.

21. CARCHARIUS Rafinesque, Carratt. Gen. Spec. Sicilia, 1810, p. 10 (*taurus*).

21a. C. ARENARIUS. GREY NURSE. *Id.* Ogilby, Ann. Qld. Mus. x, 1911, p. 37; *Odontaspis taurus* McCoy, Prodr. Zool. Vict. dec. vii, 1882, pl. 64, 1.

A very common shark on the coast, where it chases schools of fish near the beaches. It is said to occasionally attack man, and to reach a length of fifteen feet.

21b. C. TRICUSPIDATUS. BLUE NURSE. *Id.* Day, Fish. India, 1878, p. 713, pl. 186, 1. (Pl. ii.).

Grows to over twelve feet in length.

XIII. Family ISURIDAE.

A. Teeth awl-shaped, with smooth edges. *Isurus* (22).
AA. Teeth large and triangular, with serrated edges. *Carcharodon* (23).

22. ISURUS Rafinesque, Caratt. Gen. Spec. Sicilia, 1810, p. 11 (*oxyrhynchus*).

22a. I. GLAUCUS. BLUE POINTER. *Oxyrhina glauca* Mull. & Henle, Plagiost. 1838, p. 69, pl. 29. (Pl. xvii.)

Said to be common in Port Jackson, and to reach a length of twelve feet.

23. CARCHARODON Muller & Henle, Mag. Nat. Hist. (2) ii. 1838, p. 37 (*rondeletii*).

23a C. CARCHARIAS. WHITE SHARK. *Squalus carcharias* Linne, Syst. Nat. 10th. ed., 1758, p. 235; *C. carcharias* Garman, Mem. Mus. Comp. Zool. xxxvi, 1913, p. 32, pl. 5, 5-9. (Pl. ii.).

A fierce and destructive species which attains a length of forty feet. It ranges over all warm and temperate seas, and has been recorded on several occasions from our waters. Fossil teeth of a closely allied species indicate that a very recently extinct relative of this shark must have reached at least eighty feet in length.

XIV. Family CETORHINIDAE.

24. CETORHINUS Blainville, Bull. Soc. Philom. viii, 1816, p. 121 (*gunneri*).

24a. C. MAXIMUS. BASKING SHARK. *Squalus maximus* Gunner, Trondhj.

Selskab. iii. 1765, p. 33; *Selache maxima* Day, Fish. Gt. Brit & Ireld. ii, 1880-1884, p. 303, pl. 158, 1. (Pl. ii.).

A very large, but harmless shark, attaining a length of 35 feet. It occurs in all warm and temperate seas, but has only once been noted in our waters. Its food consists of minute floating animals, which are apparently strained from the water by means of peculiar comb-like structures on the gill-arches.

XV. Family SQUALIDAE.

25. SQUALUS Linne, Syst. Nat. 10th ed., 1758, p. 233 (*acanthias*).

25a. S. MEGALOPS. PIKED DOG-FISH. *Acanthias megalops* Macleay, P.L.S. N.S.W. vi. 1881, p. 367. (Pl. ii.).

Abundant in somewhat deeper waters, where it is taken by the trawlers. Grows to nearly three feet in length. Though this shark is disdained as food, quantities of an allied species are imported into Australia in a smoked condition, and sold as "Smoked Haddock."

XVI. Family PRISTIOPHORIDAE.

26. PRISTIOPHORUS Mull. & Henle, Arch. Naturg. iii. 1, 1837, p. 399 (*cirratus*).

26a. P. CIRRATUS. SAW SHARK. *Pristis cirratus* Latham, Tr. Linn. Soc. Lond. ii, 1794, p. 281, pls. 26, 5 & 27. (The figure on Pl. ii. represents a closely allied species *P. nudipinnis*).

Very common, and growing to about four feet long. The toothed blade which forms the snout is an effective weapon of attack among the schools of herring and other small fishes upon which these sharks feed. The young are born alive, and have the teeth of the snout laid flat against the sides so as to avoid injury to the mother.

XVII. Family SQUATINIDAE.

27. SQUATINA Dumeril, Zool. Analyt., 1806, pp. 102, 342 (*angelus*).

27a. S. AUSTRALIS. ANGEL SHARK. *Id.* Regan, A.M.N.H. (7) xviii, 1906, p. 438; *Rhina squatina* McCoy, Prodr. Zool. Viet. dec. iv, 1879, pl. 34. (Pl. ii.).

Common, and reaching a length of about five feet. It feeds upon crabs and shell-fish, etc., and produces its young alive. The body is depressed and flat, like that of a ray, but the gill-openings are on the sides as in the sharks.

RAYS—Order BATOIDEI.

Key to the Families of Rays recorded from New South Wales.

A. Snout produced into a saw-like blade. *Pristidae* (xvii.).
AA. Snout not saw-like.
  B. Head without free horn-like fins.
    C. Caudal fin large, tail stout.
      D. Electric organs absent or incipient, skin scaly. *Rhinobatidae* (xix.).
      DD. Electric organs present, skin soft and naked. *Narcobatidae* (xx.).
    CC. Caudal fin smaller or absent, tail more slender.
      E. Tail without a serrated spine. *Rajidae* (xxi.).
      EE. Tail usually with a serrated spine.
        F. Teeth small and numerous. *Dasyatidae* (xxii.).
        FF. Teeth few, large, flat and tessellated. *Myliobatidae* (xxiii.).
  BB. Head with two horn-like fins. *Mobulidae* (xxiv.).

XVIII. Family PRISTIDAE.

28. PRISTIS Linck, Mag. Neue Phys. Naturg. vi., 1790, p. 31 (*pristis*).

28a. P. ZYSRON. SAWFISH. *Id.* Bleeker, Verh. Bat. Gen. xxiv, 1851, p. 55; *Id.* Day, Fish. India, 1878, p. 729, pl. 191, 2. (Pl. ii.).

Grows to 20 feet long, and is much dreaded because of fearful injuries it inflicts with lateral strokes of its powerful "saw." It is widely distributed, and is occasionally taken in estuaries on our coast.

XIX. Family RHINOBATIDAE.

A. Dorsal opposite the ventrals, a subcaudal lobe; body ornate. *Rhynchobatus* (29).
AA. Dorsal behind the ventrals; no subcaudal lobe.
B. Snout long, sharply-pointed and shovel-shaped; body plain coloured. *Rhinobatos* (30).
BB. Snout shorter, obtuse; body ornate. *Trygonorrhina* (31).

29. RHYNCHOBATUS Mull. & Henle, Arch. Naturg. iii. 1, 1837, p. 399 (*laevis*).

29a. R. DJIDDENSIS. WHITE-SPOTTED RAY. *Raja djiddensis* Forskal, Descr. Anim., 1775, p. 18; *R. djeddensis* Day, Fish. India, 1878, p. 730, pl. 192, 1. (Pl. ii.).

Grows to seven feet long, and is said to be not uncommon.

30. RHINOBATOS Linck. Mag. Neustes Physik. Naturg., 1790, p. 32 (*rhinobatos*).

30a. R. BANKSII. SHOVEL-NOSED RAY. *Id.* Mull. & Henle, Plagiost., 1838, p. 123; *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 38, pl. 3. (Pl. ii.).

A common species growing to four feet in length.

31. TRYGONORRHINA Mull & Henle, Mag. Nat. Hist. (2) ii, 1838, p. 90 (*fasciata.*).

31a. T. FASCIATA. FIDDLER. *Id.* Mull. & Henle, *Loc. cit.*, pl. 43. (Pl. ii.).

Common, and reaching a length of four feet.

XX. Family NARCOBATIDAE.

A. Tail shorter than the disc.
B. Caudal fin large, disc broader than long. *Nacobatus* (32).
BB. Caudal fin small; disc as long as broad. *Hypnarce* (33).
AA. Tail longer than the disc. *Narcine* (34).

32. NARCOBATUS Blainv., Bull. Soc. Philom. 1816, p. 121 (*torpedo*).

32a. N. FAIRCHILDI. ELECTRIC RAY. *Torpedo fairchildi* Hutton, Cat. Fish. N. Zeal., 1872, p. 83, pl. 12, fig. 134; *Id.* McCul., Rec. Aust. Mus. xii. 8, 1919, p. 171, pl. xxv. (Pl. iii.).

One specimen twenty-eight inches long taken in deep water by the State trawlers.

33. HYPNARCE Waite, Rec. Austr. Mus. iv. 5, 1902, p. 180 (*subnigra*).

33a. H. SUBNIGRA. NUMBFISH. *Id.* Dumeril, Rev. Mag. Zool. (2) iv, 1852, p. 279, pl. 12. (Pl. iii.).

Not uncommon, and grows to over two feet long. The electric discharge given off by this Ray is very powerful, and serves to paralyse its prey as well as to scare off its enemies.

34. NARCINE Henle, Ann. Sci. Nat. ii., 1834, p. 31 (*brasiliensis*).

34a. N. TASMANIENSIS. LITTLE NUMBFISH. *Id.* Richardson, P.Z.S. 1841, p. 22, and Tr. Z.S. iii, 1849, p. 178, pl. 11, 2. (Pl. iii.).

Very plentiful in the deeper water off the coast, and often taken by the trawlers. Grows to a little over a foot long.

XXI. Family RAJIDAE.

35. RAJA Linne, Syst. Nat. 10th ed., 1758, p. 231 (*batis*).

A. Upper surface smooth, with but few large spines. *australis* (35a).
AA. Entire upper surface covered with minute spines.
B. Snout produced, lower surface with minute spines. *scabra* (35b).
BB. Snout not projecting, lower surface smooth. *nitida* (35c).

35a. R. AUSTRALIS. COMMON SKATE. *Raia australis* Macleay, P.L.S. N.S.W. viii. 1884, p. 461; Waite, Mem. Austr. Mus. iv. 1, 1899, p. 40, pl. 4. (Pl. iii).

Grows to 19 inches long, and is common in the deeper waters.

35b. R. SCABRA. GREAT SKATE. *Raia scabra* Ogilby, Cat. Fish. Austr. Mus. I, 1888, p. 17.

A rare and little known species, reaching 5½ feet in length.

35c. R. NITIDA. ROUGH-BACKED SKATE. *Id.* Gunther, Challenger Rept. Zool. i, 1880, p. 27, pl. 14, a.

A small deep-water species, growing to a little over a foot long.

XXII. Family DASYATIDAE.

A. Tail long and whip-like, no caudal fin.
B. Tail with keels or folds.
C. Dental surface of jaws straight or undulous, back more or less smooth, tail-folds narrow. *Dasyatis* (36).
CC. Dental surface of upper jaw angular, back with rough scales, a broad fold below the tail. *Pastinachus* (37).
BB. Tail without keels or folds. *Himanatura* (38).
AA. Tail moderate or short.
D. Disc subcircular, tail stout, caudal fin present. *Urolophus* (39).
DD. Disc very wide, angular; tail slender, no caudal fin. *Pteroplatea* (40).

36. DASYATIS Rafinesque, Caratt. Gen. Spec. Sicilia, 1810, p. 16 (*ujo*).

A. Tail with a small fold above as well as below.
B. Scapular region smooth, or with spines on median line only; upper surface with blue spots. *kuhlii* (36a).
BB. Scapular region with a broad patch of tubercles; upper surface uniformly coloured. *fluviorum* (36b).
AA. Tail with a fold below, none above.
C. Back smooth or with isolated tubercles. *brevicaudatus* (36c).
CC. Back with numerous tubercles. *thetidis* (36d).

36a. D. KUHLII. BLUE-SPOTTED STINGAREE. *Trygon kuhlii* Mull. & Henle, Plagiost. 1838, p. 164, pl. 51, 2.

A tropical species once recorded from the Parramatta River estuary.

36b. D. FLUVIORUM. ESTUARY STINGAREE *Id.* Ogilby, P. Roy. Soc. Qld. xxi, 1908, p. 6; *Id.*, McCul., Biol. Res. Endeavour iii. 3, 1915, p. 103, pl. 16, 1 (Pl. iii.).

Grows to about one foot wide. Like all other Sting Rays, this species can inflict dangerous wounds with its barbed spine, which often causes blood-poisoning.

36c. D. BREVICAUDATUS. SMOOTH STINGAREE. *Trygon brevicaudatus* Hutton, A.M.N.H. (4) xvi, 1875, p. 317; *D. brevicaudatus* McCul., Biol. Res. Endeavour iii. 3, 1915, p. 102, pl. 15, 1. (Pl. iii.).

Not uncommon in deeper water, occasionally wandering into harbours and estuaries. Grows to at least four feet wide.

36d. D. THETIDIS. BLACK STINGAREE. *Id.* (Ogilby) Waite, Mem. Austr. Mus. iv. 1, 1899, p. 46.

A little-known, though apparently common species in our deeper waters, and growing to over four feet in width.

37. PASTINACHUS Ruppell, Atl. Reise Nordl. Afrika, 1828, p. 51 (*sephen*).

37a. P. SEPHEN. FANTAILED RAY. *Raja sephen* Forskal, Descr. Anim., 1775, p. 18; *Trygon sephen* Day, Fish. India, 1878, p. 740, pl. 195, 2. (Pl. iii.).

A tropical species, apparently common in the northern waters of the State Indian specimens have measured nearly six feet across the disc.

38. HIMANTURA Mull. & Henle, Arch. Naturg. iii. I, 1837, p. 400 (*uarnak*).

38a. H. UARNAK. COACHWHIP RAY. *Raja uarnak* Forsk., Descr. Anim., 1775, p. 18; *Trygon uarnak* Day, Fish. India, 1878, p. 737, pl. 194, 1. (Pl. iii.).

A tropical species, once recorded from the Clarence estuary. Grows to five feet wide, and is capable of inflicting very dangerous wounds with its spine.

39. UROLOPHUS Mull. & Henle, Arch. Nat. iii. I., 1837, p. 400 (*cruciatus*).

A. Tail shorter than its distance from the mouth. *aurantiacus* (39a).
AA. Tail longer than its distance from the mouth.
  B. Internasal valve broadly fringed posteriorly; nostrils with broad posterior lobes; tail without lateral folds. *testaceus* (39b).
  BB. Internasal valve with only a narrow fringe or lobules posteriorly; nostrils without broad posterior lobes.
    C. Papillae behind lower jaw fewer, back uniform. *viridis* (39c).
    CC. Papillae behind lower jaw numerous, back white-speckled. *bucculentus* (39d).

39a. U. AURANTIACUS. YELLOW-BACKED STINGAREE. *Id.* Mull. & Henle, Plagiost, 1841, p. 173, pl. 56; *Id.* McCull., Biol. Res. Endeavour iv. 4, 1916, p. 172, pl. 49. (Pl. iii.).

Commonly taken by the trawlers in deeper water. Grows to about 16 inches wide, and together with the following species, is commonly sold as Skate.

39b. U. TESTACEUS. COMMON STINGAREE. *Trygonoptera testacea* Mull. & Henle, Plagiost., 1841, p. 174, pl. 57; McCul., Biol. Res. Endeavour iv. 4, 1916, p. 174, pl. 50. (Pl. iii.).

Abundant on sandy flats in shallow water. Grows to about 12 inches wide.

39c. U. VIRIDIS. GREEN-BACKED STINGAREE. *Id.* McCul., Biol. Res. Endeavour iv. 4. 1916, p. 176, pl. 51.

Very commonly taken by the trawlers in deeper water. Grows to about 12 inches wide.

39d. U. BUCCULENTUS. SANDY-BACKED STINGAREE. *Id.* Macleay, P.L.S. N.S.W. ix, 1885, p. 172; *Trygonoptera bucculenta* Waite, Mem. Austr. Mus. iv. I, 1899, p. 44, pl. 5.

A larger and common species in deeper water, growing to at least 18 inches wide.

40. PTEROPLATEA Mull. & Henle, Arch. Naturg. iii. 1, 1837, p. 400 (*altavela*).

40a. P. AUSTRALIS. RAT-TAILED RAY. *Id.* Rams. & Ogil., P.L.S. N.S.W. x. 1886 p. 575; *Id.* McCul., Austr. Zool. i. 4, 1917, p. 89, pl. 10, 3. (Pl. iii.)

Apparently not uncommon in our northern waters, and growing to at least three feet wide.

XXIII. Family MYLIOBATIDAE.

A. Teeth in several series in each jaw, the median ones broadest. *Myliobatis* (41).
AA. Only one series of very broad teeth in each jaw. *Aetobatis* (42).

41. MYLIOBATIS Cuvier, Regne Anim. ii, 1817, p. 137 (*aquila*).

41a. M. AUSTRALIS. EAGLE RAY. *Id.* Macleay, P.L.S. N.S.W. vi, 1881, p. 380; *Id.* McCoy. Prodr. Zool. Viet. dec. vii, 1882, pl. 63. (Pl. iii.).

Not uncommon, and attaining a width of over 4 feet.

42. AETOBATIS Blainville, Bull. Soc. Philom. viii, 1816, p. 112 (*narinari*).

42a. A. NARINARI. SPOTTED EAGLE RAY. *Raia narinari* Euphrasen, Vet. Akad. Nya. Handl. xi, 1790, p. 217, pl. 10; Day, Fish. India, 1878, p 743, pl. 194, 4. (Pl. iii.).

A tropical species; only once recorded from our waters. Grows to six feet wide.

XXIV. Family MOBULIDAE.

43. MANTA Bancroft, Zool. Journ. iv, 1829, p. 454 (*americana*).

43a. M. ALFREDI. DEVIL FISH. *Ceratoptera alfredi* (Krefft), Macleay, P.L.S. N.S.W. vi, 1881, p. 381. (Pl. iii.).

Imperfectly known from a single specimen, 13½ feet wide, which is preserved in the Australian Museum; several others are said to have been observed on the coast. The accompanying photograph represents the typical stuffed specimen.

Order HOLOCEPHALI.

XXV. Family CHIMAERIDAE.

44. CHIMAERA Linne, Syst. Nat. 10th ed., 1758, p. 236 (*monstrosa*).

44a. C. OGILBYI. GHOST SHARK. *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 48, pl. 6. (Pl. ii.).

Occasionally taken by the trawlers in moderate depths. Grows to about two feet in length exclusive of the caudal filament.

Part ii.

Fishes.—CLASS PISCES.

BONY FISHES—Subclass TELEOSTEI.

The major divisions or Orders of the Fishes are each distinguished by complicated combinations of several external and internal characters; any of these may vary within the limits of a division, and may approach or even overlap those of some other division. There can accordingly be no simple key by which the Orders may be distinguished, but the characteristic features of each are stated under their proper headings, as follows:—

Herrings and Trout-like Fishes—Order ISOSPONDYLI.

Only one true dorsal fin, which is without spines; a secondary adipose dorsal may be present or absent.

A. One dorsal fin, no secondary adipose fin posteriorly.
  B. Body scaly.
    C. 9-16 rays in the ventral fins.
      D. An elongate bony plate on the throat between the two branches of the lower jaw. Fam. *Elopidae* (No. xxvi.).
      DD. No such bony plate. Fam. *Albulidae* (No. xxvii.).
    CC. Not more than 8 rays in the ventral fin.
      E. No lateral line.
        F. Dorsal fin posterior, opposite the anal. Fam. *Chirocentridae* (No. xxviii.).
        FF. Dorsal fin median, well before the anal.
          G. Maxilla very large, greatly produced backward. Fam. *Engraulidae* (No. xxix.).
          GG. Maxilla small or of moderate size, not produced unusually far backward. Fam. *Clupeidae* (No. xxx.).
      EE. Lateral line present.
H. Mouth terminal, no rostral barble, tail forked. Fam. *Chanidae* (No. xxxi.).
        HH. Mouth overhung by the snout, a rostral barble, tail emarginate. Fam. *Gonorhynchidae* (No. xxxii.).
  BB. Body naked. Fam. *Galaxiidae* (No. xxxiii.).

AA. A secondary adipose dorsal fin present posteriorly.
I. Dorsal fin opposite or before the ventrals.
J. Jaws with teeth, scales small, fluviatile. Fam. *Salmonidae* (No. xxxiv.).
JJ. Jaws toothless, scales large, marine. Fam. *Argentinidae* (No. xxxv.).
II. Dorsal fin behind the ventrals.
K. Dorsal before anal, 7 ventral rays. Fam. *Aplochitonidae* (No. xxxvi.).
KK. Dorsal opposite anal, 6 ventral rays.
Fam. *Retropinnidae* (No. xxxvii.).

XXVI. Family ELOPIDAE.

A. Dorsal and anal fins each with a basal scaly sheath; the dorsal longer than the anal, its last ray not produced. *Elops* (45).
AA. Dorsal and anal fins without scaly sheaths; the anal longer than the dorsal, its last ray produced. *Megalops* (46).

45. ELOPS Linn., Syst. Nat. 12th. ed., 1766, p. 518 (*saurus*).
45a. E. HAWAIENSIS. GIANT HERRING. *Id.* Regan, A.M.N.H. (8) iii, 1909, p. 39, *E. machnata* Richardson (*nec* Forskal), Ichth. Ereb. & Terr., 1846, p. 59, pl. 36, 3-5. (Pl. iv.).

A tropical species ranging southward to Port Jackson. Attains a length of about four feet, and is good eating.

46. MEGALOPS Lacep., H. N. Poiss. v, 1803, p. 289 (*filamentosus*).
46a. M. CYPRINOIDES. OX-EYED HERRING. *Clupea cyprinoides* Brouss., Ichth., 1782, pl. 9. *M. filamentosus* Bleeker, Atlas Ichth. vi, 1872, p. 86, pl. 273, I. (Pl. iv.).

A tropical estuarine species entering fresh water; occurs in the northern river estuaries.

XXVII. Family ALBULIDAE.

47. ALBULA (Gronow) Scopoli, Introd. Nat. Hist., 1777, p. 450—*vide* Jordan, Gen. Fish. I, 1917, p. 42 (*vulpes*).
47a. A. VULPES. LADY FISH. *Esox vulpes* Linn., Syst. Nat. 10th. ed., 1758, p. 313. *Conorhynchus glossodon* Bleeker, Atlas Ichth. vi, 1872, p. 83, pl. 270, I. (Pl. iv.).

Occurs in all tropical seas; only once recorded from New South Wales.

XXVIII. Family CHIROCENTRIDAE.

48. CHIROCENTRUS Cuvier, Reg. Anim. ii, 1817, p. 178 (*dorab*).
48a. C. DORAB. WOLF HERRING. *Clupea dorab* Forsk., Descr. Anim., 1775, p. 72; *Chirocentrus dorab* Bleeker, Atlas Ichth. vi, 1872, p. 92, pl. 271, 3. (Pl. iv.).

A giant tropical species reaching a length of twelve feet. Not satisfactorily recorded from New South Wales.

XXIX. Family ENGRAULIDAE.

49. ENGRAULIS Cuvier, R. Anim. ii, 1817, p. 174 (*encrasicolus*).
49a. E. AUSTRALIS. AUSTRALIAN ANCHOVY. *Atherina australis* Shaw, White's Voy N.S Wales, 1790, p. 296 and plate opposite. *E. australis* McCulloch, Rec. Austr. Mus. xiii. 2, 1920, p. 43, pl. 12, 1. (Pl. iv).

Occurs in enormous shoals off the coast. This species is very similar to the European Anchovy.

XXX. Family CLUPEIDAE.

A. Belly rounded, covered with ordinary scales.
B. Dorsal before the ventrals; eye entirely protected by a thick transparent membrane. *Etrumeus* (50).
BB. Dorsal opposite the ventrals; eye partly exposed. *Stolephorus* (51).
AA. Belly compressed, with a serrated edge of spiniform scales.
C. Median scales before the dorsal fin spiniform, forming a serrated edge as on the ventral profile.
D. Ventral before the dorsal; marine. *Hyperlophus* (52).
DD. Ventral below the dorsal; fluviatile. *Potamalosa* (53).
CC. No spiniform scales on the back.
E. Mouth terminal, larger, the jaws not forming a sharp angle at their symphyses; posterior dorsal ray not produced.
F. Operculum with several radiating grooves. *Sardinia* (54).
FF. Operculum with only one groove near its anterior margin. *Harengula* (55).
EE. Mouth subterminal, small; jaws forming a sharp angle at their symphyses; posterior dorsal ray produced. *Nematalosa* (56).

50. ETRUMEUS Bleeker, Verh. Bat. Gen. xxv., 1853, Japan, p. 48 (*micropus*).
50a. E. JACKSONIENSIS. MARAY. *Id.* Macleay, P.L.S. N.S.W. iii, 1878, p. 36, pl. 4, 1. *Id.* McCulloch, Rec. W. Austr. Mus. i. 3, 1914, p. 211, pl. 29. (Pl. iv.).
Apparently a southern species and not common in New South Wales waters.

51. STOLEPHORUS Lacep., H. N. Poiss. v, 1803, p. 381 (*japonicus*).
51a. S. ROBUSTUS. BLUE SPRAT. *Spratelloides robustus* Ogilby, P.L.S. N.S.W. xxii, 1897, p. 64. *S. robustus* McCulloch, Rec. Austr. Mus. xiii, 2, 1920, p. 42, pl. 11, 1. (Pl. iv.).
A small species growing to about 3 inches long, and occurring in shoals off the coast.

52. HYPERLOPHUS Ogilby, Rec. Austr. Mus. ii, 1892, p. 26 (*sprattellides*).
A. Anal fin commencing well behind the last dorsal ray. *vittatus* (52a).
AA. Anal fin commencing below the last dorsal ray. *translucidus* (52b).

52a H. VITTATUS. SANDY SPRAT. *Meletta vittata* Cast., Res. Fish. Austr., 1875, p. 46. *H. vittatus* McCulloch, Rec. Austr. Mus. xi., 1917, p. 163, pl. 29, 1-2. (Pl. iv.).
Very abundant on the coast, occurring in shoals, and growing to about five inches in length. An excellent food-fish.

52b. H. TRANSLUCIDUS. *Id.* McCulloch, Rec. Austr. Mus. xi. 7, 1917, p. 165, pl. 29, 3.
A small species known only from a few specimens.

53. POTAMALOSA Ogilby, P.L.S. N.S.W. xxi, 1897, p. 504 (*novae-hollandiae*).
53a. P. NOVAE-HOLLANDIAE. FRESH-WATER HERRING. ?*Meletta novae-hollandiae* Cuv. & Val., H. N. Poiss. xx, 1847, p. 376. *Clupea novae-hollandiae* Gthr., B. M. Cat. Fish. vii, 1868, p. 431. *P. novae-hollandiae* McCulloch, Rec. Austr. Mus. xi. 7, 1917, p. 166, pl. 29, 4. (Pl. v.).
Abundant in the coastal rivers and growing to 12 inches long. Small specimens are good eating, but the larger ones are very bony.

54. SARDINIA Poey, Memoirs Cuba ii, 1860, p. 311 (*pseudohispanica*).

54a. S. NEOPILCHARDUS. AUSTRALIAN PILCHARD. *Clupea neopilchardus* Stdr., Denk. Akad. Wiss. Wien xli. i, 1879, p. 12. *S. neopilchardus* McCulloch, Rec. Austr. Mus. xii. 8, 1919, p. 172, pl. 26, I. (Pl. v.).

Occurs in enormous shoals periodically. Length about 10 inches. This species is very similar to the European Pilchard or Sardine.

55. HARENGULA Cuv. & Val., H. N. Poiss. xx, 1847, p. 280 (*latulus*).

55a. H. CASTELNAUI. HERRING. *Kowala castelnaui* Ogilby, P.L.S. N.S.W. xxii., 1897, p. 66. *Sardinella castelnaui* Stead, Ed. Fish. N.S. Wales, 1908, p. 26, pl. 5. (Pl. v.).

Occurs in vast shoals at times. Length 9 inches.

56. NEMATALOSA Regan, A.M.N.H. (8) xix., 1917, p. 312.

A. Dorsal with 16-18 rays; a black shoulder spot usually present; marine. *come* (56a).
AA. Dorsal with 13-16 rays; no dark shoulder spot; fluviatile.
B. Body deeper. *erebi* (56b).
BB. Body more elongate. *horni* (56c).

56a. N COME HAIRBACK HERRING. *Chatoesus come* Rich., Ichth. Erebus & Terror, 1846, p. 62, pl. 38, 7-10. *Dorosoma nasus* Bleeker (*nec* Bloch), Atlas Ichth. vi, 1875, p. 142, pl. 260, 4. (Pl. v.).

The Australian species of *Nematalosa* occurring in the sea, which has been incorrectly recorded as *N. nasus*, is apparently referable to *N. come*. It is restricted to the northern portion of the New South Wales coast.

56b. N. EREBI. BONY BREAM. *Chatoessus erebi* Gthr., B.M. Cat. Fish. vii, 1868, p. 407.

Inhabits the fresh waters of the Murray River system. Length 13 inches.

56c. N. HORNI. *Chatoessus horni* Zietz, Rept. Horn. Exped. ii, 1896, p. 180, pl. 16, 6.

This is apparently merely a slender variety of the preceding species.

XXXI. Family CHANIDAE.

57. CHANOS Lacep., H. N. Poiss v, 1803, p. 395 (*arabicus*).

57a. C. CHANOS SALMON HERRING. *Mugil chanos* Forsk., Descr. Anim., 1775, p. 74. *Lutodeira salmonea* Rich., Ichth. Erebus & Terror, 1846, p. 58, pl. 36, 1-2. (Pl. v.).

A tropical species, not common in this State. Length to 4 feet.

XXXII. Family GONORHYNCHIDAE.

58. GONORHYNCHUS Cuvier, Reg. Anim. ii, 1817, p. 196 (*gonorynchus*).

58a. G. GREYI. SAND FISH. *Rhynchana greyi* Rich., Ichth. Erebus & Terror, 1845, p. 44, pl. 29, 1-6. (Pl. v.).

G. parvimanus Ogilby, Ann. Qld. Mus. 10, 1911, p. 34, is probably the young of *G. greyi*. Occasionally taken on sandy bottoms. Length 13 inches.

XXXIII. Family GALAXIIDÆ.

59. GALAXIAS Cuvier, R. Anim. ii., 1817, p. 183 (*truttaceus*).

A. Ventrals with 7 rays.
  B. Origin of anal opposite that of dorsal. *attenuatus* (59a).
  BB. Origin of anal behind that of dorsal.
    C. Anal origin below or before middle of dorsal.
      D. Lower jaw projecting beyond upper. *planiceps* (59b).
      DD. Jaws equal.
        E. Anal reaching to or almost to base of caudal when adpressed; pectoral reaching half its distance from ventral. *coxii* (59c).
        EE. Anal not nearly reaching the caudal base when adpressed; pectoral not reaching half its distance from the ventral. *bongbong* (59d).
    CC. Anal origin behind middle of dorsal. *findlayi* (59e).
AA. Ventrals with six rays. *dissimilis* (59f).

59a. G. ATTENUATUS JOLLYTAIL. *Mesites attenuatus* Jenyns, Zool. Beagle iii, Fish., 1842, p. 121, pl. 22, 5. *G. attenuatus* Regan, P.Z.S. 1905 (1906), p. 368, pls. 12, 1 and 13, 2. (Pl. v.).

A small fish about six inches long, occurring in fresh waters near the sea. The young are developed in the sea, but make their way into fresh water at an early stage. The young of this and other species form the New Zealand Whitebait.

59b. G. PLANICEPS. *Id.* Macleay, P.L.S. N.S.W. vi, 1881, p. 233. *G. waitii* Regan, P.Z.S. 1905 (1906), p. 376, pl. 11, 2.

A comparison of the types of *G. planiceps* with paratypes of *G. waitii* proves the two to be similar in all details.

59c. G. COXII. MOUNTAIN TROUT. *Id.* Macleay, P.L.S. N.S.W. v, 1880, p. 45. *Id.* Regan, P.Z.S. 1905 (1906), p. 380, pl. 12, 2. (Pl. v.).

Reaches a length of 7 inches.

59d. G. BONGBONG. *Id* Macleay, P.L.S. N.S.W. vi, 1881, p. 233.

59e. G. FINDLAYI. *Id.* Macleay P.L.S. N.S.W. vii, 1882, p. 107. *Id.* Regan, P.Z.S. 1905 (1906), p. 382, pl. 13, 3.

A small species ascending the streams to near the summit of Mt. Kosciusko.

59f. G. DISSIMILIS. *Id.* Regan, P.Z.S. 1905 (1906), p. 383.

The unique holotype of this species is perhaps merely an abnormal specimen.

[*G. scottii* (Krefft) Ogilby, Cat. Fish. N.S. Wales, 1886, p. 55, is a *nomen nudum*. *G. olidus* Gthr., has been incorrectly recorded from New South Wales by Ogilby, *op. cit.*, p. 54.]

XXXIV. Family SALMONIDÆ.

60. SALMO Linn., Syst. Nat. 10th ed., 1758, p. 308 (*salar*).

A. No red or pink lateral band from head to tail; spots larger and scattered. *fario* (60a).
AA. A red or pink lateral band from head to tail; spots smaller and close-set. *irideus* (60b).

60a. S. FARIO. BROWN TROUT. *Id.* Linn., Syst. Nat. 10th ed., 1758, p. 309; *Id.* Day, Fish. Gt. Brit. & Irel. ii, 1880-1884, p. 95, pl. 113, 1. (Pl. vii.).

Introduced into various streams in New South Wales, but with less success than the following species.

60b. S. IRIDEUS. RAINBOW TROUT. *Id.* Gibbons, P. Cal. Acad. Nat. Sci., 1855, p. 36; *Id.* Jord. & Evm., Fish. N. & Mid. Amer. i, 1896, p. 500, pl. 81, 216. (Pl. vii.).

Successfully acclimatised in many rivers in various parts of the State, and providing good sport for rod-fishermen.

Attempts have been made at different times to acclimatise the Loch Leven Trout (*Salmo levenensis*), the Salmon Trout (*S. trutta*), the American Brook Trout (*Salvelinus fontinalis*), and the Sockeye Salmon (*Oncorhynchus nerka*), but according to Mr H. K. Anderson, of the State Fisheries Department, none of these have thrived.

XXXV. Family ARGENTINIDAE.

61. ARGENTINA Linn., Syst. Nat. 10th ed., 1758, p. 315 (*sphyraena*).

61a. A. ELONGATA. *Id.* Hutton, A.M.N.H. (5) iii, 1879, p. 53. *Id.* Waite, Rec. Cantb. Mus. i, 1911, p. 161, pl. 24. (Pl. vi.).

A small deep water species, occasionally taken by trawlers.

XXXVI. Family APLOCHITONIDAE.

62. PROTOTROCTES Gthr., B.M. Cat. Fish. v, 1864, p. 382 (*maraena*).

62a. P. MARAENA. AUSTRALIAN GRAYLING. *Id.* Gthr., *Tom. cit. Id.* Waite, Rec. Austr. Mus. iv, 1902, p. 265, pl. 41. (Pl. vi.).

A Trout-like fish growing to 12 inches long, and sometimes occurring in shoals in some coastal streams.

XXXVII. Family RETROPINNIDAE.

63. RETROPINNA Gill, Proc. Acad. Philad. 1862, p. 14 (*retropinna*).

63a. R. SEMONI. AUSTRALIAN SMELT. *Prototroctes semoni* Weber, Zool. Forschr. Austr. v, 1895, p. 274. *R. semoni* McCulloch, Rec. Austr. Mus. xiii. 2, 1920, p. 49, pl. 11, 2-3. (Pl. vi.).

A minute fish, about 3 inches long, abundant in both the coastal and inland streams of the State Very closely allied to the New Zealand Whitebait.

Sergeant Baker, Cucumber Fish, and Saury. Order INIOMI.

Differing from the Order Isospondyli in having the shoulder-girdle incomplete, there being no mesocoracoid arch.

A. Body scaly; ventrals near the pectorals.
  B. Maxilla expanded posteriorly.
    C. A broad movable supramaxillary bone; dorsal fin long.
      Family *Aulopidae* (No. xxxviii.).
    CC. No movable supramaxillary bone; dorsal fin short.
      Family *Sudidae* (No. xxxix.).
  BB. Maxillary narrow posteriorly, without supramaxillaries.
    Family *Synodontidae* (No. xl.).
AA. Body naked; ventrals far behind the pectorals.
  Family *Alepisauridae* (No. xli.).

XXXVIII. Family AULOPIDAE.

64. AULOPUS Cuvier, Reg. Anim. ii, 1817, p. 170 (*filamentosus*).

64a. A. PURPUPISSATUS. SERGEANT BAKER. *Id.* Rich., Icon. Pisc., 1843, p. 5, pl. 2, 3. *Id.* McCoy, Prodr. Zool. Vict. dec. v, 1881, pls. 54-55. (Pl. vi.).

A brilliantly coloured fish, commonly captured along the coast. The male differs from the female in having the anterior dorsal rays prolonged. Length about 2 feet.

XXXIX. Family SUDIDAE.

65. CHLOROPHTHALMUS Bonap., Faun. Ital., Fasc. 138, 1840 (*agassizii*).

65a. C. NIGRIPINNIS. CUCUMBER FISH. *Id.* Gthr., A.M.N.H. (5) ii, 1878, p. 182, and Chall. Zool. xxii, 1887, p. 193, pl. 51, a. (Pl. vi.).

Plentiful in deep water where it is taken by trawlers. Length 10 inches.

XL. Family SYNODONTIDAE.

A. Eye-diameter longer than the snout and greater than the interorbital width. *Trachinocephalus* (66).

AA. Eye-diameter shorter than the snout and less than the interorbital width. *Saurida* (67).

66. TRACHINOCEPHALUS Gill, P. Acad. Philad. 1861, Suppl. p. 53 (*myops*).

66a. T. MYOPS. PAINTED SAURY. *Salmo myops* (Forst.) Bloch & Schn., Syst. Ichth., 1801, p. 421. *Synodus myops* Bleeker, Atlas Ichth. vi, 1875, p. 153, pl. 278, 3. (Pl. vi.).

An ornate tropical species, not common in this State.

67. SAURIDA Cuv. & Val., H.N. Poiss. xxii, 1849, p. 499 (*tumbil*).

A. 4½ scales between the dorsal fin and the lateral line; fins not spotted. *tumbil* (67a).

AA. 3½ scales between the dorsal fin and the lateral line; fins spotted. *gracilis* (67b).

67a. S. TUMBIL. SAURY. *Salmo tumbil* Bloch, Ichth. xii, 1795, p. 100, pl. 430. *Saurida tumbil* Blkr., Atlas. Ichth. vi, 1875, p. 155, pl. 277, 4. (Pl. vi.).

A tropical species, occasionally extending southward to Port Jackson.

67b. S. GRACILIS *Saurus gracilis* Quoy & Gaim., Zool. Uranie, 1824, p. 224. *Saurida nebulosa* Blkr., Atlas Ichth. vi, 1875, p. 156, pl. 277, 1

Rare in New South Wales waters.

XLI. Family ALEPISAURIDAE.

68. ALEPISAURUS Lowe, P.Z.S. 1833, p. 104 (*ferox*).

68a. A. FEROX. *Id.* Lowe, *Tom. cit.*, and Tr. Zool. Soc. i, 1834, p. 124, pls. 19 & 59. *Id.* Goode & Bean, U.S. Nat. Mus. Spec. Bull. ii, 1895, p. 117, pl. 38, 142. (Pl. vi.).

A rare oceanic fish reaching five feet in length.

Order OSTARIOPHYSI.

CARPS—Suborder CYPRINOIDEI.

Fresh water fishes with a single dorsal fin, which is armed with one serrated spine anteriorly.

XLII. Family CYPRINIDAE.

69. CARASSIUS Nilsson, Prodr. Ichth. Scandan. iv, 1832, p. 290 (*carassius*).

69a. C. CARASSIUS. CARP. *Cyprinus carassius* Linn., Syst. Nat. 10th ed., 1758, p. 321.

Since the introduction of this and the succeeding species into Australia, they have spread rapidly, and are now found in most of our fresh waters. They devour the eggs of other fishes, and as they are of no value as food-fishes, are to be regarded as pests.

69b. C. AURATUS. GOLD FISH. *Cyprinus auratus* Linn., Syst. Nat. 10th ed., 1758, p. 322. *Carassius auratus* Day, Fish. Gt. Brit. & Irel. ii, 1880-1884, p. 166, pl. cxxx, 2. (Pl. vii.).

This species is so variable as to be scarcely distinguishable from the Carp, though its scales are typically larger. Its colour varies from greenish-black to silver and red.

Other Cyprinoids said to have been introduced into New South Wales are the Tench, *Tinca tinca* Linn. (*vide* Ogilby, Cat. Fish. N.S. Wales, 1886, p. 53), the Roach, *Leuciscus rutilus* Linn (*vide* Stead, Fish Austr., 1906, p. 39), and a species of *Carpiodes* (*vide* Macleay, P.L.S. N.S.W. (2) iii, pp. 1507 & 1559).

CAT FISHES—Suborder SILUROIDEI.

Pectoral fins armed with spines.

A. Caudal pointed, united with the second dorsal and anal fins.
Family *Plotosidae* (No. xliii.).

AA. Caudal forked, quite distinct from the dorsal and anal fins.
Family *Ariidae* (No. xliv.).

XLIII. Family PLOTOSIDAE.

A. Ventrals below the anterior portion of the second dorsal; a dendritic anal appendage.
B. Gill-membranes meeting across, and narrowly united with the isthmus.
C. Axillary pore minute; premaxillary teeth numerous. *Plotosus* (70).
CC. Axillary pore larger; premaxillary teeth few. *Cnidoglanis* (71).
BB. Gill-membranes separated by a wide isthmus; axillary pore minute. *Euristhmus* (72).

AA. Ventrals in advance of the second dorsal; no dendritic anal appendage. *Tandanus* (73).

70. PLOTOSUS Lacep., H.N. Poiss. v, 1803, p. 129 (*anguillaris*).

70a. P. ANGUILLARIS. STRIPED CAT FISH. *Platystacus anguillaris* Bloch, Ichth. i, 1794, pl. 373, 3. *Plotosus arab* Bleeker, Atlas Ichth. ii, 1862, p. 98, pl. 95, 2. (Pl. vii.).

An ornate tropical marine species which is not common on this coast.

71. CNIDOGLANIS Gthr., Brit. Mus. Cat. Fish. v, 1864, p. 27 (*megastomus*).

71a. C. MEGASTOMUS. ESTUARY CAT FISH *Plotosus megastomus* Rich., Ichth. Erebus & Terror, 1845, p. 31, pl. 21, 1-3. (Pl. vii.).

Very common on muddy bottoms all along the coast, and growing to about three feet in length. Like all other members of the family, this species inflicts painful wounds with its spines.

72. EURISTHMUS Ogilby, P.L.S. N.S.W. xxiv, 1899, p. 154 (*elongatus*).

72a. E. LEPTURUS. LONG-TAILED CAT FISH. *Cnidoglanis lepturus* Gthr., Brit. Mus. Cat. Fish. v, 1864, p. 28. (Pl. vii).

73. TANDANUS Mitchell, Exp. Int. E. Austr. i, 1838, p. 95 (*tandanus*).

73a. T. TANDANUS. FRESH-WATER CAT FISH. *Id.* Mitchell, *Op. cit.*, p. 95, pl. 5, 2. *Id.* Roughley, Fish. Austr., 1916, p. 19, pl. 2. (Pl. vii.).

Reaches a length of over two feet, and occurs in all western waters and some coastal streams. It is a valuable food-fish, and it constructs a nest of pebbles to protect its eggs.

(*T. obscurus* Gthr., has been included in a N.S. Wales list on insufficient evidence—Ogilby, Cat Fish N.S. Wales, 1886, p. 50.)

XLIV. Family ARIIDAE.

A. Teeth of palate in three groups on each side, the hinder group extending backward. *Netuma* (74).

AA. Teeth of palate in two transverse groups on each side; no third group extending backward. *Hexanematichthys* (75).

74. NETUMA Blkr. Act. Soc. Sci. Indo-Neerl. iv, 1858, p. 62 (*nasuta*).

74a. N. THALASSINA. GIANT SALMON CATFISH. *Bagrus thalassinus* Ruppell, N.W. Fische, 1828, p. 75, pl. 20, 2. *N. thalassina* and *N. nasuta* Blkr., Atlas Ichth. ii, 1863, p. 28, pl. 61. (Pl. vii.).

A large tropical fish occurring in the estuaries of the northern rivers. It carries its eggs in its mouth until they hatch.

75. HEXANEMATICHTHYS Blkr., Act. Soc. Sci. Indo-Neerl. iv, 1858, p. 61 (*sundaicus*).

75a. H. AUSTRALIS SMALLER SALMON CATFISH. *Arius australis* Gthr., Proc. Zool. Soc. 1867, p. 103, fig.—head.

Grows to about 18 inches long, and occurs in the estuaries of the northern rivers.

Pigmy Eels. Order SYMBRANCHII.

Form Eel-like. Only one gill-opening, which is on the ventral surface.

XLV. Family CHEILOBRANCHIDAE.

76. CHEILOBRANCHUS Rich., Ichth. Erebus & Terror 1845, p. 50 (*dorsalis*).

76a. C. RUFUS. RED-BANDED PIGMY EEL or SHORE EEL. *Chilobranchus rufus* Macleay, P.L.S. N.S.W. vi, 1881, p. 266; *Id.* Waite, Rec. Austr. Mus. vi, 1906, p. 195, pl. 36, 1. (Pl. viii.).

A small fish, common just below low-tide mark. Length 4 inches.

76b. C. PARVULUS. *Cheilobranchus parvulus* McCulloch, Rec.Austr. Mus. vii, 1909, p. 316, fig. 18.

Plentiful in rock-pools on the coast, and reaching only 2 inches in length.

Eels.—Order APODES.

Form Eel-like. Two gill-openings which are lateral in position.

A. Body covered with minute scales. Family *Anguillidae* (No. xlvi.).
AA. Body naked.
B. Tip of tail surrounded by fin-membranes.
C. Posterior nostril superior or lateral.
D. Pectoral fin present.
E. Canine teeth on jaws and vomer.
Family *Muraenesocidae* (No. xlvii.).
EE. No canine teeth. Family *Leptocephalidae* (No. xlviii.).
DD. No pectoral fins. Family *Muraenidae* (No. xlix.).
CC. Posterior nostril in upper lip near the eye. Family *Echelidae* (No. l.).
BB. Tip of tail free, without fin-membranes. Family *Ophichthyidae* (No. li.).

XLVI. Family ANGUILLIDAE.

77. ANGUILLA Shaw, Gen. Zool. iv, 1803, p. 15 (*vulgaris*).

77a. A. AUSTRALIS. SHORT-FINNED EEL. *Id.* Rich., Proc. Zool. Soc. 1841, p. 22, and Ichth. Ereb. & Terr. 1848, p. 112, pl. 45, 1-5. (Pl. viii.).

Abundant in all coastal rivers and adjoining fresh waters, and descending to the sea to breed.

77b. A. REINHARDTII. LONG-FINNED EEL. *Id.* Stdr., S.B. Akad. Wiss. Wien lv. i, 1867, p. 15, fig. a-b.

Distinguished from the preceding species only by having the dorsal fin extending farther forward. Length to over 4 feet.

XLVII. Family MURAENESOCIDAE.

78. MURAENESOX McClelland, Calc. Journ. N. Hist. iv, 1843, p. 408 (*tricuspidata*).

78a. M. CINEREUS. SILVER EEL. *Muraena cinerea* Forsk., Descr. Anim., 1775, p. 22. *Muraenesox bagio* Blkr., Atlas Ichth., iv, 1864, p. 24, pl. 26, 2. (Pl. viii.).

A tropical species. Length to five feet.

XLVIII. Family LEPTOCEPHALIDAE.

A. Teeth of jaws juxtaposed to form a cutting edge. *Leptocephalus* (79).
AA. Jaw-teeth in bands, not forming a cutting edge. *Congermuraena* (80).

79. LEPTOCEPHALUS Gmelin, Syst. Nat. i. 3, 1789, p. 1150 (*morrisii*).

79a. L. LABIATUS. CONGER EEL. *Conger labiatus* Castelnau, P.L.S. N.S.W. iii, 1879, p. 396.

Scarcely distinguishable from the well known Conger of Europe. Length to 3 feet.

80. CONGERMURAENA Kaup, Cat. Apod. Fish., 1856, p. 108 (*balearica*).

80a. C. HABENATA. LITTLE CONGER EEL. *Congrus habenatus* Rich., Ichth. Ereb. & Terr., 1849, p. 109, pl. 50, 1-5. (Pl. viii.).

Apparently common in deeper water, and sometimes thrown up on beaches after storms. Length about 12 inches.

XLIX. Family MURAENIDAE.

A. Most of the teeth acute. *Gymnothorax* (81).
AA. Most of the teeth blunt. *Echidna* (82).

81. GYMNOTHORAX Bloch, Ichth. xii, 1797, p. 71 (*reticulatus*). The validity of this name is questionable.

A. Teeth present on the vomer.
B. Colouration almost uniform. *prasinus* (81a).
BB. Colouration variegated.
C. Brown with lighter undulous markings. *undulatus* (81b).
CC. Light with closely set darker spots. *pictus* (81c).
AA. No teeth on the vomer; body and fins with large light ocelli. *prionodon* (81d).

81a. G. PRASINUS GREEN EEL. *Muraena prasina* Rich., Ichth. Ereb. & Terr., 1847, p. 93.

Common among rocks along the coast. Colour bright green in life, changing to brown after death. Length to about 30 inches.

81b. G. UNDULATUS. *Muraenophis undulata* Lacep., H. N. Poiss. v, 1803, p. 629, pl. 5, 2. *Muraena cancellata* Rich., Ichth. Ereb. & Terr., 1847, p. 87, pl. 46, 1-5. (Pl. viii.).

A tropical species; its occurrence in these waters needs verification.

81c. G. PICTUS. *Muraena picta* Ahl, Mur. & Ophich. in Thunb., Dissert. iii, 1789, p. 6, pl. 2, 2. *G. pictus* Blkr., Atlas Ichth. iv, 1864, p. 87, pl. 170, 3-4. (Pl. viii.).

Another tropical species unreliably recorded from this State.

81d. G. PRIONODON. *Id.* Ogilby, P.L.S. N.S.W. (2) ix, 1895, p. 720.

The unique type of this species is 12 inches long; the occurrence of the species in these waters requires verification.

[*G. maculaepinnis* Blkr., and *G.* (*Poecilophis*) *unicolor* de la Roche, have been recorded from Port Jackson by Steindachner (Sitzb. Akad. Wiss. Wien liii, 1866, pp. 472-473), but neither species occurs in these waters.]

82. ECHIDNA Forster, Icones Ineditae, 1777, p. 181 (*variegata*).

82a. E. NEBULOSA. CLOUDED EEL. *Muraena nebulosa* Ahl, Mur. & Ophich. in Thunb., Dissert. iii, 1789, p. 5, pl. 50, 2; *Id.* Day, Fish. India, 1878, p. 673, pl. 172, 2. (Pl. viii.).

A tropical species; its occurrence in these waters needs verification.

L. Family ECHELIDAE.

A. Pectoral fins well developed. *Myrophis* (83).
AA. No pectoral fins. *Muraenichthys* (84).

83. MYROPHIS Lutken, Vid. Meddel. Nat. Foren. Kjobenhavn, 1851, p. 1 (*punctatus*).

83a. ? M. AUSTRALIS. *Id.* Castelnau, P.L.S. N.S.W. iii, 1879, p. 396.

Only one specimen of this species has been recorded. Its affinities are uncertain. Length 34 inches.

84. MURAENICHTHYS Blkr., Nat. Tijd. Ned. Ind. iv, 1853, p. 506 (*gymnopterus*).

84a. M. AUSTRALIS. WORM EEL. *Id.* Macleay, P.L.S. N.S.W. vi, 1881, p. 272. *Id.* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 20, fig. 6.

An uncommon species which is very slender, and less than 12 inches long.

LI Family OPHICHTHYIDAE.

A. Snout produced, beak-like; dorsal commencing behind pectorals. *Ophisurus* (85).
AA. Snout shorter; dorsal commencing before pectorals. *Bascanichthys* (86).

85. OPHISURUS Lacep., H. N. Poiss. ii, 1800, p. 195 (*serpens*).

85a. O. SERPENS. SNAKE EEL. *Muraena serpens* Linn., Syst. Nat. 10th ed., 1758, p. 244. *O. serpens* Schlegel, Faun. Japon., Pisces, 1850, p. 264, pl. 115, 1. (Pl. viii.).

Widely distributed, and reaching nearly 5 feet in length.

86. BASCANICHTHYS Jord. & Davis, Rep. U.S. Fish. Comm. 1888 (1892), p. 621 (*bascanium*)

86a. B. PINGUIS. *Ophichthys pinguis* Gthr., A.M.N.H. (4), x, 1872, p. 245, and Cruise Curacoa, 1873, p. 430, pl. 35. (Pl. viii.).

LARVAL EELS.

87. ATOPICHTHYS Garman, Mem. Mus. Comp. Zool. xxvi, p. 326.

87a. A.SP. GLASS EEL. *Leptocephalus* sp. Waite, P.L.S. N.S.W. (2) ix, 1894, p. 225 *Id.* Ogilby, P.L.S. N.S.W. xxii, 1897, pp. 158 and 161, fig.

These are small transparent fishes with minute heads and broad compressed bodies, which are merely the larval stages of eels of various families.

Pipe-fishes, Seahorses, and Bellows-fish.—Order SOLENICHTHYES.

Snout tubiform; body often encased in bony rings.

A. Ventral fins present; anal well developed, opposite the dorsal.
B. Jaws with minute teeth; body elongate.
C. Dorsal fin preceded by free spines. Family *Aulostomidae* (No. lii.)
CC. No dorsal spines. Family *Fistulariidae* (No. liii.)
BB. Jaws toothless; body deeper. Two dorsal fins, the first formed of strong spines. Family *Macrorhamphosidae* (No. liv.)
AA. No ventral fins; anal minute or absent. Family *Syngnathidae* (No. lv.)

LII. Family AULOSTOMIDAE.

88. AULOSTOMUS Lacep., H. N. Poiss., v, 1803, p. 356 (*chinensis*).

88a. A. CHINENSIS. PAINTED FLUTE-MOUTH. *Fistularia chinensis* Linn., Syst. Nat. 12th ed., i, I, 1766, p. 515. *A. chinense* Gthr., Fisch. Sudsee vii, 1881, p. 221, pl. 123, b-c. (Pl. ix.).

A tropical species. One specimen found on Maroubra beach, near Sydney, July, 1912.

LIII. Family FISTULARIIDAE.

89. FISTULARIA Linn., Syst. Nat. 10th ed., 1758, p. 312 (*tabacaria*).

A. Interorbital space concave; mediolateral ridges of snout parallel anteriorly. *petimba* (89a).
AA. Interorbital space almost flat; mediolateral ridges of snout expanding anteriorly to enclose an elongate-ovoid space. *depressa* (89b).

89a. F. PETIMBA. FLUTE-MOUTH. *Id.* Lacep., H. N. Poiss. v, 1803, p. 349. *F. serrata* Gthr., Chall. Zool. i, 1880, p. 68, pl. 32, c—snout; *Id.* Day, Fish., India, 1876, p. 360, pl. 76, 3 (Pl. ix).

Common in estuaries along the coast and reaching a length of about three feet. Colour dark green or brown.

89b. F. DEPRESSA. DEEP-SEA FLUTE-MOUTH. *Id.* Gthr., Chall. Zool. i, 1880, p. 69, pl. 32, d—snout.
Restricted to deeper water. Colour pinkish.

LIV. Family MACRORHAMPHOSIDAE.

90. MACRORHAMPHOSUS Lacep., H. N. Poiss. v, 1803, p. 136 (*cornutus*).

A. Depth more than half the head-length; dorsal spine over or a little before the vent. *elevatus* (90a).
AA. Depth less than half the head-length; dorsal spine well before the vent. *gracilis* (90b).

90a. M. ELEVATUS. BELLOWS FISH. *M. scolopax* var. *elevatus* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 59, pl. 7.1. (Pl. ix).
Plentiful in deep water and very variable in proportional details. Length 5½ inches.

90b. M. GRACILIS. LITTLE BELLOWS FISH. *Centriscus gracilis* Lowe, P.Z.S. 1839, p. 86. *M. gracilis* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 61, pl. 7, 2.
Widely distributed. Length 4 inches.

LV. Family SYNGNATHIDAE.

A. Caudal fin present though sometimes rudimentary.
B. Pectoral fin present.
C. Dorsal fin opposite or near the vent.
D. Dorsal edges of trunk and tail not continuous.
E. Operculum crossed by a horizontal ridge. *Corythoichthys* (91)
EE. Operculum without a horizontal ridge except anteriorly. *Syngnathus* (92).
DD. Dorsal edges of trunk and tail continuous. *Ichthyocampus* (93).
CC. Dorsal fin far behind the vent. *Urocampus* (94).
BB. No pectoral fins. *Nannocampus* (95).
AA. No caudal fin.
F. Body broader than deep.
G. Tail longer than head and trunk; snout slender. *Stigmatopora* (96).
GG. Tail shorter than head and trunk; snout broad. *Syngnathoides* (97).
FF. Body deeper than broad.
H. Dorsal largely or entirely behind the vent; axis of head at an oblique angle to that of body.
I. Shields of head, body, and tail with elongate processes bearing leaf-like appendages. *Phyllopteryx* (98).
II. Shields without such processes, prickly. *Solegnathus* (99).
HH. Dorsal largely before the vent; axis of head more or less at a right angle to that of the body. *Hippocampus* (100).

91. CORYTHOICHTHYS Kaup. Arch. Naturg. xix. i, 1853, p. 231 (*albirostris*).
Perhaps synonymous with *Hippichthys* Bleeker.

A. Snout shorter than postorbital portion of head. *parviceps* (91a).
AA. Snout longer than postorbital portion of head.
B. Dorsal entirely behind the vent. *altirostris* (91b).
BB. Vent below anterior portion of dorsal. *margaritifer* (91c).

91a. C. PARVICEPS. *Syngnathus parviceps* Ramsay and Ogilby, P.L.S.N.S.W. (2) i, 1886, p. 475.

91b. C. ALTIROSTRIS. *Syngnathus altirostris* Ogilby, Rec. Austr. Mus. i, 1890, p. 55.

91c. C. MARGARITIFER. *Syngnathus margaritifer* Peters, Mb. Akad. Berlin, 1868, p. 457.

92. SYNGNATHUS Linn., Syst. Nat. 10th ed., 1758, p. 336 (*acus*).

A. Snout as long as postorbital portion of head; a filament above each eye. *superciliaris* (92a).

AA. Snout longer than postorbital portion of head; no filament above the eye. *tigris* (92b).

92a. S. SUPERCILIARIS. *Id.* Gthr., Challenger Zool. i, 1880, p. 30.

92b. S. TIGRIS. PIPEFISH. *Id.* Castelnau, P.L.S.N.S.W. iii, 1879, p. 397. *Id.* McCulloch, Rec. W. Austr. Mus. i. 2, 1912, p. 83, pl. 11, 2 (Pl. ix). The largest of the genus occurring in New South Wales. Length 11 inches.

93. ICHTHYOCAMPUS Kaup, Arch. Naturg. xix. i, 1853, p. 231 (*belcheri*).

A. Snout much longer than postorbital portion of head. *cinctus* (93a).

AA. Snout much shorter than postorbital portion of head. *filum* (93b).

93a. I. CINCTUS. *Syngnathus cinctus* Ramsay, P.L.S.N.S.W., vii., 1882, p. 111.

93b. I. FILUM. *Id.* Gthr., Brit. Mus. Cat. Fish. viii, 1870, p. 178; *Id.* McCull., Rec. Austr. Mus. vii, 1909, p. 318, pl. 90, 1 (Pl. ix).

A diminutive species not uncommon in rock-pools on the coast. Length 3¾ inches.

94. UROCAMPUS Gthr., Brit. Mus. Cat. Fish. viii, 1870, p. 179 (*nanus*).

94a. U. CARINIROSTRIS. *Id.* Castelnau, P.Z.S. Viet. i, 1872, p. 201; *Id.* McCulloch, Rec. Austr. Mus. vii, 1909, p. 317, pl. 90, 2 (Pl. ix).

Common on Zostera flats in Port Jackson. Length about 4 inches.

95. NANNOCAMPUS Gthr., Brit. Mus. Cat. Fish. viii, 1870, p. 178 (*subosseus*.)

95a. N. RUBER. *Id.* Rams. and Ogilby, P.L.S.N.S.W. x, 1886, p. 757.

Known only from the typical specimen. Length 4½ inches.

96. STIGMATOPORA Kaup, Arch. Naturg. xix. i, 1853, p. 233 (*argus*).

A. Vent below or before middle of dorsal fin; D.48-55. *argus* (96a).

AA. Vent behind middle of dorsal fin; D.36-43. *nigra* (96b).

96a. S. ARGUS. SPOTTED PIPEFISH. *Syngnathus argus* Rich., Proc. Zool. Soc. 1840, p. 29, and Tr. Zool Soc. iii, 1849, p. 183, pl. 8, 2 (Pl. ix).

Very common in Sea-grass, and ornamented with small black white-edged ocelli on a green ground colour. Length 7 inches.

96b. S. NIGRA. *Id.* Kaup, Brit. Mus. Cat. Lophobr., 1856, p. 53; *Id.* McCulloch, Austr. Zool. i. 1, 1914, p. 29, fig. 1-3 (Pl. ix).

97. SYNGNATHOIDES Bleeker, Nat. Tijd. Ned. Ind. ii, 1851, p. 259 (*blochi*).

97a. S. BIACULEATUS. *Syngnathus biaculeatus* Bloch, Ausl. Fisch. iv, 1785, p. 10, pl. 121, 1-2. *Gastrotokeus biaculeatus* Day, Fish. India, 1878, p. 681, pl. 174, 5 (Pl. ix).

A tropical species. Length about 10 inches.

98. PHYLLOPTERYX Swainson, Nat. Hist. Fish. &c. ii, 1839, p. 332 (*foliatus*).

98a. P. FOLIATUS. LEAFY SEAHORSE. *Syngnathus foliatus* Shaw, Gen. Zool. v, 1804, p. 456, pl. 180. *P. foliatus* McCoy, Prodr. Zool. Viet. dec. vii, 1882, pl. 65, 1 (Pl. x).

An ornate species which is not uncommon, and is usually found washed up on beaches after storms. Length 16 inches.

99. SOLEGNATHUS Swainson, Nat. Hist. Fish. &c. ii, 1839, p. 333 (*hardwickii*).

A. Dorsal edges of body and tail continuous. *hardwickii* (99a).
AA. Mediolateral ridge of body continuous with the dorsal edge of the tail.
B. Scutes convex and intensely spiny. *spinosissimus* (99b).
BB. Scutes flatter, rugose, with one spine. *fasciatus* (99c).

99a. S. HARDWICKII. *Syngnathus hardwickii* Gray, Illustr. Ind. Zool., 1830, pl. 6, 3. *Solenognathus hardwickii* Waite, P.L.S.N.S.W. (2) ix, 1894, p. 221, pl. 17, 2-4-7.

A tropical species, not common in this State. Length 18 inches.

99b. S. SPINOSISSIMUS. SPINY SEAHORSE. *Id.* Gthr., Brit. Mus. Cat. Fish viii, 1870, p. 195; *Id.* Waite, P.L.S.N.S.W. (2) ix, 1894, p. 222, pl. 17, 5-8.

Not uncommonly washed up on coastal beaches after storms. Length 18 inches.

99c. S. FASCIATUS. *Id.* Gthr., Challenger Zool. i, 1880, p. 30, pl. 14, b (Pl. ix).

Perhaps synonymous with the preceding species.

100. HIPPOCAMPUS Rafinesque, Carrat. Gen. Spec. Sicilia, 1810, p. 18 (*hippocampus*).

A. Dorsal with 28-31 rays. *abdominalis* (100a).
AA. Dorsal with less than 21 rays.
B. Snout at least half as long as the head. *novae-hollanidae* (100b).
BB. Snout less than half the length of the head. *breviceps* (100c).

100a. H. ABDOMINALIS. SEAHORSE. *Id.* Lesson in Ferussac, Bull. Sci. Nat. xi, 1827, p. 127; *Id.* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 29, pl. 6, 1-2 (Pl. x).

Our largest species of the genus. Length about 10 inches when extended.

100b. H. NOVAE-HOLLANDIAE. SEAHORSE. *Id.* Steindachner, Sb. Akad. Wiss. Wien liii, 1866, p. 474, pl. 1, 2 (Fl. x).

Common among weeds in Port Jackson.

100c. H. BREVICEPS. SHORT-SNOUTED SEAHORSE. *Id.* Peters, Mb. Akad. Berlin 1869, p. 710; *Id.* McCoy, Prodr. Zool. Vict. dec. vi, 1882, pl. 55, 2.

Ogilby's record of this southern species from Port Jackson requires verification. No specimen from this State is in the Australian Museum.

Dragon Fishes—Order HYPOSTOMIDES.

Body encased in bony rings. Snout produced but not tubuliform.

LVI. Family PEGASIDAE.

A. Tail shorter, quadrangular posteriorly. *Pegasus* (101).
AA. Tail longer, flattened posteriorly. *Parapegasus* (102).

101. PEGASUS Linn., Syst. Nat. 10th ed., 1758, p. 338 (*volitans*).

101a. P. VOLITANS. DRAGON FISH. *Id.* Linn., *Op. cit.* *Zalises umitengu* Jord. & Snyder, P.U.S. Nat. Mus. xxiv, 1901, p. 2, pl. 1, 2 (Fl. x).

A single specimen from Port Jackson, having nine rays in each pectoral fin, has been called *P. pauciradiatus* by Ogilby. Length 2 inches.

102. PARAPEGASUS Dumeril, Hist. Nat. Poiss. ii, 1870, p. 492 (*natans*).

102a. P. NATANS. *Pegasus natans* Linn., Syst. Nat. 12th ed. i, 1766, p. 418. *Parapegasus natans* McCulloch, Biol. Res. Endeavour iii, 3, 1915, p. 110, fig. 2 (Pl. x).

Two specimens are in the Australian Museum from Lake Macquarie and Tuggerah Lakes. Length 5 inches.

Garfish, Flying Fish, and Long Tom.—Order SYNENTOGNATHI.

Fins without spines. Ventral fins abdominal. Lateral line forming a raised ridge along the lower surface of the body.

A. Dorsal and anal fins followed by several detached finlets; both jaws produced into a beak. Family *Scomberesocidae* (No. lvii).

AA. No detached finlets behind the dorsal and anal fins.

B. Both jaws produced into a long toothed beak. Family *Belonidae* (No. lviii).

BB. Jaws either equally short or only the lower jaw produced.

C. Jaws short, subequal; pectoral fins enlarged for flight. Family *Exocoetidae* (No. lix).

CC. Lower jaw more or less produced into a beak; pectoral fins usually short Family *Hemirhamphidae* (No. lx).

LVII. Family SCOMBERESOCIDAE.

103. SCOMBERESOX Lacep., H. N. Poiss. v, 1803, p. 344 (*camperi*).

103a. S. FORSTERI. BILL-FISH. *Id.* Cuv. & Val., H. N. Poiss. xviii, 1846, p. 481. *Scombresox saurus* var. *forsteri* McCoy, Prodr. Zool. Viet. dec. xiv, 1887, pl. 135, 2 (Pl. ix).

A pelagic species occasionally occurring in shoals. Length 15 inches.

LVIII. Family BELONIDAE.

A. Body little compressed, its breadth more than two-thirds its greatest depth. *Tylosurus* (104).

AA. Body much compressed, its breadth less than half its greatest depth. *Athlennes* (105).

104. TYLOSURUS Cocco, Giorn. Sci. Lett. Sicilia xlii No. 24, 1833, p. 18 (*cantrainii*).

A. Caudal peduncle as broad as deep.

B. Anal with 25-26 rays. *ferox* (104a).

BB. Anal with 19-21 rays. *macleayana* (104b).

AA. Caudal peduncle much deeper than broad. *krefftii* (104c).

104a. T. FEROX. SLENDER LONG TOM. *Belone ferox* Gthr., Brit. Mus. Cat. Fish. vi, 1866, p. 242. *T. ferox* Stead, Ed. Fish. N.S. Wales, 1908, p. 34, Pl. 10.

A very voracious species, common on the coast. Length 3 feet.

104b. T. MACLEAYANA. STOUT LONG TOM. *Belone macleayana* Ogilby, Cat. Fish. N.S. Wales, 1886, p. 53. *T. macleayana* Stead, Ed. Fish. N.S. Wales, 1908, p. 35, pl. 10 (Pl. ix).

Abundant in estuaries and coastal waters. Length to 4 feet.

104c. T. KREFFTII. *Belone krefftii* Gthr., Brit. Mus. Cat. Fish. vi, 1866, p. 250.

A little known species which has been recorded from this State on unreliable authority.

105. ATHLENNES Jordan & Fordyce, P.U.S. Nat. Mus. ix, 1886, p. 345 (*hians*).

105a. A. CAERULEOFASCIATUS. BARRED LONG TOM. *Tylosurus caeruleofasciatus* Stead, New Fish N.S. Wales (Fish. Dept. N.S. Wales), 1908, p. 3, pl. 1. *A. caeruleofasciatus* Ogilby, Mem. Qld. Mus. v, 1916, p. 130, pl. 14 (Pl. x).

Characterised by the compressed body which bears several dark vertical bars on the sides. Not common. Length 2 feet.

LIX. Family EXOCOETIDAE.

A. Ventral fins shorter, inserted nearer tip of snout than base of tail. *Exocoetus* (106).

AA. Ventral fins enlarged, inserted nearer base of tail than tip of snout. *Cypselurus* (107).

106. EXOCOETUS Linn., Syst. Nat. 10th ed., 1758, p. 316 (*volitans*).

106a. E. EVOLANS. FLYING FISH. *Id.* Linn., Syst. Nat. 12th. ed., 1766, p. 521; *Id.* Day, Fish India, 1877, p. 519, pl. 120, 5 (Pl. x).

Widely distributed over temperate and tropical seas. Length about 12 inches.

107. CYPSELURUS Swainson, Nat. Hist. Fish. &c., ii, 1839, p. 296 (*nuttalli*).

A. Anal fin commencing below dorsal origin.
B. Pectoral with a light median band. *speculiger* (107a).
BB. Pectoral without a light median band. *cribrosus* (107b).
AA. Anal fin commencing opposite middle of dorsal. *melanocercus* (107c).

107a. C. SPECULIGER. FLYING FISH. *Exocoetus speculiger* Cuv. & Val., Hist. Nat. Poiss. xix, 1846, p. 94. *C. speculiger* Jordan & Seale, Bull. U.S. Bur. Fish. xxv, 1906, p. 209, fig. 13.

107b. C. CRIBROSUS. FLYING FISH. *Exocetus unicolor vel cribrosa* Kner., Reise Novara, Zool. i, 1867, p. 325. *C. cribrosus* McCulloch, Mem. Qld. Mus. v, 1916, p. 59, pl. 7 (Pl. x).

Occasionally flies aboard ships on the coast. Length about 12 inches.

107c. C. MELANOCERCUS. LARGER FLYING FISH. *Exocoetus melanocercus* Ogilby, P.L.S.N.S.W. x, 1885, p. 123.

A rather rare species, only known from the coast near Sydney. Length 16 inches.

LX. Family HEMIRHAMPHIDAE.

A. Lower jaw produced into a long beak.
B. Pectoral fins short, body moderately compressed. *Hemirhamphus* (108).
BB. Pectoral fins long; body much compressed. *Euleptorhamphus* (109).
AA. Lower jaw forming only a short beak. *Arrhamphus* (110).

108. HEMIRHAMPHUS Cuvier, Regne Anim. ii, 1817, p. 186 (*brasiliensis*).

A. Origin of anal fin almost opposite that of the dorsal.
B. Ventral origin nearer the hypural joint than the gill-opening. *intermedius* (108a).

H. *australis* is apparently allied to H. *intermedius*.

BB. Ventral origin nearer the gill-opening than the hypural joint. *regularis* (108c).
AA. Origin of anal fin almost opposite the middle of the dorsal. *far* (108d).

108a. H. INTERMEDIUS. SEA GARFISH, BEAKIE. *Id.* Cantor, A.M.N.H. ix, 1842, p. 485; *Id.* McCoy, Prodr. Zool. Vict. dec. xiv, 1887, pl. 135, 1 (Pl. ix).

One of our most valuable food-fishes, occurring in schools. Length 18 inches.

108b. H. AUSTRALIS. *Id.* Steindachner, Sitzb., Akad. Wiss. Wien, liii, 1866, p 471.

This species has not been recognised since it was first described.

108c. H. REGULARIS. RIVER GARFISH. *Id.* Gthr., Brit. Mus. Cat. Fish. vi, 1866, p. 261; *Id.* Stead, Ed. Fish. N.S. Wales, 1908, p. 37, pl. 11.

An important food-fish, and one of the principal species of the fish markets. Abounds in coastal lakes, harbours and estuaries. Length 14 inches.

108d. H. FAR. BARRED GARFISH. *Esox far* Forsk., Deser. Anim., 1775, p. 67. *H. far* Day, Fish. India, 1877, p. 516, pl. 120, 3.

A northern species common at times. Length 15 inches.

H. gaimardii Cuv. & Val., H. N. Poiss. xix, 1846, p. 36, was said to have been taken in Port Jackson by Quoy and Gaimard, and *H. argenteus* Bennett, has been recorded from Sydney by Castelnau, P.L.S.N.S.W. iii, 1879, p. 394. The first is a tropical species, and its occurrence here needs verification. The second is a little known species, and no reliance can be placed upon Castelnau's identification.

109. EULEPTORHAMPHUS Gill, Proc. Acad. Nat. Sci. Philad., 1859, p. 156 (*brevoorti*).

109a. E. LONGIROSTRIS. *Long-beaked Garfish. Hemirhamphus longirostris* Cuvier, Regne Anim. 2nd ed. ii, 1829, p. 286; *Id.* Valenciennes, R. Anim. Illustr. Poiss., 1849, pl. 98, 2 (Pl. x).

Only once recorded from this State. A pelagic species. Length 18 inches.

110. ARRHAMPHUS Gthr., Brit. Mus. Cat. Fish. vi, 1866, p. 276 (*sclerolepis*).

110a. A. SCLEROLEPIS. SHORT-BEAKED GARFISH. *Id.* Gthr., *Tom. cit.*, p. 277. *Hemirhamphus krefftii* Steindachner, Sb. Akad. Wiss. Wien lvi. i, 1867, p. 332, pl. 1, 1-2 (Pl. x).

A northern species, abundant in the Richmond and Clarence estuaries. Length 15 inches.

Beardie and Rat-tails.—Order ANACANTHINI.

Vertical fins without true spines, though some anterior rays are often spiniform. Ventrals jugular, without spines.

A. Caudal fin well developed, distinct from the dorsal and anal fins; tail not greatly elongate. Family *Gadidae* (No. lxi).

AA. Caudal fin either absent or united with the dorsal and anal rays; tail very long, tapering posteriorly. Family *Coryphaenoididae* (lxii).

LXI. Family GADIDAE.

A. An outer row of strong teeth in each jaw followed by a narrow band of small ones; scales very small. *Lotella* (111).

AA. Teeth subequal in size, in bands; scales larger.

B. Premaxillary teeth in a single broad band on each side. *Physiculus* (112).

BB. Premaxillary teeth divided into two series on each side by a groove. *Austrophycis* (113).

111. Lotella Kaup, Arch. Naturg xxiv. i, 1858, p. 88 (*phycis*).

111a. L. callarias. Beardie. *Id.* Gthr., A.M.N.H. (3) xi, 1863, p. 116. *L. schuettei* Steindachner, Sb. Akad. Wiss. Wien liii, 1866, p. 466, pl. 3, 1 (Pl. xi).

Not uncommon near rocky reefs on the coast, and regarded as of some value as a food-fish. Length 20 inches.

L. fuliginosa Gthr., has been included in New South Wales lists on the very unreliable authority of Castelnau, who called it *rubiginosa*, but there is no reason to suppose the species occurs here.

112. Physiculus Kaup, Arch. Naturg. xxiv. i, 1858, p. 88 (*dalwigkii*).

A. Ventrals narrow at base; snout shorter than eye. *bachus* (112a).
AA. Ventrals broader at base; snout longer than eye. *barbatus* (112b).

112a. P. bachus. Red Cod. *Enchelyopus bachus* (Forster) Bloch & Schneider, Syst. Ichth. 1801, p. 53. *Lota breviuscula* Rich., Ichth. Erebus & Terror, 1846, p. 61, pl. 38, 1-2 (Pl. xi).

Rare in New South Wales. Length about 15 inches.

112b. P. barbatus. Rock Cod. *Pseudophycis barbatus* Gthr., A.M.N.H. (3) xi, 1863, p. 116; *Id.* McCoy, Prodr. Zool. Viet. dec. ii, 1878, pl. 20.

A southern species, extending into the waters of this State in the cooler months. Length 17 inches. I have examined the specimen figured by Stead, Ed. Fish. N.S. Wales, 1908, pl. 16, as *P. bachus*, and identify it as *P. barbatus;* it is from Merimbula.

113. Austrophycis Ogilby, P.L.S.N.S.W. xxii, 1897, p. 90 (*megalops*).

113a. A. megalops. *Id.* Ogilby, *Tom. cit.*, p. 91.

This species is only known from the typical example which is in a very imperfect state of preservation. Length 3 inches.

LXII Family Coryphaenoididae.

A. Dorsal spine serrated; 7 branchiostegal rays; snout obtuse. *Lionurus* (114).
AA. Dorsal spine smooth; 6 branchiostegal rays.
B. Snout produced, pointed; teeth small. *Coelorhynchus* (115).
BB. Snout short, obtuse; some premaxillary teeth enlarged. *Optonurus* (116).

114. Lionurus Gthr., Challenger Zool. xxii, 1887, pp. 124, 141 (*filicauda*).

114a. L. nigromaculatus. Rat-tail. *Macrourus nigromaculatus* McCulloch, Rec. Austr. Mus. vi. 5, 1907, p. 346, pl. 63, 1 (Pl. xi).

Four specimens dredged in deep water off Sydney. Length 9 inches.

115. Coelorhynchus Giorna, Mem. Acad. Sci. Torino xvi, 1805, p. 178 (*Coelorhynche la ville*).

A. Snout greatly produced, longer than the eye. *innotabilis* (115a).
AA. Snout shorter than the eye. *fasciatus* (115b).

115a. C. innotabilis. *Id.* McCulloch, Rec. Austr. Mus. vi. 5, 1907, p. 348, pl. 63, 2 (Pl. xi).

Known only from the typical specimens from deep water. Length 5½ inches.

115b. C. fasciatus. *Id.* Gthr., Challenger Zool. xxii, 1887, p. 129, pl. 28, a (Pl. xi).

Widely distributed in deep water between South America and Australia. Length 8 inches.

116. OPTONURUS Gthr., Challenger Zool. xxii, 1887, pp. 124, 147 (*denticulatus*).
116a. O. DENTICULATUS. *Macrourus denticulatus* Rich., Ichth. Erebus & Terror, 1846, p. 53, pl. 32, 1-3 (Pl. xi).
Inhabits deep water. Length 15 inches.

Nannygai, Knight Fish and John Dory.—Order BERYCOMORPHI.

A. Dorsal spines increasing in length backward, forming a single fin with the rays.
B. V.i/7, anal with 4 spines. Family *Berycidae* (No. lxiii).
BB. V.i/6, anal with 2-3 spines. Family *Trachichthyidae* (No. lxiv).
AA. Dorsal spines decreasing in length posteriorly, and forming a portion of the fin distinct from that of the rays.
C. Body enveloped in thick bony scutes; V.i/3.
Family *Monocentridae* (No. lxv).
CC. Body with small scales or naked; V.i/5—i/6.
Family *Zeidae* (No. lxvi).

LXIII. Family BERYCIDAE.

117. TRACHICHTHODES Gilchrist, Mar. Invest. S. Africa ii, 1903, p. 203 (*spinosus*).
117a. T. AFFINIS. NANNYGAI. *Beryx affinis* Gthr., Brit. Mus. Cat. Fish. i, 1859, p. 13. *Hoplopteryx affinis* Regan, A.M.N.H. (8) vii, 1911, p. 5, pl. 1 (Pl. xii).
Abundant in deep water off the coast, and often taken on lines around rocky reefs. Remarkable for its iridescent pink colouration. Length 18 inches.

LXIV. Family TRACHICHTHYIDAE.

A. Vent far behind the ventral fins.
B. Dorsal with 3, anal with 2 spines, the fins covered with asperities.
Trachichthys (118).
BB. Dorsal with 4-7, anal with 3 spines, the fins not covered with asperities.
Hoplostethus (119).
AA. Vent placed between the ventrals. *Paratrachichthys* (120).

118. TRACHICHTHYS Shaw & Nodder, Nat. Miscell. x, 1799, p. 378 (*australis*).
118a. T. AUSTRALIS. ROUGHY. *Id.* Shaw & Nodder, *Tom. cit. Id.* McCoy, Prodr. Zool. Viet. dec. xii, 1886, pl. 114 (Pl. xii).
A small rugose fish inhabiting rocky reefs. Length about 6 inches.

119. HOPLOSTETHUS Cuv. & Val. H. N. Poiss. iv, 1829, p. 469 (*mediterraneus*).
A. 4 dorsal spines; depth about 3 in the length. *elongatus* (119a).
AA. 6 dorsal spines; depth about 2 and 1 third in the length. *intermedius* (119b).

119a. H. ELONGATUS. *Trachichthys elongatus* Gthr., Brit. Mus. Cat. Fish. i, 1859, p. 10, and Challenger Zool. xxii, 1887, p. 22, pl. 5, c.
A very rare deep-water species. Length 5 inches.

119b. H. INTERMEDIUS. *Trachichthys intermedius* Hector, Tr. N. Zeal. Inst. vii, 1875, p. 245, pl. 11. *H. intermedius* McCulloch, Biol. Res. Endeavour ii. 3, 1914, p. 100, fig. 6 (Pl. xii).
An inhabitant of deep water. Length about 7 inches.

120. PARATRACHICHTHYS Waite, Mem. Austr. Mus. iv., 1, 1899, p. 64 (*trailli*).
120a. P. TRAILLI. SANDPAPER FISH. *Trachichthys trailli* Hutton, Tr. N. Zeal. Inst. viii, 1876, p. 212; *Id.* Gthr., Challenger Zool. xxii, 1887, p. 23, pl. 55, a (Pl. xii).
Common in deep water and often taken by trawlers. Length 10 inches.

LXV. Family MONOCENTRIDAE.

121. CLEIDOPUS De Vis, P.L.S.N.S.W. vii, 1882, p. 367 (*gloria-maris*).

This genus differs from *Monocentris* in having a patch of vomerine teeth, a luminous organ on each side of the mandible, and the suborbital linear instead of broad.

121a. C. GLORIA-MARIS. KNIGHT FISH. *Id.* De Vis, P.L.S.N.S.W. vii, 1882, p. 368. *Monocentris gloria-maris* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 67, pl. 8, 1-2 (Pl. xii).

Not uncommonly taken by trawlers on the coast, and characterised by the presence of "port and starboard lights" on its lower jaw. Length 9 inches.

LXVI. Family ZEIDAE.

A. Series of bony plates along the bases of the vertical fins.
B. 4 anal spines, scales evident. *Zeus* (122).
BB. 3 anal spines, body naked. *Zenopsis* (123).
AA. No series of bony plates at bases of vertical fins; body scaly. *Cyttus* (124).

122. ZEUS Linn., Syst. Nat. 10th ed. 1758, p. 266 (*faber*).

122a. Z. FABER. JOHN DORY. *Id.* Linn., *Tom. cit.*, p. 267; *Id.* Day, Fish. Gt. Brit. & Irel. i, 1880-1884, p. 138, pl. 48 (Pl. xii).

Common in deep water, and prized as a table fish. Length about 2 feet.

123. ZENOPSIS Gill, P.Ac.N.Sci. Philad. 1862, p. 126 (*nebulosus*).

123a. Z. NEBULOSUS. MIRROR DORY. *Zeus nebulosus* Schlegel, Faun. Japon. Pisces 1847, p. 123, pl. 66. *Zenopsis nebulosus* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 83, pl. 16, 1 (Pl. xii).

A deep water species taken by trawlers. Remarkable for its silver mirror-like body. Length 14 inches.

124. CYTTUS Gthr., Brit. Mus. Cat. Fish. ii, 1860, p. 396 (*australis*).

124a. C. AUSTRALIS. SILVER DORY. *Capros australis* Rich., Tr. Zool. Soc. iii. 1849, p. 72, and Ichth. Erebus & Terror, 1845, p. 137, pl. 59, 1-5 (Pl. xii).

Commonly taken by trawlers in moderate depths. Length 16 inches.

Ribbonfishes.—Order ALLOTRIOGNATHI.

A. Each ventral fin reduced to a single long filament. Family *Regalecidae* (lxvii).
AA. Each ventral fin either with several rays or wanting.
Family *Trachipteridae* (No. lxviii).

LXVII. Family REGALECIDAE.

125. REGALECUS Ascanius Icones rerum Nat. ii, 1772, p. 5 (*glesne*).

125a. R. GLESNE. RIBBON FISH, OAR FISH. *Id.* Ascanius, *Op. cit.* *Gymnetrus gladius* Valenciennes, R. Anim. Illustr. Poiss., 1843, p. 149, pl. 69 (Pl. xi).

A specimen 12 feet long was found on a beach in Port Jackson. This species reaches a length of over 20 feet and is believed to have given rise to several stories of the occurrence of Sea-serpents.

LXVIII. Family TRACHIPTERIDAE.

126. TRACHIPTERUS Gouan, Hist Pisc., 1770, p. 104 (*gouani*).

126a. T. JACKSONENSIS. RIBBON FISH. *Regalaecus jacksonensis* Ramsay, P.L.S.N.S.W. v, 1881, p. 631, pl. 20 (Pl. xi).

A very rare species, the type of which is 6 feet long. A young example about six inches long, which was picked up on a beach at Newcastle, has been called *T. jacksoniensis polystictus* by Ogilby, P.L.S.N.S.W. xxii, 1898, p. 649.

Flounders and Soles.—Order HETEROSOMATA.

Flat asymmetrical fishes, having both eyes on the one side, which is coloured, while the blind side is normally white.

A. Margin of the preoperculum free.
B. Eyes on the left side. Family *Bothidae* (No. lxix).
BB. Eyes on the right side. Family *Pleuronectidae* (No. lxx).
AA. Margin of the preoperculum not free.
C. Eyes on the right side. Family *Soleidae* (No. lxxi).
CC. Eyes on the left side. Family *Cynoglossidae* (No. lxxii).

LXIX. Family BOTHIDAE.

A. Ventral fins symmetrical and opposite one another on each side of the abdominal ridge. *Pseudorhombus* (127).
AA. Ventral fins unsymmetrical, the left largest and placed on the abdominal ridge.
B. Eyes separated by a narrow bony ridge.
C. Some anterior dorsal rays produced into filaments. *Lophonectes* (128).
CC. No anterior filamentous dorsal rays. *Laeops* (129).
BB. Eyes separated by a broad scaly interspace. *Platophrys* (130).

127. PSEUDORHOMBUS Bleeker, Versl. Akad. Amsterdam xiii, 1862, p. 426 (*polyspilos*).

A. Eye separated by a rather broad interspace from the dorsal profile which is not notched on the snout. *arsius* (127a).
AA. Only a narrow space separating the eye from the dorsal profile which is notched on the snout.
B. Scales of upper surface ctenoid. *multimaculatus* (127b).
BB. Scales of upper surface cycloid. *tenuirastrum* (127c).

127a. P. ARSIUS. LARGE-TOOTHED FLOUNDER. *Pleuronectes arsius* Buch., Fish. Ganges, 1822, p. 128. *P. russelli* Blkr., Atlas. Ichth. vi, 1870, p. 6, pl. 233, 2 (Pl. xiii).

One of the commonest of our Flat-fishes, and of fine edible quality. Length about 15 inches.

127b. P. MULTIMACULATUS. SMALL-TOOTHED FLOUNDER. *Id.* Gthr., Brit. Mus. Cat. Fish. iv, 1862, p. 427. *Id.* McCulloch, Biol. Res. Endeavour ii. 3, 1914, p. 131, pl. 24 (Pl. xiii).

Commonly confused with the preceding species. Length 16 inches.

127c. P. TENUIRASTRUM. DEEP-WATER FLOUNDER. *Paralichthys tenuirastrum* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 121, pl. 28.

Taken by trawlers in moderately deep water. Length 11 inches.

128. LOPHONECTES Gthr., Challenger Zool. i, 1880, p. 28 (*gallus*).

128a. L. GALLUS. CRESTED FLOUNDER. *Id.* Gthr., *Tom. cit.*, p. 29, pl. 15, b (Pl. xiii.)

Plentiful in deep water but of small size. Length about 8 inches.

129. LAEOPS Gthr., Challenger Zool. i, 1880, p. 29 (*parviceps*).
129a. L. PARVICEPS. *Id.* Gthr., *Tom. cit.*, pl. 15, a (Pl. xiii).
A rare species said to have been trawled off Twofold Bay in 120 fathoms.

130. PLATOPHRYS Swainson, Nat. Hist. Fish. &c. ii, 1839, p. 302 (*ocellatus*).
130a. P. SPINICEPS. *Rhomboidichthys spiniceps* Macleay, P.L.S.N.S.W. vi, 1881, p. 127.
Known only from the typical specimen. Length 4½ inches.

LXX. Family PLEURONECTIDAE.

A. Two ventral fins. *Ammotretis* (131).
AA. Only one ventral fin. *Rhombosolea* (132).

131. AMMOTRETIS Gthr., Brit. Mus. Cat. Fish. iv, 1862, p. 458 (*rostratus*).
131a. A. ROSTRATUS LONG-SNOUTED FLOUNDER. *Id.* Gthr., *Tom. cit. Peltorhamphus bassensis* Waite, Rec. Austr. Mus. vi, 1906, p. 198, pl. 34 (Pl. xiii).
A good food-fish abundant on the southern portion of the coast. Length 12 inches.

132. RHOMBOSOLEA Gthr., Brit. Mus. Cat. Fish. iv, 1862, p. 458 (*monopus*).
132a. R. FLESOIDES. SOUTHERN FLOUNDER. *Id.* Gthr., A.M.N.H. (3) xi, 1863, p. 117. *Id.* Waite, Rec. Austr. Mus. vi, 1906, p. 197, pl. 35 (Pl. xiii).
A southern species not often recognised in this State. Length 12 inches.
(*R. leporina* Gthr., has been incorrectly recorded from Sydney by Kner, Novara Zool. i, 1867, p. 287).

LXXI. Family SOLEIDAE.

A. Dorsal and anal fins united with the caudal. *Synaptura* (133).
AA. Caudal fin separate from the dorsal and anal.
B. Pectoral fin present. *Soleichthys* (134).
BB. No pectoral fins.
C. An open pore above the base of each dorsal and anal ray. *Pardachirus* (135).
CC. No pores above the bases of the dorsal and anal rays. *Aseraggodes* (136).

133. SYNAPTURA Cantor. Cat. Malay. Fish., 1850, p. 222 (Substitute name for *Brachirus* Swainson, which is regarded as preoccupied).
A. Pectoral fins well developed; colouration almost uniform. *nigra* (133a).
AA. Pectoral fins rudimentary; body with numerous dark cross-bars. *fasciata* (133b).

133a. S. NIGRA. BLACK SOLE. *Id.* Macleay, P.L.S.N.S.W. v, 1880, p. 49; *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 125, pl. 30.
Abundant in estuaries along the coast, and prized as a table fish. Length 14 inches.

133b. S. FASCIATA. MANY-BANDED SOLE. *Id.* Macleay, P.L.S.N.S.W. vii, 1882, p. 14; *Id.* McCulloch, Mem. Qld. Mus. v, 1916, p. 61, pl. 8, 2 (Pl. xiii).
Occurs in moderate depths Length 8 inches.
(*Æsopia quagga* Kaup, has been recorded from Port Jackson by Castelnau, P.L.S.N.S.W. iii, 1879, p. 392 and *Zebrias zebrinus* Tem. & Schlg., is included in a New South Wales list by Stead, Ed. Fish. N.S. Wales, 1908, p. 107. Both identifications are probably incorrect.)

134. SOLEICHTHYS Blkr., Act. Soc. Sci. Indo-Neerl. vi, 1859, p. 183 (*heterorhinos*).

134a. S. MICROCEPHALUS. SMALL-HEADED SOLE. *Solea microcephala* Gthr., Brit. Mus. Cat. Fish. iv, 1862, p. 466. *Id.* Roughley, Fish. Austr., 1916, p. 176, pl. 61 (Pl. xiii).

A small and uncommon species occurring in estuaries. Length 8 inches.

134b. S. LINEATUS. *Solea lineata* Ramsay, P.L.S.N.S.W. vii, 1883, p. 406.

This is perhaps the young of *S. microcephalus* though its colour-marking resembles that of *S. heterorhinos* Blkr., with which species I have previously united it (Mem. Qld. Mus. v, 1916, p. 60)

(*Microbuglossus humilis* Cantor, is erroneously recorded from Sydney by Kner, Novara Zool. i, 1867, p. 288).

135. PARDACHIRUS Gthr., Brit. Mus. Cat. Fish. iv, 1862, p. 478 (*marmoratus*).

135a. P. HEDLEYI. PEACOCK SOLE. *Id.* Ogilby, Mem. Qld. Mus. v, 1916, p. 144, pl. 17 (Pl. xiii).

A littoral and not uncommon species. Length 6 inches.

136. ASERAGGODES Kaup, Arch. Naturg. xxiv. i, 1858, p. 103 (*guttulatus*).

136a. A. MACLEAYANUS. NARROW-BANDED SOLE. *Solea macleayana* Ramsay, P.L.S.N.S.W. v. 4, 1881, p. 462. *A. macleayanus* Ogilby, Mem. Qld. Mus. v, 1916, p. 137, pl. 15 (Pl. xiii).

Not uncommon in depths down to 20 fathoms. Length 11 inches.

LXXII. Family CYNOGLOSSIDAE.

A. 2 lateral lines on left side, 1 on right. *Paraplagusia* (137).
AA. No lateral line. *Symphurus* (138).

137. PARAPLAGUSIA Blkr., Nat. Tijd. Dierk. ii, 1865, p. 274 (*bilineata*).

137a. P. UNICOLOR. TONGUE SOLE. *Plagusia unicolor* Macleay, P.L.S.N.S.W. vi, 1881, p. 138. *Symphurus unicolor* Stead, Ed. Fish. N.S. Wales, 1908, p. 107, pl. 74 (Pl. xiii).

Common on sandy bottoms in shallow depths. Length 13 inches..

138. SYMPHURUS Rafinesque, Indice Itiol. Sicil., 1810, p. 52 (*nigrescens*).

138a. S. AUSTRALIS. *S. strictus* var. *australis* McCulloch, Rec. Austr. Mus. vi. 5, 1907, p. 349, fig. 55.

Known only from the typical specimen, 5 inches long, which was dredged in deep water off Sydney.

Order PERCOMORPHI.

A large and varied group which includes about half the bony fishes of the State. The dorsal fin is preceded by a greater or smaller number of spines, and the ventral fins have never more than one spine and five rays.

Mullet, Hardyhead, and Sea Pike. Suborder PERCESOCES or MUGILOIDEA.

Two dorsal fins, the first formed of spines. Ventral fins abdominal. Opercles unarmed.

A. No lateral line; teeth small or wanting.
, B. Anal fin with 2-3 spines. Family *Mugilidae* (No. lxxiii).
BB. Anal fin with 1 spine. Family *Atherinidae* (No. lxxiv).
AA. Lateral line present; teeth very strong Family *Sphyraenidae* (No. lxxv).

LXXIII. Family MUGILIDAE.

A. No teeth on the palate. *Mugil* (139).
B. Eye with an adipose lid. Subg. *Mugil*.
BB. Eye without an adipose lid. Subg. *Liza*.
AA. Minute teeth present on vomer and palatines.
C. Jaws with teeth.
D. Teeth of upper jaw well developed, in a single row. *Myxus* (140).
DD. Teeth of upper jaw minute, in a narrow band. *Agonostomus* (141).
CC. Jaws toothless. *Trachystoma* (142).

139. MUGIL Linn., Syst. Nat. 10th ed., 1758, p. 316 (*cephalus*).

A. Eye partly covered by a transparent adipose lid. Subg. *Mugil*.
B. 8 anal rays; about 40 scales in a longitudinal row. *cephalus* (139a).
BB. 9 anal rays; 30-32 scales in a longitudinal row.
C. End of maxilla hidden by preorbital when mouth is closed; first dorsal spine not reaching half its distance from base of last dorsal ray. *georgii* (139b).
CC. End of maxilla exposed when mouth is closed; first dorsal spine reaching more than half its distance from base of last dorsal ray. *dussumierii* (139c).
AA. Eye naked, without a transparent adipose lid. Subg. *Liza*.
D. Less than 30 scales in a longitudinal row.
E. 8 anal rays. *waigiensis* (139d).
EE. 9 anal rays. *compressus* (139e).
DD. More than 30 scales in a longitudinal row; 10 anal rays.
F. No enlarged axillary scale; 35-38 scales in a row. *argenteus* (139f).
FF. An enlarged axillary scale; 39-40 scales in a row. *australis* (139g).

139a. M. CEPHALUS. SEA MULLET. *Id.* Linn., Syst. Nat. 10th ed., 1758, p. 316. *M. dobula* Gthr., Brit. Mus. Cat. Fish. iii, 1861, p. 420, and Fisch. Sudsee vi, 1877, p. 214, pl. 120, a (Pl. xiv).

Exceedingly abundant, and the commonest fish of the markets. Length, 30 inches. A comparison of local specimens with others from the Adriatic reveals nothing to distinguish the Australian representatives of this widely distributed species, which apparently ranges over all temperate and tropical seas. *M. hypselosoma* Ogilby, P.L.S.N.S.W. xxii, 1897, p. 74, is evidently based upon unusually deep examples of *M. cephalus*.

139b. M. GEORGII. SILVER MULLET. *Id.* Ogilby, P.L.S.N.S.W. xxii, 1897, p. 77.

A small species, plentiful in northern waters, and becoming rarer southwards. Length 10 inches.

139c. M. DUSSUMIERII. GREEN-BACKED MULLET. *Id.* Cuvier & Valenciennes, Hist. Nat. Poiss. xi, 1836, p. 147; *Id.* Day, Fish. India, 1876, p. 352, pl. 74, 4.

A tropical species, once recorded from the Clarence River estuary, but the specific identity of the specimens was not satisfactorily determined.

139d. M. WAIGIENSIS. DIAMOND-SCALED MULLET. *Id.* Quoy & Gaimard, Voy. Uranie, 1825, p. 337, pl. 59, 2; *Id.* Gthr., Fisch. Sudsee vi, 1877, p. 216, pl. 121, b (Pl. xiv).

A tropical species, recorded from the Clarence River estuary. Length 12 inches.

139e. M. COMPRESSUS. *Id.* Gthr., Brit. Mus. Cat. Fish. iii, 1861, p. 451, and Fisch. Sudsee vii, 1881, p. 217, pl. 123, a (Pl. xiv).

A tropical species, twice recorded from N.S. Wales waters, but further proof of its occurrence here is desirable. It is perhaps synonymous with *M. troschelii* Bleeker.

139f. M. ARGENTEUS. FLAT-TAILED MULLET. *Id.* Quoy & Gaimard, Voy. Uranie, 1825, p. 338, pl. 59, 3. *M. peronii* Stead, Ed. Fish. N.S. Wales, 1908, p. 42, pl. 13 (Pl. xiv).

An important food-fish, inhabiting the inlets along the coast. Length 18 inches.

139g. M. AUSTRALIS. *Id.* Steindachner, Denk. Akad. Wiss. Wien xli. i, 1879, p. 6.

A little known species which has not been recognised since it was first described.

(*M. longimanus* was included in a N.S. Wales list by Ogilby, Cat. Fish. N.S. Wales, 1886, p. 41, on the supposition that Steindachner had recorded it from Port Jackson; Waite also listed the species as *M. cunnesius*. But Steindachner's specimen came from Queensland, and the species is not known from New South Wales).

140. MYXUS Gthr., Brit. Mus. Cat. Fish. iii, 1861, p. 466 (*elongatus*).

140a. M. ELONGATUS. TALLEGALANE or SAND MULLET. *Id.* Gthr., *Tom. cit.*; *Id.* Waite, Tr. Roy. Soc. S. Austr., xl, 1916, p. 454, pl. xliv. (Pl xiv).

Abundant along the coast. Length 15 inches. *Mugil crenidens* Kner, Novara Zool. i, 1865, p. 229, pl. 9, 4, is apparently synonymous with this species.

141. AGONOSTOMUS Bennett, Proc. Zool. Soc. 1830 (1832), p. 116 (*telfairii*).

141a. A. FORSTERI. YELLOW-EYED MULLET. *Mugil forsteri* Cuvier & Valenciennes, H. N. Poiss. xi, 1836, p. 141. *Dajaus diemensis* Richardson, Ichth. Erebus & Terror, 1845, p. 37, pl. 26, 1-4 (Pl. xiv).

A southern species, plentiful only towards the Victorian border.

142. TRACHYSTOMA Ogilby, Proc. Zool. Soc. 1887, p. 614 (*multidens*).

142a. T. PETARDI. FRESH-WATER MULLET. *Mugil petardi* Castelnau, Res. Fish. Austr., 1875, p. 32. *M. breviceps* Steindachner (*nec.* Cuv. & Val.), Sitzb. Akad. Wiss. Wien liii, 1866, p. 459, pl. 1, 1 (Pl. xiv).

Common in the eastern rivers of the State north of Sydney. Length nearly 2 feet.

LXXIV. Family ATHERINIDAE.

A. Head and entire body scaly.
  B. Premaxillaries not expanded near the symphysis.
    C. Gill-rakers slender and numerous; vomer with teeth.
      D. Upper edge of each mandibular ramus expanded and elevated posteriorly *Atherina* (143).
      DD. Mandibular rami not expanded posteriorly. *Hepsetia* (144).
    CC. Gill-rakers rudimentary; palate toothless. *Craterocephalus* (145).
  BB. Premaxillaries expanded forward at the symphysis.
    E. Anal little longer than the second dorsal. *Pseudomugil* (147).
    EE. Anal much longer than the second dorsal. *Melanotaenia* (148).
AA Head and anterior portion of body naked. *Iso* (146).

143. ATHERINA Linn., Syst. Nat. 10th Ed., 1758, p. 315 (*hepsetus*).

A. Anal with ten rays. *microstoma* (143a).
AA. Anal with eighteen rays. *jacksoniana* (143b).

143a. A. MICROSTOMA. SILVERSIDE. *Id.* Gthr., Brit. Mus. Cat. Fish. iii, 1861, p. 401. *Taeniomembras microstoma* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 32, pl. 10, 2 (Pl. xv).

Specimens are in the Australian Museum from Eden, New South Wales. Length about 3 inches.

143b. A. JACKSONIANA. *Id.* Quoy & Gaimard, Voy. Uranie, 1825, p. 333.

The generic position of this species is uncertain. It has not been recognised since it was first described in 1825.

144. HEPSETIA Bonaparte, Fauna Italica, fasc. 91 (*boyeri*).

144a. H. PINGUIS. HARDYHEAD. *Atherina pinguis* Lacep., H.N. Poiss. v, 1803, p. 372, pl. 11, 1; *Id.* Ogilby, Mem. Qld. Mus. i, 1912, p. 38, pl. 12, 1 (Pl. xv).

Abundant, congregating in shoals. Length 6 inches.

145. CRATEROCEPHALUS McCulloch, P. Roy. Soc. Qld. xxiv, 1912, p. 48 (*fluviatilis*).

145a. C. FLUVIATILIS. FRESHWATER SILVERSIDE. *Id.* McCulloch, *Tom. cit.*, p. 49, pl. 1, 1 (Pl. xv).

Abundant in the streams of the Murray River system. Length about 3 inches.

146. Iso Jordan & Starks, Proc. U.S. Nat. Mus. xxiv, 1901, p. 205 (*flosmaris*).

146a. I. RHOTHOPHILUS. SURF FISH. *Tropidostethus rhothophilus* Ogilby, P.L.S.N.S.W. (2) x, 1895, p. 323; *Id.* Waite, Rec. Austr. Mus. v, 1904, p. 234, pl. 25, 2 (Pl. xv).

An aberrant atherine which lives in the surf near Sydney, and is sometimes very abundant. Length about 2 inches.

147. PSEUDOMUGIL Kner, Novara Zool. i, 1867, p. 275 (*signifer*).

147a. P. SIGNIFER. BLUE-EYE. *Id.* Kner, *Tom. cit.*, pl. 13, 5 (Pl. xv).

A minute fish, abundant in the coastal streams and waterholes and entering salt water. The male is very ornate with produced fin-rays. Length 2 inches.

148. MELANOTAENIA Gill, P. Ac. Nat. Sci. Philad. 1862, p. 280 (*nigrans*).

148a. M. NIGRANS. FRESH-WATER SUN-FISH. *Atherina nigrans* Richardson, A.M.N.H. xi, 1843, p. 180. *Strabo nigrofasciatus* Kner & Steindachner, Sitzb. Akad. Wiss. Wien liv, 1866, pp. 373, 395, pl. 3, 10 (Pl. xv).

An ornate and very variable fish which has been described under many generic and specific names. It is plentiful in the fresh waters of both eastern and western streams. Length about 4 inches.

LXXV. Family SPHYRAENIDAE.

149. SPHYRAENA Bloch & Schneider, Syst. Ichth., 1801, p. 109 (SPHYRAENA).

A. Ventrals inserted below the adpressed pectorals. *obtusata* (149a).
AA. Ventrals inserted behind the ends of the pectorals.
B. First dorsal spine behind that of the ventral. *novae-hollandiae* (149b).
BB. First dorsal spine before that of the ventral. *waitii* (149c).

149a. S. OBTUSATA. STRIPED SEA PIKE. *Id.* Cuvier & Valenciennes, Hist. Nat. Poiss. iii, 1829, p. 350; *Id.* Gthr., Fisch. Sudsee vi, 1877, p. 212, pl. 119, b (Pl. xiv.)

Not uncommon on the coast. Length about 16 inches. *S. grandisquamis* Steindachner, Sitzb. Akad. Wiss. Wien liii, 1866, p. 446, from Port Jackson, is apparently synonymous with *S. obtusata.*

149b. S. NOVAE-HOLLANDIAE. SHORT-FINNED SEA PIKE. *Id.* Gthr., Brit. Mus. Cat. Fish. ii, 1860, p. 335; *Id.* Ogilby, Ed. Fish. N.S. Wales, 1893, pl. 30 (Pl. xiv).

A southern species, but generally represented in the Sydney markets in small numbers. Length to 3 feet.

149c. S. WAITII. *Id.* Ogilby, Ann. Qld. Mus. No. 9, 1908, p. 29.

This species is perhaps merely the young of the preceding.

Threadfins. Suborder POLYNEMOIDEA.

Pectoral fins divided into two portions, the lower of which is composed of separate slender thread-like rays.

LXXVI. Family POLYNEMIDAE.

150. POLYNEMUS Linn., Syst. Nat. 10th ed., 1758, p. 317 (*paradiseus*).

A. 13-14 dorsal rays; free pectoral rays not reaching to the anal.
  B. 67 scales to hypural joint; depth of body much less than length of head; preopercular margin coarsely denticulate. *indicus* (150a).
  BB. 60 scales to hypural joint; depth of body equal to length of head; preopercular margin finely serrate. *plebeius* (150b).
AA. 12 dorsal rays; some free pectoral rays reaching the anal. *macrochir* (150c).

150a. P. INDICUS. THREADFIN. *Id.* Shaw, Gen. Zool. v, 1804, p. 155; *Id.* McClelland, Calc. Journ. Nat. Hist. iii, 1843, p. 179, pl. 6.

Recorded from Sydney by Gunther, but proof of the occurrence of this species in our waters is required. Length 4 feet.

150b. P. PLEBEIUS. *Id.* Broussonet, Ichth. Descr. et Icones, 1782, 8th plate. *Id.* Gthr., Fisch. Sudsee i, 1873-5, p. 103, pl. lxxvii, a.

A tropical species. One specimen in the Australian Museum from Port Stephens, collected by Fisheries Inspector Paton, May 1913. Length 14 inches.

150c. P. MACROCHIR. TASSEL FISH. *Id.* Gthr., A.M.N.H. (3) xx, 1867, p. 60.

An imperfectly described and little known species.

Suborder LABYRINTHICI or ANABANTOIDEA.

Families OPHIOCEPHALIDAE and ANABANTIDAE.

Ophiocephalus striatus Bloch, and *Polyacanthus cupanus* Cuv. & Val., have been incorrectly recorded from Sydney by Kner, Novara Zool. i, 1865, pp. 218 & 234. No members of the Suborder are known from Australia.

Suborder STROMATEOIDEA.

Oesophagus with lateral sacs which bear teeth.

A. Spinous dorsal shorter than soft portion; scales normal, not rugose; mandibular teeth not forming a cutting edge. Family *Stromateidae* (No. lxxvii).
AA. Spinous dorsal longer than soft portion; scales rugose; mandibular teeth compressed to form a cutting edge. Family *Tetragonuridae* (No. lxxviii).

LXXVII. Family STROMATEIDAE.

A. Spinous dorsal distinct from the soft portion though the two may be in contact.
  B. Spinous dorsal at least as high as the soft.
    C. Vomer and palatines with teeth. *Nomeus* (151).
    CC. Palate toothless. *Psenes* (152).
  BB. Dorsal spines shorter than the rays.
    D. Operculum covered with thick skin or naked. *Seriolella* (153).
    DD. Operculum covered with small scales. *Hyperoglyphe* (154).
AA. Spinous dorsal completely united with the soft portion, the two forming a single fin.
  E. Body elongate. *Centrolophus* (155).
  EE. Body ovate. *Schedophilus* (156).

151. NOMEUS Cuvier, Regne Anim. ii, 1817, p. 315 (*gronovii*).

151a. N. GRONOVII. PORTUGUESE MAN-O-WAR FISH. *Gobius gronovii* Gmelin, Syst. Nat. 13th ed., 1789, p. 1025. *N. gronovii* Goode & Bean, Oceanic Ichth., 1895 p. 220, pl. 63, 227 (Pl. xv).

This species secures protection from its enemies among the tentacles of the Physalia or Portuguese Man-o-war, to the stings of which it is perhaps immune. It is distributed throughout all temperate and tropical seas. Length 6 inches.

152. PSENES Cuvier & Valenciennes, Hist. Nat. Poiss. ix, 1833, p. 259 (*cyanophrys*).

A. D. x, i, 27-27; A. iii, 25-27. *cyanophrys* (152a).
AA. D. xi, i, 19; A. iii, 19. *whiteleggii* (152b).

152a. P. CYANOPHRYS. *Id.* Cuvier & Valenciennes, Hist. Nat. Poiss. ix, 1833, p. 260, pl. 265.

A rare species in our waters.

152b. P. WHITELEGGII. *Id.* Waite, P.L.S.N.S.W. (2) ix, 1894, p. 218, pl. 17, 1 (Pl. xvi).

A pelagic species, occasionally washed up on coastal beaches. Length about 2 inches.

153. SERIOLELLA Guichenot, in Gay, Hist. Chile, Zool. ii, 1848, p. 238 (*porosa*).

A. Pectoral reaching to vertical of anal origin; depth about 2.6 in length. *brama* (153a).
AA. Pectoral not nearly reaching vertical of anal origin; depth 3.3-4 in length. *punctata* (153b).

153a. S. BRAMA. SNOTGALL TREVALLA. *Neptomenus brama* Gthr., Brit. Mus. Cat. Fish. ii, 1860, p. 390. *S. brama* McCulloch, Zool. Res. Endeavour i, 1, 1911, p. 34, pl. 9, 1 (Pl. xvi).

A common southern species, but rare in New South Wales waters. Length 30 inches.

153b. S. PUNCTATA. MACKEREL TREVALLA. *Gasterosteus punctatus* (Forster) Bloch & Schneider, Syst. Ichth. 1801, p. 36. *S. punctata* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 316, pl. 10, 1 (Pl. xvi).

Rare in New South Wales, but common southwards. Length 12 inches.

154. HYPEROGLYPHE Gthr., Brit. Mus. Cat. Fish. i, 1859, p. 337 (*porosa*).

154a. H. POROSA. *Diagramma porosa* Richardson, Ichth. Erebus & Terror, 1845, p. 26, pl. 16, 5-6 (Pl. xvi).

The only record of this species in New South Wales waters is unreliable.

155. CENTROLOPHUS Lacépede, Hist. Nat. Poiss. iv, 1802, p. 441 (*niger*).

155a. C. MAORICUS. *Id.* Ogilby, Rec. Austr. Mus. ii. 5, 1893, p. 64; *Id.* McCulloch, Rec. Austr. Mus. xii. 8, 1919, p. 176, pl. 26, 2 (Pl. xvi).

A rare oceanic species recently recorded from our waters. Length 30 inches.

156. SCHEDOPHILUS Cocco, Innom. Messina Ann. iii, 1829, p. 57 (*medusophagus*).

156a. S. MACULATUS. RAFT FISH. *Id.* Guthr., Brit. Mus. Cat. Fish. ii, 1860, p. 412; *Id.* Waite, Rec. Austr. Mus. v, 1904, p. 163, pl. 20, 1 (Pl. xvi).

A pelagic species which is sometimes cast up on ocean beaches. Length 4 inches.

LXXVIII. Family TETRAGONURIDAE.

157. TETRAGONURUS Risso, Ichth. Nice, 1810, p. 347 (*cuvieri*).

157a. T. CUVIERI. SQUARE-TAIL. *Id.* Risso, *Op. cit.* *Id.* Valenciennes, Illust. Poiss. Regne Anim., 1837, p. 166, pl. 76, 2 (Pl. xv).

A widely distributed oceanic species, only once recorded from the New South Wales coast.

PERCH-LIKE FISHES—Suborder PERCOIDEA.

Not more than six rays in the ventral fins. Second suborbital bone not forming a stay for the preoperculum.

Key to the subdivisions, based upon Regan's classification of the Suborder (A.M.N.H. (8) xii, 1913, p. 111).

A. Ventrals with 1 spine and 4-5 rays.
  B. Lower pharyngeals not ankylosed.
    C. Two nostrils on each side.
      D. 23 or more vertebrae; 1-2 pectoral radials inserted on the hypocoracoid; gill-openings wide.
        E. Anal fin preceded by 2-3 pungent spines.
          F. Lower pectoral rays branched, not specially thickened. *Perciformes.*
          FF. Lower pectoral rays simple and thickened. *Cirrhitiformes.*
        EE. Anal spines if present weak and not more than two in number.
          G. 3 pectoral radials on the hypocoracoid; base of pectoral fin oblique. *Champsodontiformes.*
          GG. 2 pectoral radials on the hypocoracoid; base of pectoral fin vertical. *Trachiniformes.*
      DD. 21 vertebrae; 3 pectoral radials inserted on the hypocoracoid; gill-openings reduced to small openings above the end of the operculum in Australian species. *Callionymiformes.*
    CC. A single nostril on each side. *Nototheniiformes.*
  BB. Lower pharyngeals ankylosed to form a single bone.
    H. A single nostril on each side. *Pomacentriformes.*
    HH. 2 nostrils on each side. *Labriformes.*
AA. Ventrals with 1 spine and 1 ray. *Gadopsiformes.*

LXXIX. Family Serranidae.

A. Teeth present on the vomer, and usually on the palatines also.
  B. Jaws with fixed canines; marine.
    C. Lateral line extending along the caudal peduncle near its upper surface. *Callanthias* (158).

CC. Lateral line extending along the middle of each side of the caudal peduncle.
D. A large patch of teeth on the tongue. *Caprodon* (159).
DD. Tongue toothless.
E. Maxilla and mandible covered with rather large scales.
F. Dorsal with 19-23 rays; anal with 9-10. *Caesioperca* (160).
FF. Dorsal with 14-18 rays; anal with 6-8. *Anthias* (161).
EE. Maxilla and mandible either naked or with imperfect scales.
G. Scales small, many more than 4 between lateral line and middle of back.
H. Some inner teeth of jaws hinged and depressible; 9-12 dorsal spines. *Epinephelus* (162).
HH. Inner jaw teeth not depressible; 13 dorsal spines. *Acanthistius* (163).
GG. Scales larger, about 4 between lateral line and middle of back.
I. Scales of lateral line scarcely different from the others *Gilbertia* (164).
II. Scales of lateral line differentiated with ridges and crenulate edges. *Hypoplectrodes* (165).
BB. No canines, teeth villiform or the outer ones slightly enlarged; fluviatile or estuarine.
J. A well developed patch of teeth on each palatine.
K. Mucous cavities of head inconspicuous.
L. Ventrals inserted before pectorals, scales small. *Oligorus* (166).
LL. Ventrals inserted behind pectorals, scales large. *Percalates* (167).
KK. Mucous cavities of head conspicuous. *Plectroptites* (168).
JJ. Palatines toothless or with a few teeth. *Macquaria* (169).
AA. Vomer toothless or with a very few teeth; palatines toothless.
M. Gill-membranes united across the isthmus.
N. Teeth not trilobate. *Therapon* (170).
NN. Teeth trilobate. *Helotes* (171)
MM. Gill-membranes separated by and attached to the isthmus. *Pelates* (172).

158. CALLANTHIAS Lowe, P. Zool. Soc. Lond., 1839, p. 76 (*paradiseus*).

158a. C. ALLPORTI. ALLPORTS PERCH. *Id.* Gthr., A.M.N.H. (4) xvii, 1876, p. 390; *Id.* Boulenger, Brit. Mus. Cat. Fish. i, 1895, p. 335, pl. 15 (Pl. xvii).

A brilliantly coloured fish which is commonly taken by the trawlers in deep water. Length 12 inches.

159. CAPRODON Temm. & Schlegel, Faun. Japonica, Pisces, 1844, p. 64 (*schlegeli*).

159a. C. LONGIMANUS. LONG-FINNED PERCH. *Anthias longimanus* Gthr., Brit. Mus. Cat. Fish. i, 1859, p. 94. *C. longimanus* Boulenger, Brit. Mus. Cat. Fish. i, 1895, p. 315, pl. 12 (Pl. xvii).

A rare species occasionally captured in deep water. Length 16 inches.

160. CAESIOPERCA Castelnau, P. Zool. Soc. Viet. i, 1872, p. 49 (*rasor*).

160a. C. LEPIDOPTERA. RED PERCH. *Epinephelus lepidopterus* (Forster) Bloch & Schneider, Syst. Ichth., 1801, p. 302. *C. lepidoptera* Waite, Prelim. Rept. Thetis Exped., 1898, p. 31, pl. 1 (Pl. xvii).

Abundant in moderate depths where it is taken by the trawlers. Length 12 inches.

161. ANTHIAS Bloch, Ausl. Fische vi, 1792, p. 97 (*sacer*).

161a. A. PULCHELLUS. ORANGE PERCH. *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 77, pl. 12 (Pl. xvii).

Not uncommonly taken by the trawlers. Length 11 inches.

162. EPINEPHELUS Bloch, Ausl. Fische vii, 1793, p. 14 (*marginalis*).

A. Anal fin with 8 rays; crossbands, if present, oblique.
B. Caudal fin rounded.
C. Lower opercular spine below or behind the vertical of the upper one.
D. Body without large dark spots.
E. Body with six more or less distinct oblique cross-bars. *damelii* 162a).
EE. Body with narrow longitudinal undulating lines. *undulatostriatus* (162b).
D. Body with large dark spots.
F. Dark spots broader than the spaces between them. *merra* (162c).
FF. Dark spots smaller than the spaces between them. *tauvina* (162d).
CC. Lower opercular spine before the vertical of the upper one.
G. L. lat. 110-145, tubules not branched. *fuscoguttatus* (162e).
GG. L. lat. 100-110, tubules branched. *lanceolatus* (162f).
BB. Caudal fin truncate. *flavocaeruleus* (162g).
AA. Anal fin with 9 rays; body with 7 vertical dark cross-bands. *septemfasciatus* (162h).

162a. E. DAMELLI. BLACK ROCK COD. *Serranus damelii* Gthr., A.M.N.H. (4), xvii, 1873, p. 391. *E. daemelii* Boulenger, Brit. Mus. Cat. Fish. i, 1895, p. 223, pl. 7 (Pl. xvii).

Inhabits rocky reefs and preys upon smaller fishes and crustaceans. A valuable food-fish, growing to over four feet in length.

162b. E. UNDULATOSTRIATUS. RED-SPECKLED ROCK COD. *Serranus undulatostriatus* Peters, Monatsb. Akad. Berlin, 1866, p. 518. *Serranus guttulatus* Macleay, P.L.S.N.S.W. iii, 1878, p. 33, pl. 2.

Not very common. Length about 14 inches.

162c. E. MERRA. *Id.* Bloch, Ausl. Fische vii, 1793, p. 17, pl. 329. *Serranus hexagonatus* Gthr., Fische Sudsee i, 1873, p. 7, pl. 7.

A common tropical species, unreliably recorded from Port Jackson by Castelnau.

162d. E. TAUVINA. BROWN-SPOTTED ROCK COD. *Perca tauvina* Forskal, Descr. Anim., 1775, p. 39. *E. tauvina*, Stead, Ed. Fish. N.S. Wales, 1908, p. 58, pl. 27.

A tropical species, occurring in the northern waters of the State. Length 4 feet.

162e. E. FUSCOGUTTATUS. *Perca summana* var. *fuscoguttata* Forskal, Descr. Anim., 1775, p. 42. *E. fuscoguttatus* Bleeker, Atlas Ichth. vii, 1876, p. 57, pl. 307, 3.

A tropical species, said to have been taken in Port Jackson.

162f. E. LANCEOLATUS. QUEENSLAND GROPER. *Holocentrus lanceolatus* Bloch, Ausl. Fische. iv, 1790, p. 92, pl. 242, 1. *E. lanceolatus* Bleeker, Atlas. Ichth. vii, 1876, p. 49, pl. 332, 3 (Pl. xvii).

A giant species, reaching 6 feet in length, which is captured in the estuaries of our northern rivers. It has been incorrectly identified as *Promicrops itiara* in other lists. The young are brilliantly ornamented with black and yellow, but the adults are uniformly dark in colour.

162g. E. FLAVOCAERULAEUS Lacepede, var. *hoedtii* Bleeker. *Serranus hoedtii* Bleeker, Nat. Tijd. Ned. Ind. viii, 1855, p. 406, and Atlas Ichth. vii, 1876, p. 45, pl. 283, 2 (Pl. xvii).

A specimen received from the Fisheries Department was taken in the Clarence River estuary.

162h. E. SEPTEMFASCIATUS. GREY-BANDED ROCK COD. *Perca 7-fasciata* Thunberg, Vetensk. Acad. Handl. Stockholm xiv, 1793, p. 56, pl. 1. *Plectropoma susuki* Schlegel, Faun. Japonica, Pisces, 1842, p. 11, pl. 4, 1.

A rather rare species occurring in deeper water. Length about 12 inches.

163. ACANTHISTIUS Gill, P. Acad. N. Sci. Philad., 1862, p. 236 (*serratus*).

163a. A. SERRATUS. *Wirrah*. *Plectropoma serratum* Cuv. & Val., H.N. Poiss. ii, 1828, p. 399; *Id.* Quoy & Gaimard, Voy. Astrolabe, Zool. iii, 1835, p. 662, pl. 2, 1 (Pl. xvii).

Similar to the Rock Cods in appearance but of inferior edible quality. Lives among rocks, and grows to 20 inches long.

164. GILBERTIA Jordan & Eigenmann, Bull. U.S. Fish. Comm. viii, 1890, p. 346 (*semicinctum*).

A. Cross-bands descending to lower half of body. *annulata* (164a).
AA. Cross-bands confined to upper half of body.
B. Reddish, with 6-7 oblique cross-bars on upper half. *semicincta* (164b).
BB. Brownish, variegated with darker markings on the sides. *jamesoni* (164c).

164a. G. ANNULATA. BANDED SEA PERCH. *Plectropoma annulatum* Gunther, Brit. Mus. Cat. Fish. i, 1859, p. 158, and Cruise Curacoa, 1873, p. 415, pl. 28, b (Pl. xviii).

A rather uncommon species reaching a length of 10 inches.

164b. G. SEMICINCTA. HALF-BANDED SEA PERCH. *Plectropoma semicinctum* Cuvier & Valenciennes, Hist. Nat. Poiss. ix, 1833, p. 442. *Plectropoma hunti* Hector, Tr. N. Zeal. Inst. vii, 1875, p. 240, pl. 10, 1.

A small fish, not uncommon among rocks along the coast. Length 8 inches.

164c. G. JAMESONI. *Hypoplectrodes jamesoni* Ogilby, Proc. Roy. Soc. Qld. xxi, 1908, p. 16. *H. jamesoni* McCulloch, Rec. Austr. Mus. ix, 1913, p. 359, pl. 13, 1 (Pl. xviii).

Rare in New South Wales. Length 4 inches.

165. HYPOPLECTRODES Gill, P. Acad. Nat. Sci. Philad., 1862, p. 236 (*nigrorubrum*).

165a. H. NIGRORUBRUM. *Plectropoma nigrorubrum* Cuv. & Val., H.N. Poiss. ii, 1828, p. 402; *Id.* Quoy & Gaimard, Voy. Astrolabe, Zool. iii, 1835, p. 659, pl. 4, 1 (Pl. xviii).

A rather uncommon species inhabiting rocky localities. Length 10 inches.

166. OLIGORUS Gunther, Brit. Mus. Cat. Fish. i, 1859, p. 251 (*macquariensis*).

166a. O. MACQUARIENSIS. MURRAY COD. *Grystes macquariensis* Cuv. & Val., H.N. Poiss. iii, 1829, p. 58. *O. macquariensis* McCoy, Prodr. Zool. Viet. Dec. ix, 1884, pl. 85-86 (Pl. xviii).

A most valuable foodfish, inhabiting the Murray River system and the head waters of some northern streams. It varies considerably in form and colour-marking, and one variety with trout-like markings and an overhanging upper jaw has been regarded as a distinct species under the name of Trout Cod, *Oligorus mitchelli* Castelnau. Length to 5 feet.

167. PERCALATES Ramsay & Ogilby, P.L.S.N.S.W. (2) ii, 1887, p. 182 (*colonorum*).

167a. P. COLONORUM. AUSTRALIAN PERCH. *Lates colonorum* Gthr., A.M.N.H. (3) xi, 1863, p. 114. *Dules novemaculeatus* Steindachner, Sitzb. Akad. Wiss. Wien liii.i, 1866, p. 5, pl. 2, 1 (Pl. xviii).

Another important food-fish, inhabiting the coastal rivers and descending to the salt-water estuaries. Its variations in form and colour have led to the supposition that there is more than one species, but deeper bodied estuarine specimens are linked up with the more slender fresh-water examples by a chain of intermediate forms. Length 20 inches.

168. PLECTROPLITES Gill, P. Ac. Nat. Sci. Philad., 1862, p. 236 (*ambiguus*).

168a. P. AMBIGUUS. GOLDEN PERCH. *Datnia ambiguua* Richardson, Ichth. Erebus & Terror, 1845, p. 25, pl. 19. *Ctenolates ambiguus* McCoy, Prodr. Zool. Viet. Dec. ix, 1884, pl. 84 (Pl. xviii).

Another very valuable food-fish, occurring abundantly in the western river system. Length 2 feet.

169. MACQUARIA Cuv. & Val., H.N. Poiss. v, 1830, p. 377 (*australasica*).

169a. M. AUSTRALASICA. MACQUARIE PERCH. *Id.* Cuv. and Val., *Tom. cit.*, pl. 131; *Id.* Lesson, Voy. Coquille, Zool. ii, 1826, p. 194, pl. 14, 1 (Pl. xviii).

Abundant in some western waters, and occurring in a few coastal streams also. Length 15 inches.

170. THERAPON Cuvier (*Terapon* in error), Reg. Anim. ii, 1817, p. 295 (*servus*).

A. Lower opercular spine produced beyond opercular lobe; a dark blotch on the spinous dorsal. *servus* (170a).

AA. Lower opercular spine not produced beyond opercular lobe; no dark blotch on the spinous dorsal.

B. Suprascapular bone not exposed, hidden by scales. *unicolor* (170b).

BB. Suprascapular bone exposed, not hidden by scales. *bidyana* (170c).

170a. T. SERVUS. *Holocentrus servus* Bloch, Ausl. Fische iv, 1790, p. 80, pl. 238, 1; *T. jarbua* Day, Fish. India, 1875, p. 69, pl. 18, 4 (Pl. xix).

A tropical marine species occasionally wandering into New South Wales waters. Length 8 inches.

170b. T. UNICOLOR. SPANGLED GRUNTER. *Id.* Gunther, Brit. Mus. Cat. Fish. i, 1859, p. 277; *Id.* Ogil. & McCull., Mem. Qld. Mus. v, 1916, p. 109, pl. 11, 1 (Pl. xix).

A small species occurring in the western rivers of New South Wales.

170c. T. BIDYANA. SILVER PERCH. *Acerina, Cernua, bidyana* Mitchell, Three Exped. Int. E. Austr. i, 1838, p. 95, pl. 8. *Therapon ellipticus* Stead, Ed. Fish. N.S. Wales, 1908, p. 73, pl. 42 (Pl. xix).

Inhabits the western streams of the State, and while affording good sport for anglers, is a valuable food-fish. Length 16 inches.

171. HELOTES Cuv. & Val., H.N. Poiss. iii, 1829, p. 149 (*sexlineatus*).

171a. H. SEXLINEATUS. *Therapon sexlineatus* Quoy & Gaimard, Voy. Uranie, Zool., 1825, p. 340, pl. 59, 1. *H. sexlineatus* Bleeker, Atlas Ichth. vii, 1876, p. 118, pl. 64, 5 (Pl. xix).

This species was included in a list of Port Jackson fishes by Castelnau, but though widely distributed around the Australian coast, there is no evidence to prove its occurrence in New South Wales waters.

172. PELATES Cuv. & Val., H.N. Poiss. iii, p. 145 (*quadrilineatus*).

172a. P. SEXLINEATUS. TRUMPETER. *Therapon sexlineatus* Quoy & Gaimard, Voy. Uranie, Zool., 1824, p. 320. *P. quadrilineatus* Cuv. & Val., (*nec.* Bloch), H.N. Poiss. iii, 1829, p. 146, pl. 55 (Pl. xix).

Common on the sand flats in shallow water. Length 8 inches.

LXXX. Family PLESIOPIDAE.

A. Maxilla with a supplemental bone; a patch of teeth on the tongue. *Paraplesiops* (173).

AA. No supplemental maxillary bone and no teeth on the tongue.. *Trachinops* (174).

173. PARAPLESIOPS Bleeker, Verh. Akad. Amst. xv, no. 5, 1875, p. 3 (*bleekeri*).

173a. P. BLEEKERI. ROUNDHEAD. *Plesiops bleekeri* Gthr., Brit. Mus. Cat. Fish. iii, 1861, p. 364. *Paraplesiops bleekeri* Ogilby, Mem. Qld. Mus. vi, 1918, p. 46, pl. 16 (Pl. xix).

Not uncommon around rocky reefs. Length 12 inches.

174. TRACHINOPS Gunther, Brit. Mus. Cat. Fish. iii, 1861, p. 366 (*taeniatus*).

174a. T. TAENIATUS. *Id.* Gthr., *Tom. cit.; Id.* Kner, Zool Novara i, Fische, 1865, p. 215, pl. 8, 7 (Pl. xix).

A rare species. Length 3½ inches.

LXXXI. Family KUHLIDAE.

A. Caudal forked, lateral line complete; marine. *Kuhla* (175).

AA. Caudal rounded, lateral line interrupted; fluviatile. *Nannoperca* (176).

175. KUHLIA Gill, P. Acad. N. Sci. Philad., 1861, p. 48 (*ciliata*).

175a. K. TAENIURA. FLAGTAIL. *Dules taeniurus* Cuv & Val., H.N. Poiss. iii, 1829, p. 114. *Moronopsis taeniurus* Bleeker, Atlas Ichth. viii, 1877, p. 119, pl. 345, 5 (Pl. xix).

A tropical species, occasionally wandering southward to Port Jackson.

176. NANNOPERCA Gunther, Proc. Zool. Soc., 1861, p. 116 (*australis*).

176a. N. AUSTRALIS. PIGMY PERCH. *Id.* Gthr., *Tom. cit.*, pl. 19, 2; *Id.* McCulloch & Waite, Rec. S. Austr. Mus. i.1, 1918, p. 46, pl. 2, 1 (Pl. xx).

A minute species, the affinities of which are uncertain. It occurs plentifully in the Murray River. Length 3 inches.

LXXXII. Family PRIACANTHIDAE.

177. PRIACANTHUS Cuvier (Oken), Reg. Anim. ii, 1817, p. 281 (*macrophthalmus*).

A. Body much more than twice as long as deep; ventral fins as long as head. *Macracanthus* (177a).

AA. Body almost half as deep as long; ventrals much longer than the head. *velabundus* (177b).

177a. P. MACRACANTHUS. RED BULLSEYE. *Id.* Cuv. & Val. H.N. Poiss. iii, 1829, p. 108. *P. benmebari* Schlegel, Faun. Japonica, Pisces, 1842, p. 19, pl. 7, 1.

Not uncommon in deep water. Length 12 inches.

177b. P. VELABUNDUS. *Id.* McCulloch, Biol. Res. Endeavour iii. 3, 1915, p. 114, pl. 19 (Pl. xx).

A rare deep water species. Length 8 inches.

LXXXIII. Family APOGONIDAE.

A. Second dorsal fin as long as the anal.
  B. Two anal spines.
    C. Preoperculum serrated; marine. *Apogon* (178).
    CC. Preoperculum entire.
      D. Scales cycloid, tongue toothless; marine. *Adenapogon* (179).
      DD. Scales ciliated, tongue with teeth; fluviatile. *Glossamia* (180).
  BB. Three anal spines. *Apogonops* (181).

AA. Anal much longer than second dorsal. *Dinolestes* (182).

178. APOGON Lacepede, H.N. Poiss. iii, 1802, p. 411 (*ruber*).

A. Body with dark longitudinal stripes.
  B. More than two stripes on each side. *fasciata* (178a).
  BB. Two stripes on each side. *quadrifasciata* (178b).

AA. Body without longitudinal stripes.
    C. A lark ocellus above the pectoral. *atripes* (178c).
    CC. No definite colour-markings. *novae-hollandiae* (178d).

178a. A. FASCIATUS. SOLDIER FISH. *Mullus fasciatus* Shaw, White's Voy. N.S. Wales, 1790, p. 268 and plate. *Amia fasciata* var. *stevensi* McCulloch, Biol. Res. Endeavour iii. 3, 1915, pl. 16, 2 (Pl. xx).

Commonly taken in seine nets in shallow harbours and estuaries. Length 5 inches.

178b. A. QUADRIFASCIATUS. *Id.* Cuv. & Val., H.N. Poiss. ii, 1828, p. 153. *Amia quadrifasciata* Bleeker, Atlas Ichth. vii, 1876, p. 88, pl. 335, 1.

A tropical species, rare in New South Wales waters. Length 4½ inches.

178c. A. ATRIPES. *Amia nigripes* Ogilby (*nec.* Playfair), Ann. Qld. Mus. No. 10, 1911, p. 49, pl. 5, 2; *Id.* McCulloch, Biol. Res. Endeavour, iii, 3, 1915, p. 119, pl. 15, 2. *A. atripes;* Ogilby, P. Roy. Soc. Qld. xxviii, 1916, p. 116 (Pl. xx).

Occurs in the northern river estuaries. Length 4 inches.

178d. A. NOVAE-HOLLANDIAE. *Id.* Valenciennes, Nouv. Ann. Mus. Hist. Nat., 1832, p. 55, pl. 4, 2. ? *A. guntheri* Castelnau, P. Zool. Soc. Vict. i, 1872, p. 46.

A very imperfectly known species, of which the above synonymy may not be correct.

179. ADENAPOGON McCulloch, Rec. Austr. Mus. xiii. 4, 1921, p. 132. (*roseigaster*).

A. Dorsal and anal fins each with 10 rays, their margins straight. *roseigaster* (179a).

AA. Dorsal and anal fins each with 8 rays, their margins rounded. *woodi* (179b).

179a. A. ROSEIGASTER. *Apogon roseigaster* Ramsay & Ogilby, P.L.S.N.S.W. (2) i, 1887, p. 1101. *Adenapogon roseigaster* McCulloch, Rec. Austr. Mus. xiii. 4, 1921, p. 133, pl. 21, 2 (Plate xx).

A minute species, 3 inches long.

179b. A. WOODI. *Id.* McCulloch, Rec. Austr. Mus. xiii. 4, 1921, p. 134, pl. 21, 3.

180. GLOSSAMIA Gill, P. Acad. N. Sci. Philad., 1863, p. 82 (*aprion*).

180a. G. GILLII. *Apogonichthys gillii* Steindachner, Sitzb. Akad. Wiss. Wien lvi. i, 1867, p. 11, pl. 1, 1. *G. gillii* McCulloch, Rec. Austr. Mus. xi. 7, 1917, p. 171, pl. 21, 4 (Pl. xx).

A fresh water species. Length about 5 inches.

181. APOGONOPS Ogilby, P.L.S.N.S.W. xxi, 1896, p. 23 (*anomalus*).

181a. A. ANOMALUS. *Id.* Ogilby, *Tom. cit.*, p. 24; *Id.* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 55, fig. 13 (Pl. xx).

Abundant in depths about 60 fathoms, where it is largely preyed upon by the Deep-sea Flathead, *Platycephalus macrodon*. Length 5 inches.

182. DINOLESTES Klunzinger, Arch. Naturg. xxxviii. i, 1872, p. 29 (*mulleri*).

182a. D. LEWINI. LONG-FINNED SEA PIKE. *Esox lewini* Griffiths, Cuv. Anim. Kingd. x, 1834, p. 465, pl. 60. *Lanioperca mordax* McCoy, Prodr. Zool. Viet. dec. xii, 1886, p. 115 (Pl. xx).

A southern species. Length 20 inches.

LXXXIV. Family SILLAGINIDAE.

A. Dorsal fins united, scales small, about 130. *Sillaginodes* (183).

AA. Dorsal fins separate; scales larger, 65-75. *Sillago* (184).

183. SILLAGINODES Gill, P. Acad. N. Sci. Philad., 1861, p. 504 (*punctatus*).

183a. S. PUNCTATUS. SPOTTED WHITING. *Sillago punctatus* Cuv. & Val., H.N. Poiss. iii, 1829, p. 413; *Id.* Quoy & Gaimard, Voy. Astrolabe, Zool. iii, 1835, p. 671, pl. 1, 1 (Pl. xxi).

A southern species, not usually plentiful in our waters. Length 18 inches.

184. SILLAGO Cuvier, R. Anim. ii, 1817, p. 258 (*acuta*).

A. A conspicuous dark mark at the base of the pectoral fin.

B. Caudal peduncle as broad as postorbital portion of head. *ciliata* (184a).

BB. Caudal peduncle narrower than postorbital portion of head. *maculata* (184b).

AA. No black mark on base of pectoral fin.

C. Ventrals inserted below origin of first dorsal. *robusta* 184c).

CC. Ventrals inserted in advance of origin of first dorsal. *bassensis* (184d).

184a. S. CILIATA. SAND WHITING. *Id.* Cuv. & Val., H. N. Poiss. iii, 1829, p. 415; *Id.* McCoy, Prodr. Zool. Viet. dec. xix, 1889, pl. 182.

A fine edible fish, occurring on sandy bottoms all along the coastline. Length 18 inches.

184b. S. MACULATA. TRUMPETER WHITING. *Id.* Quoy & Gaimard, Voy. Uranie, 1824, p. 261, pl. 53, 2; *Id.* Bleeker, Atlas. Ichth. ix, 1877, pl. 389, 5 (Pl. xxi).

A rather more estuarine species than the preceding, and not quite so plentiful. Length about 12 inches.

184c. S. ROBUSTA. *Id.* Stead, New Fish. N.S. Wales, 1908, p. 7, pl. 2.

Known only from the unique holotype. Length about 6 inches.

184d. S. BASSENSIS. SCHOOL WHITING. *Id.* Cuv. & Val., H.N. Poiss. iii, 1829, p. 412; *Id.* Quoy & Gaimard, Voy. Astrolabe, Zool. iii, 1835, p. 672, pl. 1, 2 (Pl. xxi).

A small but fine table fish which is plentiful in deeper waters. Length 10 inches.

LXXXV. Family POMATOMIDAE.

185. POMATOMUS Lacepede, H.N. Poiss. iv, 1802, p. 435 (*skib*).

185a. P. SALTATRIX. TAILOR. *Perca saltatrix* Linn., Syst. Nat. 10th ed., 1758, p. 293. *Temnodon saltator* McCoy, Prodr. Zool. Viet. dec. xix, 1889, pl. 183 (Pl. xxi).

A voracious species which is plentiful on the coast, the young occurring abundantly in harbours and estuaries. Length 3 feet.

LXXXVI. Family RACHYCENTRIDAE.

186. RACHYCENTRON Kaup, Isis xix, 1826, p. 89 (*typus*).

186a. R. PONDICERIANUM. BLACK KINGFISH. *Elecate pondiceriana* Cuv. & Val., H.N. Poiss. viii, 1831, p. 329. *E. nigra* Day, Fish. India, 1876, p. 256, pl. 55, 2 (Pl. xxi).

A widely distributed oceanic fish which is sometimes plentiful on this coast. Length 4 feet.

LXXXVII. Family CARANGIDAE.

A. Caudal peduncle with a series of enlarged bony scutes on the lateral line.
  B. Lateral line armed along its whole length. *Trachurus* (187).
  BB. Lateral line armed on part of its length only.
    C. Dorsal and anal fins each with a detached posterior ray. *Decapterus* (188).
    CC. Posterior dorsal and anal rays not detached.
      D. Body oblong, not greatly compressed. *Caranx* (189).
      DD. Body rhomboid, greatly compressed. *Alectis* (190).
AA. No bony scutes on the caudal peduncle.
  E. Dorsal and anal without detached finlets.
    F. Caudal peduncle with a keel on each side. *Naucrates* (191).
    FF. Caudal peduncle without keels.
      G. Dorsal spines united by membrane. *Seriola* (192).
      GG. Dorsal spines not united by membrane. *Trachinotus* (193).
  EE. Dorsal and anal with more or less detached finlets.
    H. Dorsal spines connected by membrane *Elagatis* (194).
    HH. Dorsal spines not connected by membrane. *Scomberoides* (195).

187. TRACHURUS Rafinesque, Caratt. Gen. Spec. Sicilia, 1810, p. 41 (*trachurus*).

A. Depth 4-4.4 in the length; less than 73 scutes on the lateral line. *declivis* (187a).

AA. Depth 4.7-5.2 in the length; more than 73 scutes on the lateral line. *novae-zelandiae* (187b).

187a. T. DECLIVIS. YELLOW-TAIL. *Caranx declivis* Jenyns, Zool. Beagle iii, 1841, p. 68, pl. 14 (Pl. xxii.)

Abundant in all inlets. Length 13 inches.

187b. T. NOVAE-ZELANDIAE. COWANYOUNG. *Id.* Richardson, 12th. Rept. Brit. Assn. 1842 (1843), p. 21. *T. trachurus* McCoy, Prodr. Zool. Vict. dec.ii, 1878, pl. 18.

An oceanic species, sometimes entering inlets in shoals. Length 18 inches.

188. DECAPTERUS Bleeker, Nat. Tijd. Ned. Ind. i, 1851, p. 358 (*kurra*).

188a. D. LEPTOSOMUS. *Id.* Ogilby, P.L.S.N.S.W. xxii, 1898, p. 760.

A little known species. Length about 7 inches.

189. CARANX Lacepede, H.N. Poiss. iii, 1802, p. 57 (*carangus.*)

A. Dorsal and anal fins emarginate, the anterior rays longest.

B. Median dorsal spines much longer than the eye; lateral line strongly arched. *georgianus* (189a).

BB. Median dorsal spines about as long as the eye; lateral line feebly arched. *ferdau* (189b).

AA. Dorsal and anal fins rounded, the median rays longer than the anterior. *hullianus* (189c).

189a. C. GEORGIANUS. TREVALLY. *Id.* Cuv. & Val., H.N. Poiss. ix, 1833, p. 85; *Id.* McCulloch, Biol. Res. Endeavour iii. 3, 1915, p. 126, pl. 20 (Pl. xxii).

Plentiful on the coast, the young entering inlets where they are often captured with hauling nets. Length 30 inches.

189b. C. FERDAU. BLUE TREVALLY. *Scomber ferdau* Forskal, Descr. Anim., 1775, p. 55. *Caranx ferdau* Gunther, Fische Sudsee v, 1876, p. 134, pls. 77-78. ? *Caranx hippos* Ogilby, Cat. Fish, N.S. Wales, 1886, p. 26 (Not *C. hippos* Linn.).

A widely distributed tropical species which is occasionally captured outside Port Jackson. It is probable that references to *C. hippos* in New South Wales are based upon this species.

189c. C. HULLIANUS. *Id.* McCulloch, Rec. Austr. Mus. vii, 1909, p. 319, pl. 91 (Pl. xxii).

Known only from the unique holotype, 4½ inches long.

190. ALECTIS Rafinesque, Analyse Nature, 1815, p. 84 (*virescens*).

A. Eye half as wide as the preorbital. *indica* (190a).

AA. Eye as wide as the preorbital. *ciliaris* (190b).

190a. A. INDICA. DIAMOND TREVALLY. *Scyris indica* Ruppell, Atlas Fische Roth. Meer. 1828, p. 128, pl. 33, 1. *A. indica* Ogilby, Mem. Qld. Mus. iii, 1915, p. 83, pl. 26.

A widely distributed tropical species which wanders into our northern waters. Length 3 feet.

190b. A. CILIARIS. PENNANT FISH. *Zeus ciliaris* Bloch, Ausl. Fische vi, 1788, p. 29, pl. 91. *A. ciliaris* Ogilby, Mem. Qld. Mus. iii, 1915, p. 88, pl. 27 (Pl. xxii).

Another tropical species occasionally extending southward to Port Jackson. Length 14 inches.

191. NAUCRATES Rafinesque, Carat. Gen. Spec. Sicilia, 1810, p. 43 (*fanfarus*).

191a. N. DUCTOR. PILOT FISH. *Gasterosteus ductor* Linn., Syst. Nat. 10th ed., 1758, p. 295. *Naucrates indicus* Valenciennes, Illustr. Poiss. Regne Anim., 1837, p. 125, pl. 54, 1 (Pl. xxii).

192. SERIOLA *Cuvier*, R. Anim. ii, 1817, p. 315 (*dumerili*).

A. 31-34 dorsal rays.
  B. Depth of body less than length of head. *grandis* (192a).
  BB. Depth of body greater than length of head. *simplex* (192b).
AA. 23-25 dorsal rays. *hippos* (192c).

192a. S. GRANDIS. Kingfish. *Seriola grandis* Castelnau, Proc. Zool. Soc. Viet. i, 1872, p. 114; *Id.* McCulloch, Biol. Res. Endeavour iii., 3, 1915, p. 121, pl. 35, 1 (Pl. xxi).

A large species which periodically moves along the coast in shoals. Its capture affords good sport for rod-fishermen, but it is of poor quality as a food-fish. Length 6 feet.

192b. S. SIMPLEX. *Id.* Ramsay & Ogilby, P.L.S.N.S.W. x, 1886, p. 757; *Id.* McCulloch, Biol. Res. Endeavour iii. 3, 1915, p. 123, pl. 37, 3.

Known only from the unique holotype, which was supposed to have been taken in Port Jackson.

192c. S. HIPPOS. SAMSONFISH. *Id.* Gunther, A.M.N.H. (4) xvii, 1876, p. 392; *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 71, pl. 9 (Pl. xxi).

Occurs plentifully off the coast where it is taken by line-fishermen. Length 2 feet.

193. TRACHINOTUS Lacepède, H.N. Poiss. iii, 1802, p. 78 (*falcatus*).

A. 23-26 dorsal rays; depth much less than half of length. *botla* (193a).
AA. 18-20 dorsal rays; depth greater than half of length. *ovatus* (193b).

193a. T. BOTLA. DART. *Scomber botla* Shaw, Gen. Zool. iv, 1803, p. 591. *T. botla* Ogilby, Mem. Qld. Mus. iii, 1915, p. 93, pl. 28 (Pl. xxii).

A tropical species wandering southward to Botany Bay. Length 22 inches.

193b. T. OVATUS. SNUB-NOSED DART. *Gasterosteus ovatus* Linn., Syst. Nat. 10th ed, 1758, p. 296. *T. ovatus* Ogilby, Mem. Qld. Mus. v, 1916, p. 154, pl. 19 (Pl. xxii).

A tropical fish which is not certainly known from New South Wales waters. Length 30 inches.

Trachinotus bailloni Lacepède, has been incorrectly recorded from New South Wales—see Ogilby, Mem. Qld. Mus. v. 1916, p. 149, pl. 18.

194. ELAGATIS Bennett, Narrat. Whaling Voy. ii, 1840, p. 283 (*bipinnulatus*).

194a. E. BIPINNULATUS. RUNNER. *Seriola bipinnulata* Quoy & Gaimard, Voy. Uranie, 1824, p. 363, pl. 61, 3. *E. bipinnulatus* Stead, Add. Fish. Faun. N.S. Wales, 1907, p. 17, pl. 5 (Pl. xxii).

A single specimen, about 27 inches long, was captured off Port Jackson.

195. SCOMBEROIDES Lacepède, H. N. Poiss. iii, 1801, p. 50 (*commersonianus*).

195a. S. SANCTI-PETRI. LEATHERSKIN. *Chorinemus sancti-petri* Cuv. & Val., H. N. Poiss, viii, 1831, p. 379, pl. 236 (Pl. xxi.).

Not common in New South Wales waters. Length 20 inches.

LXXXVIII. Family CORYPHAENIDAE.

196. CORYPHAENA Linn., Syst. Nat. 10th Ed., 1758, p. 261 (*hippurus*).

196a. C. HIPPURUS. DOLPHIN. *Id.* Linn., *Tom cit.;* *Id.* Day, Fish. India, 1876, p. 248, pl. 53, 6 (Pl. xxiii.).

An oceanic species ranging over all warm seas. Length 6 feet.

LXXXIX. Family BRAMIDAE.

197. BRAMA Bloch & Schneider, Syst. Ichth., 1801, p. 98 (*raii*).

197a. B. RAII. *Sparus raii* Bloch, Ausl. Fische v, 1791, p. 95, pl. 273. *B. raii* McCoy, Prodr. Zool. Vict. dec. xiv, 1887, pl. 133 (Pl. xxiii.).

The only record of this species from New South Wales is unsatisfactory, but the fish is widely distributed, and probably occurs on the coast. Length 30 inches.

XC. Family CENTROPOMIDAE.

A. Dorsal spines increasing in height backwards; scales in about 50 rows. *Glaucosoma* (198).

AA. Posterior dorsal spines shorter than the anterior; scales in about 30 rows. *Ambassis* (199).

198. GLAUCOSOMA (Temm. & Schleg.) Richardson, Ichth. Erebus & Terror, 1846, p. 27 (*burgeri*).

198a. G. SCAPULARE. PEARL PERCH. *Id.* (Ramsay) Macleay, P.L.S.N.S.W. v, 1881, p. 334, pl. 13. *Id.* Roughley, Fish. Austr., 1916, p. 83, pl. 25 (Pl. xxiii.).

A deeper water species occurring on the northern portions of the coast. Length 2 feet.

199. AMBASSIS Cuv. & Val., H. N. Poiss. ii, 1829, p. 176 (*ambassis*).

A. Lateral line complete. *jacksoniensis* (199a).

AA. Lateral line interrupted or obsolete. Subgenus *Priopis*.

B. 10-11 dorsal and anal rays; marine. *ramsayi* (199b).

BB. 7-8 dorsal and anal rays; fresh water.

C. Eye shorter than postorbital part of head; fins plain. *castelnaui* (199c).

CC. Eye as long as postorbital part of head; dorsals and ventrals tipped with black. *agassizi* (199d).

199a. A. JACKSONIENSIS. *Id.* Macleay, P.L.S.N.S.W. v, 1881, p. 340.

A small fish assembling in schools around wharf-piles in inlets along the coast. Length 2½ inches.

199b. A. RAMSAYI. *Pseudoambassis ramsayi*, Macleay, P.L.S.N.S.W. v, 1881, p. 340. *Priopis ramsayi* McCulloch, Biol. Res. Endeavour i. 1, 1911, p. 57, pl. 16, 3 (Pl. xxiii.).

A. buruensis Bleeker, has been included in a New South Wales list by Waite (Mem. N.S. Wales Nat. Club ii, 1904, p. 29). The record is perhaps based upon specimens of *A. ramsayi*, the two species being very similar.

199c. A. CASTELNAUI. *Pseudoambassis castelnaui* Macleay, P.L.S.N.S.W. v, 1881, p. 339.

A fresh water species occurring in the Murray River system. Length 3½ inches.

199d. A. AGASSIZI. CHANDA PERCH. *Id.* Steindachner, Sitzb. Akad. Wiss, Wien lv. i, 1867, p. 9.

A minute species ranging over south-eastern Queensland and the northern coastal rivers of New South Wales. Length 2½ inches.

XCI. Family ARRIPIDIDAE.

200. ARRIPIS Jenyns, Zool. Beagle iii, 1840, p. 13 (*georgianus*).

A. 13-14 dorsal rays. *georgianus* (200a).
AA. 15-17 dorsal rays. *trutta* (200b).

200a. A. GEORGIANUS. *Centropristis georgianus* Cuv. & Val., H. N. Poiss. vii, 1831, p. 451. *A. georgianus* McCoy, Prodr. Zool. Viet. dec. xix, 1889, pl. 184.

A southern species which has been recorded from Port Jackson. Length 16 inches.

200b. A. TRUTTA. AUSTRALIAN SALMON. *Sciaena trutta* (Forster) Bloch & Schneider, Syst. Ichth., 1801, p. 542. *Centropristis salar* Richardson, Ichth. Erebus & Terror, 1845, p. 29, pl. 20, 4-6 (Pl. xxiii.).

One of the most plentiful of our food-fishes, moving along the coast in huge shoals. Length 30 inches.

XCII. Family LUTIANIDAE.

201. LUTIANUS Bloch, Ausl. Fische iv, 1790, p. 105 (*lutianus*).

A. Nape of head scaly, the scales extending forward to between eyes. *kasmira* (201g).
AA. Nape of head largely naked, interorbital area naked.
B. Eleven dorsal spines.
C. Soft dorsal pointed, the rays longer than the spines.
D. 13-14 dorsal, and 8-9 anal rays. *macleayanus* (201c).
DD. 16-17 dorsal, and 10-11 anal rays. *sebae* (201e).
CC. Soft dorsal rounded, the rays shorter than the spines. *amabilis* (201f).
BB. Ten dorsal spines.
E. A large dark spot on the lateral line.
F. 13 dorsal rays; dark spot largely below lateral line. *fulviflamma* (201b).
FF. 14-15 dorsal rays; dark spot largely above lateral line. *russelli* (201a).
EE. Body nearly uniform, no dark spot on lateral line. *superbus* (201d).

201a. L. RUSSELLI. MOSES PERCH. *Mesoprion russelli* Bleeker, Verh. Bat. Gen. xxii, 1849, p. 41. *Lutjanus russelli* Bleeker, Atlas Ichth. viii, 1876, p. 71, pl. 300, 2.

A tropical species, occurring on the northern coast of the State. Length about 14 inches.

201b. L. FULVIFLAMMA. BLACK-SPOTTED SEA PERCH. *Sciaena fulviflamma* Forskal, Descr. Anim., 1775, p. 45. *Lutjanus fulviflamma* Bleeker, Atlas Ichth. viii, 1876, p. 65, pl. 344, 3 (Pl. xxiii.).

This species is very similar to the preceding.

201c. L. MACLEAYANUS. *Genyoroge macleayana* Ramsay, P.L.S.N.S.W. viii. l, 1883, p. 178.

A rare species known from a single specimen over 2 feet long.

201d. L. SUPERBUS. PURPLE SEA PERCH. *Diacopus superbus* Castelnau, P.L.S.N.S.W. ii, 1878, p. 228. *Lutianus superbus* McCulloch, Mem. Qld. Mus. iii, 1915, p. 52, pl. 17.

Another little known species, but once recorded from the northern coast. Length about 2 feet.

201e. L. SEBAE. KING SNAPPER or GOVERNMENT BREAM. *Diacope sebae* Cuv. & Val., H. N. Poiss. ii, 1828, p. 411. *Lutjanus sebae* Bleeker, Atlas Ichth. viii, 1876, p. 62, pl. 350, 2.

A brilliantly coloured and prized table fish, attaining a weight of 48 pounds. It is widely distributed in the tropics, and enters our waters on the north coast.

201f. L. AMABILIS. YELLOW-BANDED HUSSAR. *Genyoroge amabilis* De Vis, P. Roy. Soc. Qld. i, 1884, p. 145. *Lutianus amabilis* McCulloch, Mem. Qld. Mus. iii, 1915, p. 53, pl. 18 (Pl. xxiii.).

Another beautifully coloured and fine edible fish, reaching a length of 18 inches.

201g. L. KASMIRA. BLUE-BANDED HUSSAR. *Sciaena kasmira* Forskal, Descr. Anim., 1775, p. 46. *Lutjanus bengalensis* Bleeker, Atlas Ichth. viii, 1876, p. 55, pl. 333, 4.

A smaller species, ornamented with brilliant blue bands. Length 10 inches.

202. ETELIS Cuvier & Valenciennes, H. N. Poiss. ii, 1828, p. 127 (*carbunculus*).

202a. E. SP. *Id.* Gunther, Challenger Zool. i, 1880, p. 27.

Young examples 2½ inches long, from deep water, may prove to be referable to *E. carbunculus*.

203. APRION. Cuv. & Val., H. N. Poiss. vi, 1830, p. 544 (*virescens*).

203a. A. ROSEUS. *Aphareus roseus* Castelnau, P.L.S.N.S.W. iii, 1879, p. 373. *Aprion roseus* McCulloch, Rec. Austr. Mus. xi. 7, 1917, p. 173, pl. 30 (Pl. xxiii.).

A tropical species, occurring on the northern part of the coast, and reaching a length of at least 18 inches. It is perhaps the adult stage of *A. microlepis* Bleeker.

XCIII. Family NEMIPTERIDAE.

204. NEMIPTERUS Swainson, Nat. Hist. Classif. Fish. Rept. Amphib. ii, 1839, p. 223 (*filamentosus*).

204a. N. THEODOREI. BUTTERFLY BREAM. *Id.* Ogilby, P. Roy. Soc. Qld. xxviii, 1916, p. 113 and Mem. Qld. Mus. vi, 1918, p. 55, pl. 19 (Pl. xxiv.).

Specimens submitted for sale in the Sydney markets probably came from the northern part of the coast. Length about 12 inches.

XCIV. Family ERYTHRICHTHYIDAE.

205. EMMELICHTHYS Richardson, Ichth. Erebus & Terror, 1845, p. 47 (*nitidus*).

205a. E. NITIDUS. *Id.* Richardson, *Tom. cit.*, pl. 29, 7-8 (Pl. xxiv.).

A rare species which has been recognised from this State in association with shoals of Pilchards. Length, 14 inches.

XCV. Family LOBOTIDAE.

206. LOBOTES Cuvier, R. Anim. 2nd ed., ii., 1829, p. 177 (*surinamensis*).

206a. L. SURINAMENSIS. TRIPLE-TAIL. *Holocentrus surinamensis* Bloch, Ausl. Fische iv, 1790, p. 98, pl. 243. *Lobotes surinamensis* Bleeker, Atlas Ichth. viii, 1876, p. 12, pl. 311, 4 (Pl. xxiv.).

An excellent food-fish, growing to 30 inches long, which wanders southward from the tropics into our northern waters.

XCVI. Family POMADASIDAE.

A. A central grove behind the symphysis of the lower jaw. *Pomadasys* (207).
AA. No such groove.
B. 13 dorsal spines; scales in 65 or more rows below the lateral line. *Plectorhinchus* (208).
BB. 14 dorsal spines; scales in 50 rows below the lateral line. *Euelatichthys* (209).

207. POMADASYS Lacep., H. N. Poiss. iv, 1802, p. 515 (*argenteus*).

207a. P. HASTA. JAVELIN FISH. *Lutjanus hasta* Bloch, Ausl. Fische iv, 1790, p. 109, pl. 246, l. *Pomadasys hasta* Bleeker, Atlas Ichth. viii, 1876, p. 28, pl. 325, 3 (Pl. xxiv.).

An excellent food-fish, growing to at least 2 feet long. It is common in Queensland, and ranges into the northern waters of New South Wales.

208. PLECTORHINCHUS Lacep., H. N. Poiss. iii, 1802, p. 134 (*chaetodonoides*).

A. 9-10 dorsal spines. *pictus* (208b).
AA. 13 dorsal spines. *reticulatus* (208a).

208a. P. RETICULATUS. *Diagramma reticulatum* Gthr., Brit. Mus. Cat. Fish. i, 1859, p. 334. *Plectorhynchus reticulatus* McCulloch, Biol. Res. Endeavour iv. 4, 1916, p. 185, pl. 53 (Pl. xxiv.).

A little known species, but once recorded from New South Wales waters.

208b. P. PICTUS. GOLDEN-SPOTTED SWEETLIPS. *Perca picta* Thunberg, Nya. Handl. Stockholm xiii, 1793, p. 141, pl. 5, l. *Plectorhynchus pictus* Bleeker, Atlas Ichth, viii, 1876, p. 24, pl. 329, 4.

An indifferent food-fish, reaching a length of two feet. It has been recorded from the Tweed River Heads as *Spilotichthys labiosus*.

209. EUELATICHTHYS Fowler, Journ. Acad. N. Sci. Philad. (2) xii, 1904, p. 527 (*affine*).

209a. E. NIGER. BROWN SWEETLIPS. *Pristipoma niger* (Mertens) Cuv. & Val., v, 1830, p. 258. *Plectorhynchus crassispinis* Bleeker, Atlas Ichth. viii, 1876, p. 15, pl. 342, l. (Pl. xxiv.).

A well flavoured species, growing to over 2 feet long, and occurring on the northern portion of the coast.

XCVII. Family GERRIDAE.

210. GERRES (Cuvier) Quoy & Gaimard, Voy. Uranie, 1824, p. 293 (*vaigiensis*).

A. About 36 scales on the lateral line.
B. Colouration uniformly silver. *ovatus* (210a).
G. sabfasciatus, with indistinct vertical bands, is apparently near *G.*
AA. About 45 scales on the lateral line. *argyreus* (210c).

210a. G. OVATUS. SILVERBELLY. *Id.* Gthr., Brit. Mus. Cat. Fish. i, 1859, p. 343. *Xystaema ovatum* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 83, pl. 13 (Pl. xxiv.).

Abundant in shallow waters and growing to 10 inches long.

210b. G. SUBFASCIATUS. *Id.* Cuvier & Valenciennes, H. N. Poiss. vi, 1830, p. 477.

A little known species, said to have been taken in Port Jackson.

210c. G. ARGYREUS. *Cichla argyrea* (Forster) Bloch & Schneider, Syst. Ichth. 1801, p. 344.

A tropical species straying into New South Wales waters.

XCVIII. Family SCIAENIDAE.

A. Precaudal vertebrae less numerous than those of caudal region; caudal fin convex posteriorly. *Sciaena* (211)

AA. Precaudal vertebrae more numerous than those of caudal region; caudal fin slightly emarginate posteriorly. *Atractoscion* (212).

211. SCIAENA Linn., Syst. Nat. 10th. ed., 1758, p. 289 (*umbra*).

211a. S. ANTARCTICA. JEWFISH. *Id.* Castelnau, P.Z.S. Viet. i, 1872, p. 100, fig. *S. hololepidota antarctica* Ogilby, Mem. Qld. Mus. vi, 1918, p. 70, pl. 21 (Pl. xxiv.).

A most important food-fish, growing to a length of over 6 feet. It is perhaps identical with the Maigre of European waters.

212. ATRACTOSCION Gill, P. Acad. N. Sci. Philad., 1862, p. 18 (*aequidens*).

212a. A. ATELODUS. TERAGLIN. *Otolithus atelodus* Gunther, A.M.N.H. (3) xx, 1867, p. 60. *Cynoscion atelodus* Roughley, Fish. Austr., 1916, p. 115, pl. 36 (Pl. xxiv.).

A fine edible fish, sometimes occurring plentifully off the coast. Length 3 feet.

CHECK LIST OF THE FISH AND FISH-LIKE ANIMALS OF NEW SOUTH WALES.

Part iii

By Allan R. McCulloch, Zoologist, Australian Museum.

(*By permission of the Trustees of the Australian Museum.*)

XCIX. Family MULLIDAE.

A. Palate toothless; teeth of jaws in 1-2 rows — *Upeneus* (213).
AA. Vomer with, palatines with or without teeth.
  B. Palatines with teeth. — *Upeneoides* (214).
  BB. Palatines toothless. — *Upeneichthys* (215).

213. UPENEUS Cuvier, Reg. Anim. (2 ed.) ii., 1829, p. 157 (*bifasciatus*).
213a. U. SIGNATUS. SPOTTED RED MULLET. *Id.* Gunther, A.M.N.H. (3) xx, 1867, p. 59. *Mullus signatus* Ogilby, Ed. Fish. N.S.W., 1893, p. 35, pl. 11.

Though the young of this species are plentiful in Port Jackson, the adults are not often seen. Length 10 inches.

(A specimen recorded by Bleeker as *U. spilurus* Bleeker, from Port Jackson, Nederl. Tydschr. Dierk. ii, 1865, p. 71, is probably *U. signatus*).

214. UPENEOIDES Bleeker, Verh. Bat. Gen. xxii, 1849, p. 63 (*vittatus*).
214a. U. TRAGULA. *Upeneus tragula* Richardson, Ichth. China, 1845, p. 220. *Upeneoides tragula* Day, Fish. India, 1875, p. 121, pl. 30, 4 (Pl. xxv).

Young specimens are captured by seine fishermen, but adults are rare in our waters. Length 9 inches.

215. UPENEICHTHYS Bleeker, Verh. Akad. Amsterdam ii, 1855, p. 7 (*porosus*).
215a. U. POROSUS. BLUE-STRIPED RED MULLET. *Upeneus porosus* Cuvier & Valenciennes, H. N. Poiss. iii, 1829, p. 455. *Upeneichthys porosus* Roughley, Fish. Austr., 1916, p. 139, pl. 44 (Pl. xxv).

A brilliantly coloured fish occurring around rocky headlands. Length 10 inches.

(*U. vlamingii* Cuv. & Val., has been recorded from Port Jackson by Castelnau, F.L.S. N.S.W. iii, 1879, p. 372. The record was evidently based upon a specimen of *U. porosus*).

C. Family LETHRINIDAE.

A. Cheeks naked. *Lethrinus* (216).
AA. Cheeks scaly. *Pentapus* (217).

216. LETHRINUS Cuvier, Reg. Anim. (2 ed.) ii, 1829, p. 184 (*choerorhynchus*).

A. Second dorsal spine longer than those following it, more or less produced. *nemataeanthus* (216a).
AA. Second dorsal spine shorter than those following it.
B. 6 scales between first dorsal spine and lateral line. *opercularis* (216b).
BB. 5 scales between first dorsal spine and lateral line. *chrysostomus* (216c).

216a. L. NEMATACANTHUS. *Id.* Bleeker, Verh. Bat. Gen. xxvi, 1856, p. 90, and Atlas Ichth. viii, 1876, p. 114, pl. 337, 3.

A tropical species occurring in southern Queensland, and once recorded from New South Wales waters.

216b. L. OPERCULARIS. *Id.* Cuvier & Valenciennes, H. N. Poiss. vi, 1830, p. 289; *Id.* Bleeker, Atlas Ichth. viii, 1876, p. 119, pl. 335, 5 (Pl. xxv.).

Another tropical species rarely wandering southward into New South Wales.

216c. L. CHRYSOSTOMUS. ISLAND SNAPPER or YELLOW-MOUTHED SNAPPER. *Id.* Richardson, Ichth. Erebus & Terror, 1848, p. 118, pl. 60, 6-7.

Occasionally captured in our northern waters, and reaching 3 feet in length.

(Castelnau, P.L.S. N.S.W. iii, 1879, p. 372, has recorded a species from Port Jackson, which he doubtfully identified as *L. glyphodon* Gunther, while Kner, Novara Zool. i, 1865, p. 81, equally doubtfully identified a fish a *L. harak* Forskal, which was said to have been taken at Sydney. There is no reason to suppose either species occurs in New South Wales).

217. PENTAPUS Cuvier & Valenciennes, Hist. Nat. Poiss. vi, 1830, p. 258 (*vittatus*).

217a. *P. setosus. Id.* Cuv. & Val., *Ibid.* p. 270. *Id.* Bleeker, Atlas. Ichth. viii, 1876, p. 101, pl. 324, 1 (Pl. xxvi).

Another tropical fish ranging to southern Queensland, and once recorded from New South Wales. Length 10 inches.

CI. Family SPARIDAE.

A. Molars in 2 series; colour pinkish. *Pagrosomus* (218).
AA. Molars in 3 or more series; colour olive-silver. *Sparus* (219).

218. PAGROSOMUS Gill, Mem. Acad. Sci. Wash. vi, 1893, p. 97 (*auratus*).

218a. P. AURATUS. SNAPPER. *Labrus auratus* (Forster) Bloch & Schneider, Syst. Ichth. 1801, p. 266. *P. auratus* Roughley, Fish. Austr., 1916, p. 130, pl. 42 and frontispiece (Pl. xxv).

The choice fish of our market and commanding a higher price than any other. The young stages are popularly known as Cocknies, which develop through Red Bream and Squire into the adult form recognised as Snapper. Large examples in which the nape is elevated into a huge bony boss and the snout developed into a curious fleshy nose are known as Old-men Snapper; these attain a weight of over 30 pounds.

219. SPARUS Linn., Syst. Nat. 10th ed. i, 1758, p. 277 (*aurata*).

A. Anal with 7-9 rays; body without longitudinal stripes. *australis* (219a).
AA. Anal with 11 rays; body with golden longitudinal stripes. *sarba* (219b).

219a. S. AUSTRALIS. BLACK BREAM. *Chrysophrys australis* Gunther, B.M. Cat. Fish. i, 1859, p. 494; *Id.* McCoy, Prodr. Zool. Viet. dec. i, 1878, pl. 4 (Pl. xxv).

One of the most important of our food fishes, occurring in great quantities in the harbours and estuaries. Length 22 inches, weight 7¼ pounds.

219b. S. SARBA. TARWHINE. *Id.* Forskal, Descr. Anim., 1775, p. 31. *Chrysophrys sarba* Stead, Ed. Fish. N.S. Wales, 1908, p. 78, pl. 47.

A northern fish, less plentiful than the preceding. Length 16 inches, weight 3½ pounds.

CII. Family KYPHOSIDAE.

220. KYPHOSUS Lacep., H. N. Poiss. iii, 1802, p. 114 (*bigibbus*).

220a. K. SYDNEYANUS. SILVER DRUMMER. *Pimelepterus sydneyanus* Gunther, A.M.N.H. (5) xviii, 1886, p. 368. *K. sydneyanus* McCulloch. Rec. Austr. Mus. xiii. 2, 1920, p. 56, pl. 12, 2 (Pl. xxv).

Abundant during the summer months, but not regarded as of much value as a food fish. Length 30 inches.

CIII. Family GIRELLIDAE.

A. Operculum largely naked; less than 60 scales in a longitudinal row. *Girella* (221).
AA. Operculum scaly; about 80 scales in a longitudinal row. *Melambaphes* (222).

221. GIRELLA Gray, Illustr. Ind. Zool., 1835, pl. 98 (*punctata*).

A. Outer teeth of jaws imbricate, in 2-4 rows. *tricuspidata* (221a).
AA. Outer teeth of jaws in single rows.
B. 14-16 dorsal spines; nostrils scarcely fimbriate. *cyanea* (221b).
BB. 13 dorsal spines; nostrils markedly fimbriate. *elevata* (221c).

221a. G. TRICUSPIDATA. BLACKFISH. *Boops tricuspidatus* Quoy & Gaimard, Voy. Uranie, 1824, p. 296. *G. tricuspidata* McCulloch, Rec. Austr. Mus. xiii. 2, 1920, p. 60, pl. 14, 1 (Pl. xxv).

One of the commonest fishes in the markets, being captured by net fishermen in inlets throughout the year, while it is also taken by line along the coast. Length 20 inches, weight 6 pounds.

221b. G. CYANEA. BLUEFISH. *Id.* Macleay, P.L.S. N.S.W. v, 1881, p. 409. *Id.* Waite, Rec. Austr. Mus. v. 3, 1904, p. 167, pl. 20, 3.

Not common on this coast but plentiful at Lord Howe Island, where it is regarded as a fine table fish. Length about 2 feet.

221c. G. ELEVATA. BLACK DRUMMER. *Id.* Macleay, P.L.S.N.S.W., v, 1881, p. 408; *Id.* McCulloch, Rec. Austr. Mus. xiii. 2, 1920, p. 64, pl. 13, 1.

Lives among weed-covered rocks along the coast, and occasionally congregates in schools. Length about 2 feet.

(*G. zonata* Gunther, has been included in a list of Port Jackson fishes by Castelnau, P.L.S.N.S.W. iii, 1879, p. 350, but the species has not since been recognised from New South Wales).

222. MELAMBAPHES Gunther, A.M.N.H. (3) xi, 1863, p. 115 (*nigroris* Gthr., not of Cuv. & Val.).

222a. M. ZEBRA. *Crenidens zebra* Richardson, Ichth. Erebus & Terror, 1846, p. 70. *Girella zebra* Steindachner, Sitzb. Akad. Wiss. Wien. liii, 1866, p. 430, pl. 6, 2 (Pl. xxv).

The specimen described and figured by Steindachner was said to have been taken in Port Jackson, but no other appears to have been recognised from New South Wales.

CIV. Family PEMPHERIDAE.

A. Scales of the body ctenoid. *Pempheris* (223).
AA. Scales of the body cycloid. *Liopempheris* (224).

223. PEMPHERIS Cuvier, Reg. Anim. 2nd ed. ii, 1829, p. 195 (*touea* = *compressa*).

223a. P. COMPRESSA. BULLSEYE. *Sparus compressus* Shaw, White's Voy. N.S. Wales, 1790, p. 267, pl. 12. *P. compressus* Stead, Ed. Fish. N.S. Wales, 1908, p. 49, pl. 18 (Pl. xxvi).

A small species covered with rough scales. Length about 8 inches.

224. LIOPEMPHERIS Ogilby, Mem. Qld. Mus. ii, 1913, p. 62 (*multiradiata*).

A. 46-50 scales on lateral line to hypural joint. *multiradiata* (224a).
AA. About 60 scales on lateral line to hypural joint. *affinis* (224b).

224a. L. MULTIRADIATA. BIG-SCALED BULLSEYE. *Pempheris multiradiatus* Kluuzinger, Sitzb. Akad. Wiss. Wien. lxxx. i, 1879, p. 381. *P. macrolepis* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 73, pl. 10.

Occurs in water of moderate depths where it is captured by the trawlers. Length about 8 inches.

224b. L. AFFINIS. *Pempheris affinis* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 45, pl. 7, 1 (Pl. xxvi).

A rare species less than 6 inches long.

CV. Family MONODACTYLIDAE.

A. 8 dorsal spines, scales finely ctenoid. *Monodactylus* (225).
AA. 5 dorsal spines; scales cycloid. *Schuettea* (226).

225. MONODACTYLUS Lacep., H. N. Poiss. iii, 1802, p. 131 (*falciformis*).

225a. M. ARGENTEUS. SILVER BATFISH. *Chaetodon argenteus* Linn., Syst. Nat. 10th ed. i, 1758, p. 272. *Psettus argenteus* Richardson, Ichth. Erebus & Terror, 1846, p. 57, pl. 35, 1-3 (Pl. xxvi).

A widely distributed tropical fish which ranges southward to Sydney. Length 8 inches.

226. SCHUETTEA Steindachner, Sitzb. Akad. Wiss. Wien. liii. 1, 1866, p. 449 (*scalaripinnis*).

226a. S. SCALARIPINNIS. *Id.* Steindachner, *Ibid.*, pl. 6, *Id.* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 81, pl. 15 (Pl. xxvi).

Occasionally captured in nets on the coast near Sydney. Length 8 inches.

CVI. Family SCORPIDIDAE.

A. Dorsal spines increasing in height backwards, lower than the anterior rays. *Scorpis* (227).
AA. Median dorsal spines longest, higher than the rays. *Atypichthys* (228).

227. Scorpis Cuv. & Val., H. N. Poiss. viii, 1831, p. 503 (*georgianus*).

A. Anal rays equal to, or more numerous than those of dorsal. *lineolatus* (227a).
AA. Anal rays less numerous than those of dorsal. *violaceus* (227b).

227a. S. LINEOLATUS. Sweep. *Id.* Kner, Novara Zool. i, Fische pt. 1, 1865, p. 108, pl. 5, 3 (Pl. xxvi).

Young specimens are very plentiful in inlets, while adults are more commonly captured along the coast. Length 12 inches.

227b. S. VIOLACEUS. Hard-belly. *Ditrema violacea* Hutton, Trans. N.Z. Inst. v, 1873, p. 261, pl. 8, 31b.

Abundant at Lord Howe Island, and once recorded from near Sydney. The record needs verification. Length 9 inches.

228. Atypichthys Gunther, B.M. Cat. Fish. iv, 1862, p. 510 (*strigatus*).

228a. A. STRIGATUS. Mado. *Atypus strigatus* Gunther, B.M. Cat. Fish. ii, 1860, p. 64. *Id.* Steindachner, Sitzb. Akad. Wiss. Wien liii, 1866, p. 435, pl. 4, 2 (Pl. xxvi).

Plentiful in inlets along the coast. Length 10 inches.

CVII. Family Scatophagidae.

229. Scatophagus Cuvier & Valenciennes, H. N. Poiss. vii, p. 136 (*argus*).

A. Margins of dorsal and anal fins subvertical; sides spotted above and below. *argus* (229a).
AA. Margins of dorsal and anal fins extending obliquely forward; sides striped above, spotted below. *multifasciatus* (229b).

229a. S. ARGUS. Spotted Butterfish. *Chaetodon argus* Linne, Syst. Nat. 12th ed., 1766, p. 464. *S. argus* Day, Fish. India, 1875, p. 114, pl. 29, 3.

A tropical species, rare in our waters. Length 12 inches.

229b. S. MULTIFASCIATUS. Butterfish. *Id.* Richardson, Ichth. Erebus & Terror, 1846, p. 57, pl. 35, 4-6 (Pl. xxvi).

Plentiful in estuaries of the northern rivers. Length 16 inches.

CVIII. Family Platacidae.

230. Platax Cuvier, R. Anim. ii, 1817, p. 334 (*teira*).

230a. P. TEIRA. Bat Fish. *Chaetodon teira* Forskal, Descr. Anim., 1775, p. 60; *Id.* Bleeker, Atlas Ichth. ix, 1877-8, p. 73, pls. 279, 2 and 382, 1 (Pl. xxvii).

Another tropical species wandering southward into our northern waters. Length 20 inches.

CIX. Family Chaetodontidae.

A. Dorsal spines not increasing in height backward.
  B. Snout produced into a slender beak; 9 dorsal spines. *Chelmon* (231).
  BB. Snout shorter, not beak-like; more than 9 dorsal spines.
    C. Fourth dorsal spine greatly produced and filiform. *Heniochus* (232).
    CC. No elongate spine, the margin of the spines rounded.
      D. Scales minute, more than 70. *Vinculum* (233).
      DD. Scales larger, 35-60.
        E. Second anal spine longer than third. *Microcanthus* (234).
        EE. Second anal spine not longer than third. *Chaetodon* (235).
AA. Dorsal spines increasing in height backward.
  F. Eleven dorsal spines. *Chelmonops* (236).
  FF. Six to seven dorsal spines. *Parachaetodon* (237)

231. CHELMON Cuvier, R. Anim. ii, 1817, p. 334 (*rostratus*).

231a. C. ROSTRATUS. BEAKED CORAL-FISH. *Chaetodon rostratus* Linne, Syst. Nat. 10th ed., 1758, p. 273. *Chelmo rostratus* Day, Fish. India, 1875, p. 110, pl. 28, 2 (Pl. xxvii).

Frequents coral regions. A single specimen is in the Australian Museum from Iluka, Clarence River. Length about 5 inches.

232. HENIOCHUS Cuvier, R. Anim. ii, 1817, p. 335 (*macrolepidotus*).

232a. H. ACUMINATUS. PENNANT CORAL-FISH. *Chaetodon acuminatus* Linne, Syst. Nat. 10th ed., 1758, p. 272. *H. macrolepidotus* Day, Fish. India, 1875, p. 110, pl. 28, 3 (Pl. xxvii).

Another species of coral regions, occasionally reaching the northern waters of the State. Length 18 inches.

233. VINCULUM McCulloch, Biol. Res. Endeavour ii. 3, 1914, p. 110 (*sexfasciatum*).

233a. V. SEXFASCIATUM. *Chaetodon sexfasciatus* Richardson, A.M.N.H. x, 1842, p. 26. *V. sexfasciatum* McCulloch, Biol. Res. Endeavour ii. 3, 1914, p. 110, pl. 22 (Pl. xxvii).

A southern fish, unreliably recorded from New South Wales. Length 10 inches.

234. MICROCANTHUS Swainson, Nat. Hist. Fish. Amphib. Rept. ii, 1839, p. 215 (*strigatus*).

234a. M. STRIGATUS. STRIPEY. *Chaetodon strigatus* Cuv. & Val., H. N. Poiss. vii, 1831, p. 25, pl. 170 (Pl. xxvii).

Plentiful in estuaries along the coast. Length about 6 inches.

235. CHAETODON Linne, Syst. Nat. 10th ed., 1758, p. 272 (*capistratus*).

A. A blackish band extends around bases of dorsal and anal fins, crossing the peduncle; body dark. *flavirostris* (235a).

AA. No such dark band; body light.

B. A dark ocellus on the dorsal fin; one dorsal ray produced. *setifer* (235b).

BB. No ocellus on the dorsal fin and no produced ray. *citrinellus* (235c).

235a. C. FLAVIROSTRIS. CORAL-FISH. *Id.* Gunther, Fische Sudsee i, 1874, p. 41, pl. 32, a.

A specimen 6 inches long, forwarded by the Department of Fisheries to the Australian Museum, is the first of the species to be recognised from New South Wales. It is from Iluka, Clarence River.

235b. C. SETIFER. HAIR-FINNED CORAL-FISH. *Id.* Bloch, Ausl. Fische ix, 1795, p. 101, pl. 426, 1.

A widely distributed and ornate species which occasionally wanders southward into our northern waters. A specimen is in the Australian Museum from Iluka, Clarence River. Length 7 inches.

235c. C. CITRINELLUS. CORAL-FISH. *Id.* Cuv. & Val., H. N. Poiss, vii, 1831, p. 27; *Id.* Valenciennes, R. Anim. Illustr. Poiss., 1843, pl. 39, 1 (Pl. xxvii).

A small tropical species occasionally extending into our waters.

236. CHELMONOPS Bleeker, Arch. Neerl. Sc. Nat. xi, 1876, p. 304 (*truncatus*).

236a. C. TRUNCATUS. *Chaetodon truncatus* Kner, Sitzb. Akad. Wiss. Wien. xxxiv, 1859, p. 442, pl. 2 (Pl. xxvii).

A fairly common species, attaining a length of 8 inches.

237. Parachaetodon Bleeker, Versl. Akad. Amsterdam (2) viii, 1874, p. 371 (*oligacanthus*).

237a. P. ocellatus. *Platax ocellatus* Cuv. & Val., H. N. Poiss. vii, 1831, p. 229. *Parachaetodon ocellatus* Bleeker, Atlas Ichth. ix, 1877, p. 24, pl. 377, 4 (Pl. xxvii).

An occasional wanderer into New South Wales waters.

CX. Family Enoplosidae.

238. Enoplosus Lacep., H. N. Poiss. iv, 1802, p. 540 (*armatus*).

238a. E. armatus. Old Wife. *Chaetodon armatus* Shaw, White's Voy. N.S. Wales, 1790, p. 284, pl. — , 1. *Enoplosus armatus* Stead, Ed. Fish. N.S. Wales, 1908, p. 62, pl. 32 (Pl. xxviii).

A very common fish in harbours and estuaries. Length about 9 inches.

CXI. Family Histiopteridae.

A. Base of spinous dorsal shorter than that of the soft portion.

B. Posterior dorsal spines not longer than the median ones; 2 anal spines *Paristiopterus* (239).

BB. Posterior dorsal spines longest; 3 anal spines. *Zanclistius* (340).

AA. Base of spinous dorsal longer than that of the soft portion. *Pentaceropsis* (241).

239. Paristiopterus Bleeker, Arch. Neerl. Sci. Nat. xi, 1876, p. 268 (*insignis*).

239a. P. labiosus. Giant Boar-fish. *Histiopterus labiosus* Gunther, P.Z.S. 1871, p. 658, pl. 59. *H. farnelli* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 116, pl. 27 (Pl. xxviii).

A fine edible fish, reaching a length of 2 feet.

240. Zanclistius Jordan, P.U.S. Nat. Mus. xxxii, 1907, p. 236 (*elevatus*).

240a. Z. elevatus. Spotted Boar-fish. *Histiopterus elevatus* Ramsay & Ogilby, P.L.S. N.S.W. (2) iii, 1888, p. 1311; *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 114, pl. 26 (Pl. xxviii).

A common species in deep water, where it is taken by the trawlers. Length 12 inches.

241. Pentaceropsis Steindachner, Denk. Akad. Wiss. Wien xlviii, 1883, p. 13 (*recurvirostris*).

241a. P. recurvirostris. Long-snouted Boar-fish. *Histiopterus recurvirostris* Richardson, Ichth. Erebus & Terror, 1845, p. 34. *Prosoplismus recurvirostris* Waite, Rec. Austr. Mus. v, 1903, p. 58, pl. 6 (Pl. xxviii).

A southern species, growing to about 20 inches long.

CXII. Family Cepolidae.

242. Cepola Linne, Syst. Nat. 12th ed., 1766, p. 445 (*taenia*).

242a. C. australis. Band-fish. *Id.* Ogilby, P.L.S. N.S.W. xxiv, 1899, p. 185; *Id.* McCulloch, Biol. Res. Endeavour ii. 3, 1914, p. 109, pl. 34, 1 (Pl. xxviii).

A rare species, pink in colour, and growing to 10 inches long.

CIRRHITIFORMES.

Percoid fishes which usually have some of the lower pectoral rays simple and thickened.

A. 10 dorsal spines. Fam. *Cirrhitidae* (cxiii).
AA. 14-22 dorsal spines.
B. Teeth compressed, tricuspid or lanceolate. Fam. *Aplodactylidae* (cxiv).
BB. Teeth conical, acute.
C. Scales small, about 100; 36 or more dorsal rays. Fam. *Latrididae* (cxvii).
CC. Scales larger; less than 36 dorsal rays.
D. Vomer toothless. Fam. *Cheilodactylidae* (cxvi).
DD. Vomer with teeth. Fam. *Chironemidae* (cxv).

CXIII. Family CIRRHITIDAE.

243. CIRRHITICHTHYS Bleeker, Nat. Tijd. Nederl. Ind. x, 1856, p. 474 (*graphidopterus*).

243a. C. APRINUS. *Cirrhites aprinus* Cuv. & Val., H. N. Poiss. iii, 1829, p. 76. *Cirrhitichthys aprinus* Bleeker, Atlas. Ichth. viii, 1877, p. 146, pl. 303, 1 (Pl. xxix).

A single specimen taken in Port Jackson was only a straggler from the tropics. Length 5 inches.

CXIV. Family APLODACTYLIDAE.

244. CRINODUS Gill, P. Acad. N. Sci. Philad. 1862, p. 110 (*lophodon*).

244a. C. LOPHODON. ROCK CALE. *Haplodactylus lophodon* Gunther, B.M. Cat. Fish. i, 1859, p. 435. *H. obscurus* Castelnau, P.L.S. N.S.W. iii, 1879, p. 374.

Plentiful around rocky reefs in deep water. Length 18 inches.

CXV. Family CHIRONEMIDAE.

245. CHIRONEMUS Cuv. & Val., H. N. Poiss. iii, 1829, p. 78 (*georgianus*).

245a. C. MARMORATUS. KELP FISH. *Id.* Gunther, B.M. Cat. Fish. ii, 1860, p. 76; *Id.* Ogilby, Ed. Fish. N.S. Wales, 1893, p. 54, pl. 17 (Pl. xxix).

Plentiful among weed covered rocks along the coast. Length 14 inches.

CXVI. Family CHEILODACTYLIDAE.

A. Anal fin almost oblong, with 12 or more rays. *Dactylopagrus* (246).
AA. Anal fin with less than 12 rays, the anterior much higher than the posterior.
B. Cheeks naked. *Dactylophora* (247).
BB. Cheeks scaly. *Cheilodactylus* (248).

246. DACTYLOPAGRUS Gill, P. Ac. N. Sci. Philad. 1862, p. 114 (*carponemus*).

A. A dark nuchal band from the back to the shoulder. *macropterus* (246a).
AA. No such dark band. *morwong* (246b).

246a. D. MACROPTERUS. JACKASS-FISH. *Cichla macroptera* Bloch & Schneider, Syst. Ichth., 1801, p. 342. *Dactylosparus macropterus* McCulloch, Biol. Res. Endeavour i. 1, 1911, p. 66, pl. 12 (Pl. xxix).

A southern fish, abundant in deep water. Length 2 feet.

246b. D. MORWONG. MORWONG. *Chilodactylus morwong* Ramsay & Ogilby, P.L.S. N.S.W. (2) i, 1886, p. 879. *C. carponemus* Ogilby, Ed. Fish. N.S.W., 1893, p. 55, pl. 18—not *C. carponemus* Cuv. & Val.

Commonly confused with the preceding species. Length about 2 feet.

247. Dactylophora De Vis, P.L.S. N.S.W. viii, 1883, p. 284 (*semimaculata*).

247a. D. nigricans. Dusky Morwong. *Chilodactylus nigricans* Richardson, F.Z.S. 1850, p. 63. *C. nebulosus* Steindachner, Sitzb. Akad. Wiss. Wien lxxxviii. I, 1884, p. 1078, pl. 2.1 (Pl. xxix).

A southern fish, growing to about 2 feet long.

248. Cheilodactylus Lacep., H. N. Poiss. v, 1803, p. 5 (*fasciatus*).

A. Margin of spinous dorsal evenly convex. subg *Cheilodactylus*.
B. 31-33 dorsal rays; body nearly uniform. *fuscus* (248a).
BB. 26-27 dorsal rays; body with brown cross bands. *spectabilis* (248b).
AA. Spinous dorsal elevated in front. subg. *Goniistius*.
C. Body white, with oblique blackish bands. *gibbosus* (248c).

248a. C. fuscus. Red Morwong. *Id.* Castelnau, P.L.S. N.S.W. iii, 1879, p. 376; *Id.* Roughley, Fish. Austr., 1916, p. 125, pl. 40 (Pl. xxix).

A fine food fish, common around sunken reefs. Length 15 inches.

248b. C. spectabilis. Brown-banded Morwong. *Id.* Hutton, Fish. N. Zealand, 1872, p. 8, and T. N. Zeal. Inst. v, 1873, p. 259, pl. 7, 11.

A southern fish, not common in New South Wales. Length about 2 feet.

248c. C. Goniistius gibbosus. Magpie Morwong. *Chilodactylus gibbosus* Richardson, P.Z.S. 1841, p. 21. *Goniistius gibbosus* Stead, Ed. Fish. N.S. Wales, 1908, p. 72, pl. 41 (Pl. xxix).

Not uncommon in inlets along the coast, but not often captured by line fishermen. Length 12 inches.

CXVII. Family Latrididae.

A. Vomer with teeth; median pectoral rays longest. *Latris* (249).
AA. Vomer toothless; upper pectoral rays longest. *Latridopsis* (250).

249. Latris Richardson, P.Z.S. 1839, p. 99 (*hecateia*).

249a. L. lineata. Tasmanian Trumpeter. *Cichla lineata* Bloch & Schneider, Syst. Ichth., 1801, p. 342. *Latris hecateia* Richardson, Tr. Zool. Soc. iii, 1842, p. 106, pl. 6, 1 (Pl. xxix).

Said to occur in the southern waters of New South Wales, but not reliably recorded. Length about 40 inches.

250. Latridopsis Gill, P. Acad. N. Sci. Philad. 1862, p. 114 (*ciliaris*).

250a. L. forsteri. Bastard Trumpeter. *Latris forsteri* Castelnau, P. Zool. Soc. Viet. i, 1872, p. 77. *Latridopsis forsteri* McCulloch, Biol. Res. Endeavour iii. 3, 1915, p. 146, pl. 27 (Pl. xxix).

A southern fish, occurring in deeper water in New South Wales. Length about 2 feet.

CXVIII. Pomacentriformes.
Family Pomacentridae.

Small ornate fishes, plentiful in tropical waters, which have but a single nostril on each side of the snout. The lower pharyngeals are ankylosed to form a single bone.

A. Teeth usually compressed, sometimes subcylindrical.
  B. Posterior edge of preoperculum serrated.
    C. Spinous dorsal fin scaly like the soft portion. *Pomacentrus* (251).
    CC. Spinous dorsal fin naked. *Daya* (252).
  BB. Posterior edge of preoperculum smooth.
    D. 30 or less scales in a longitudinal row. *Glyphisodon* (253).
    DD. More than 30 scales in a longitudinal row. *Parma* (254).
AA. Teeth conical. *Chromis* (255).

251. POMACENTRUS Lacep., H. N. Poiss. iv, 1803, p. 505 (*pavo*).

251a. P. UNIFASCIATUS. *Id.* Steindachner, Sitzb. Akad. Wiss. Wien. lvi. 1, 1867, p. 326.

A little known species which has not been recognised since first described. Length 7½ inches.

252. DAYA Bleeker, Verh. Holl. Mij. Haarlem, 1877, p. 71 (*jerdoni*).

252a. D. JERDONI. *Pomacentrus jerdoni* Day, P.Z.S. 1873, p. 237, and Fish. India, 1877, p. 383, pl. 80, 7. *P. dolii* Macleay, P.L.S. N.S.W. vi, 1881, p. 65, pl. i, 1.

The types of *P. dolii* in the Macleay Museum, prove to be similar in all details to specimens from Queensland which I identify as *D. jerdoni*. They were doubtless stragglers from the northern waters. Length 4½ inches.

253. GLYPHISODON Lacep., H. N. Poiss. iv, 1803, p. 542 (*moucharra*).

A. Teeth strongly compressed; colouration not uniform.
  B. Body light, with 5 darker cross bands. *saxatilis* (253a).
  BB. Body dark, with 1 light cross band; a dark ocellus on the dorsal fin. *leucozona* (253b).
AA. Teeth subcylindrical; body uniformly coloured. *immaculatus* (253c).

253a. G. SAXATILIS. BANDED DEMOISELLE. *Chaetodon saxatilis* Linné, Syst. Nat. 10th ed., 1758, p. 276. *Glyphidodon coelestinus* Bleeker, Atlas Ichth. ix, 1877, pl. 408, 5 (Pl. xxviii).

A common tropical species, which sometimes extends southward to Sydney. Length 6 inches.

253b. G. LEUCOZONA. *Id.* Bleeker, Nat. Tijd. Ned. Ind. xix, 1859, p. 338, and Atlas Ichth. ix, 1877, pl. 407, 2.

A small species, only once taken near Sydney.

253c. G. IMMACULATUS. BLUE PULLER. *Heliastes immaculatus* Ogilby, P.L.S. N.S.W. x, 1886, p. 446; *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 86, pl. 14 (Pl. xxviii).

This species is apparently better associated with the genus *Glyphisodon* than with *Heliastes*, though its teeth are less compressed than is usual in the former genus. Length 6 inches.

(Two small specimens recorded as *G. uniocellatus* Quoy & Gaimard, from Sydney, by Steindachner, Sitzb. Akad. Wiss. Wien. lvi. 1, 1867, p. 328, were doubtless incorrectly identified).

254. PARMA Gunther, Brit. Mus. Cat. Fish. iv, 1862, p. 57 (*microlepis*).

254a. P. MICROLEPIS. WHITE-EAR. *Id.* Gunther, *Loc. cit.*, p. 58. *Hypsypops microlepis* Waite, Rec. Austr. Mus. vi. 2, 1905, p. 67, pl. 12, 1-3 (Pl. xxviii).

Common among rocks. The young are orange with broad blue bands above, but the adults are black with a white patch on the gill-covers. Length 7 inches.

255. CHROMIS Cuvier, Mem. Mus. Hist. Nat. Paris i, 1815, p. 353 (*chromis*).
255a. C. HYPSILEPIS. BROWN PULLER. *Heliastes hypsilepis* Gunther. A.M.N.H. (3) xx, 1867, p. 66. *Chromis hypsilepis* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 73, pl. 14 (Pl. xxviii).
Not uncommon around rocky places on the coast. Length 7½ inches.

DIVISION LABRIFORMES. PARROT-FISHES.

Percoid fishes, usually brilliantly coloured, and characterised by having the lower pharyngeals ankylosed to form a single bone; two nostrils are present on each side of the snout.

A. Anterior teeth of jaws separate, lateral teeth usually separate from one another. Fam. *Labridae* (cxix).
AA. Teeth of jaws coalesced to form sharp edged plates.
B. Dorsal fin with 15-24 spines, ventrals with 4 rays. Fam. *Neoodacidae* (cxx).
BB. Dorsal fin with 9 spines, ventrals with 5 rays. Fam. *Scaridae*.

CXIX. Family LABRIDAE.

A. Lateral teeth of jaws free, not confluent.
B. 8-9 dorsal spines.
C. Operculum scaly.
D. 11 dorsal rays.
E. Margin of spinous dorsal with free points behind each spine *Pseudolabrus* (256).
EE. Margin of spinous dorsal without such free points. *Pictilabrus* (257).
DD. 12 dorsal rays. *Eupetrichthys* (258).
CC. Operculum naked.
F. Lateral line interrupted; forehead elevated and sharp edged. *Novaculichthys* (259).
FF. Lateral line continuous; forehead not elevated or sharp edged.
G. Scales larger, less than 40 in a longitudinal row.
H. 9 dorsal spines. *Halichoeres* (260).
HH. 8 dorsal spines. *Thalassoma* (261).
GG. Scales smaller, more than 40 in a longitudinal row.
I. A few small scales behind eye; lateral line less than 60. *Ophthalmolepis* (262).
II. No scales behind eye; lateral line more than 60. *Coris* (263).
AA. Some of the lateral teeth united to form a bony ridge on each side.
J. 13 dorsal spines. *Choerodon* (264).
JJ. 11-12 dorsal spines.
K. 45 or more scales on the lateral line. *Achoerodus* (265).
KK. 37 or less scales on the lateral line.
L. Whole upper lip exposed when mouth is closed; snout obtuse. *Lepidaplois* (266).
LL. Upper lip hidden posteriorly beneath preorbital when mouth is closed; snout slender. *Verreo* (267).

256. PSEUDOLABRUS Bleeker, P. Zool. Soc. 1861 (1862), p. 415 (*rubiginosus*).
A. Cheek-scales in 4 or more rows, extending forward to below middle of eye.
B. Dorsal and anal fins with large scales covering their bases.
C. Broad bands from the snout and interorbital space passing through the eye onto the body. *guntheri* (256a).
CC. Only narrow bands radiating from the eye, sometimes wanting. *luculentus* (256b).
BB. Dorsal and anal fins without scaly bases. *celidotus* (256c).
AA. Cheek-scales in 1-3 rows, rarely 4 rows, usually confined to postorbital portion of head.
D. Cheek-scales in 1 row above, usually 3 below. *tetricus* (256d).
DD. Cheek-scales in 1 row. *gymnogenis* (256e).

256a. P. GUNTHERI. *Id.* Bleeker, Versl. Akad. Amsterdam xiv, 1862, p. 130; *Id.* McCulloch, Rec. Austr. Mus. ix. 3, 1913, p. 368, pl. 17 (Pl. xxx).

An uncommon species, most plentiful towards the northern border of the State. Length about 7 inches.

256b. P. LUCULENTUS. *Labrus luculentus* Richardson, Ichth. Erebus & Terror, 1848, p. 130. *P. luculentus* Waite, Rec. Austr. Mus. v. 1, 1903. p. 29, pl. 4, 1.

Occasionally captured in New South Wales, but more plentiful at Lord Howe Island. Length about 8 inches.

256c. P. CELIDOTUS. *Labrus celidotus* Bloch & Schneider, Syst. Ichth., 1801, p. 133; *Id.* Richardson, Ichth. Erebus & Terror, 1846, p. 53, pl. 31, 1-5.

This species has been recorded from New South Wales, but proof of its occurrence here is required.

256d. P. TETRICUS. LILAC-BANDED PARROT-FISH. *Labrus tetricus* Richardson, P. Zool. Soc. 1840, p. 25. *Pseudolabrus tetricus* McCulloch, Rec. Austr. Mus. ix. 3, 1913, p. 377, pl. 19. *P. cyanogenys* McCulloch, Zool. Res. Endeavour i. 1, 1911, p. 76, pl. 13 (Pl. xxx).

An exceedingly variable species, altering greatly in both form and colour in changing from the young to the adult. Length about 18 inches.

256e. P. GYMNOGENIS. WHITE-SPOTTED PARROT-FISH. *Labrichthys gymnogenis* Gunther, Brit. Mus. Cat. Fish. iv., 1862, p. 117. *Pseudolabrus gymnogenis* McCulloch, Rec. Austr. Mus. ix. 3, 1913, p. 381, pl. 20.

Another species which undergoes great changes with growth. The adult form is known as the Crimson-banded Parrot-fish. Length 12 inches.

(*Labrus cyprinaceus* Shaw, White's Voy. N.S. Wales, 1790, p. 264, pl. 1, is apparently a species of *Pseudolabrus*, but is too briefly characterised to be identified).

257. PICTILABRUS Gill, Proc. U.S. Nat. Mus. xiv., p. 403 (*laticlavius*).

257a. P. LATICLAVIUS. GREEN-BANDED PARROT-FISH. *Labrus laticlavius* Richardson, P. Zool. Soc. 1839, p. 99, and Ichth. Erebus & Terror, 1848, p. 128, pl. 56, 3-6 (Pl. xxx).

Common among weed covered rocks, and characterised by its green colour with two purple longitudinal stripes on the sides. Length about 8 inches.

258. EUPETRICHTHYS Ramsay & Ogilby, P.L.S. N.S.W. (2) ii, 1888, p. 631 (*angustipes*).

258a. E. ANGUSTIPES. SLENDER PARROT-FISH. *Id.* Ramsay & Ogilby, *Tom. cit.*, p. 632; *Id.* McCulloch, Rec. Austr. Mus. ix. 3, 1913, p. 365, pl. 15, (Pl. xxx.).

A rare species, known only from three specimens from near Sydney. Length 6 inches.

259. NOVACULICHTHYS Bleeker, Proc. Zool. Soc. 1861 (1862), p. 414 (*taeniurus*).

259a. N. JACKSONENSIS. KEEL-HEADED PARROT-FISH. *Novacula jacksonensis* Ramsay, P.L.S. N.S.W. vi, 1881, p. 198. *Novaculichthys jacksonensis* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 87, pl. 15 (Pl. xxx).

A rare species, about 8 inches long.

260. HALICHOERES Ruppell, Neue Wirbelth. Fische, 1837, pp. 10, 17 (*bimaculatus*).

H. poecilus Richardson, *H. centiquadrus* Lacepede, and *H. trimaculatus* Quoy and Gaimard, have been recorded from Port Jackson, the first by Steindachner, Sitzb. Akad. Wiss. Wien liii, 1866, p. 463, the second by Waite, Rec. Austr. Mus. iv, 1901, p. 54, and the third by Kner, Novara Zool. i, Fische, 1865, p. 255. All are tropical fishes, and further proof of their occurrence on the coast of New South Wales is needed.

261. THALASSOMA Swainson, Nat. Hist. Fish. Amphib. Rept. ii, 1839, p. 224 (*purpurea*).

261a. T. LUNARIS *Labrus lunaris* Linne, Syst. Nat. 10th ed., 1758, p. 283. *Julis lunaris* Bleeker, Atlas Ichth. i, 1862, p. 90, pl. 33, 5.

Another tropical species, of which the only record from Port Jackson is quite unreliable.

262. OPHTHALMOLEPIS Bleeker, P. Zool. Soc. 1861 (1862), p. 413 (*lineolatus*).

262a. O. LINEOLATUS. MAORI. *Julis lineolatus* Cuv. & Val., H. N. Poiss. xiii, 1839, p. 436. *O. lineolatus* Kner, Novara Zool. i, Fische, 1865, p. 258, pl. 11, 1 (Pl. xxx).

A common fish in the vicinity of sunken reefs. Length 16 inches.

263. CORIS Lacep., H. N. Poiss. iii, 1802, p. 96 (*aygula*).

A. A black comb-like band from snout to tail. *picta* (263a).
AA. Two dark transverse bands on anterior part of body. *sandeyeri* (263b).

263a. C. PICTA. *Labrus pictus* Bloch & Schneider, Syst. Ichth., 1801, p. 251, pl. 55. *C. picta* Waite, Rec. Austr. Mus. v, 1903, p. 26, pl. 5, 1 (Pl. xxx.).

Not uncommon around wharf-piles in harbours, and plentiful on the reef at Lord Howe Island. Length 9 inches.

263b. C. SANDEYERI. KING PARROT-FISH. *Cymolutes sandeyeri* Hector, Trans. N. Zeal. Inst. xvi., 1884, p. 323. *C. rex* McCulloch, Rec. Austr. Mus. xiii. 2, 1920, p. 67, pl. 14, 2.

A rare species, reaching a length of 26 inches.

264. CHOERODON Bleeker, Nat. Geneesk. Arch. Nederl. Indie iv, 1847, p. 10 (*macrodontus*).

264a. C. VENUSTUS. BLUE-SPOTTED GROPER. *Choerops venustus* De Vis, Proc. Roy. Soc. Qld. i, 1885, p. 147. *Choerodon ommopterus* Roughley, Fish. Austr. 1916, p. 150, pl. 50 (Pl. xxx.).

A northern species, forwarded to Sydney from the Clarence and Richmond River estuaries. Length nearly 3 feet.

264b. C. MACLEAYI. *Choerops macleayi* Ramsay & Ogilby, P.L.S. N.S.W. (2) ii., 1887, p. 241.

Known only from a single example 5½ inches long, which is perhaps merely the young of *C. venustus*.

265. ACHOERODUS Gill, P. Acad. N. Sci. Philad. 1863, p. 222 (*gouldii*).

265a. A. GOULDII. BLUE GROPER. *Labrus gouldii* Richardson, A.M.N.H. xi, 1843, p. 353. *Platychoerops mulleri* Klunzinger, Sitzb. Akad. Wiss. Wien lxxx. i, 1879, p. 399, pl. 8, 2 (Pl. xxx.).

A valuable food-fish occurring around rocky coasts, and reaching a length of about 3½ feet.

The name *Trochocopus unicolor* Gunther, A.M.N.H. (4) xvii, 1876, p. 398, was based upon a stuffed skin from Port Jackson, which is probably not distinct from the Blue Groper.

Heterochoerops viridis Steindachner, Sitzb. Akad. Wiss. Wien liii, 1866, p. 461, pl. 5, 3, is evidently the very young form of *Achoerodus*, in which the preopercular margin is strongly serrated, and the tubes of the lateral line are simple instead of arborescent.

265b. A. BADIUS. BROWN GROPER. *Platychoerops badius* Ogilby, Ed. Fish. N.S. Wales, 1893, p. 134.

This is probably only a colour variation of the preceding species.

266. LEPIDAPLOIS Gill, P. Acad. N. Sci. Philad. 1862, p. 140 (*axillaris*).

266a. L. VULPINUS. *Cossyphus vulpinus* Richardson, P. Zool. Soc. 1850, p. 71. *Harpe vulpina* Waite, Rec. Austr. Mus. iv, 1902, p. 269, pl. 42 (Pl. xxx).

A rare species in New South Wales waters. Length 16 inches.

267. VERREO Jordan & Snyder, Proc. U.S. Nat. Mus. xxiv, 1902, p. 619 (*oxycephalus*).

A. A large dark spot on the spinous dorsal; body without rows of crimson spots. *oxycephalus* (267a).

AA. No dark spot on the spinous dorsal; 3 rows of crimson spots on each side of body. *bellis* (267b).

267a. V. OXYCEPHALUS. PIG-FISH. *Cossyphus oxycephalus* Bleeker, Versl. Akad. Amsterdam xiv, 1862, p. 129. *V. oxycephalus* Jordan & Snyder, Proc. U.S. Nat. Mus. xxiv, 1902, p. 619, fig. 3 (Pl. xxx).

Lives around sunken reefs, and grows to 15 inches long.

267b. V. BELLIS. BANDED PIG-FISH. *Cossyphus bellis* Ramsay & Ogilby, P.L.S. N.S.W. (2) ii, 1887, p. 561. *Diastodon bellis* Stead, Ed. Fish. N.S. Wales, 1908, p. 82, pl. 51.

Probably only a colour variety of the preceding species.

CXX. Family NEOODACIDAE.

A. Cheeks scaly. *Neoodax* (268).

AA. Cheeks naked.

B. Dorsal originating above operculum; scales about 30. *Heteroscarus* (269).

BB. Dorsal originating above pectoral; scales about 50. *Olisthops* (270).

268. NEOODAX Castelnau, Res. Fish. Austr. (Viet. Offic. Rec. Philad. Exhib), 1875, p. 37 (*waterhousii*).

The status of the older name *Odax*, which has been allotted to three different genera by Lacepede, Cuvier, and Cuvier and Valenciennes, is so uncertain that it seems to be preferable to use Castelnau's name.

A. About 60 scales on the lateral line. *semifasciatus* (268a).

AA. 30-45 scales on the lateral line.

B. Lateral line about 40. *balteatus* (268b).

BB. Lateral line about 45. *obscurus* (268c).

268a. N. SEMIFASCIATUS. ROCK WHITING. *Odax semifasciatus* Cuv. & Val., H. N. Poiss. xiv, 1839, p. 299, pl. 407. *Odax richardsonii* Gunther, Brit. Mus. Cat. Fish. iv, 1862, p. 241; *Id.* Roughley, Fish. Austr., 1916, p. 159, pl. 55 (Pl. xxxi.).

Common along the southern portion of the coast, and reaching a length of 14 inches. There seems to be nothing to distinguish *N. richardsonii* from *N. semifasciatus*.

268b. N. BALTEATUS. LITTLE ROCK WHITING. *Odax balteatus* Cuv. & Val., H. N. Poiss. xiv, 1839, p. 303.

Not uncommon on Zostera flats in Port Jackson. Length 7 inches.

An examination of the holotype of *Odax brunneus* Macleay, shows that it has 38-39 scales on the lateral line, not 30 as described, and that it does not differ from *N. balteatus*.

268c. N. OBSCURUS. *Odax obscurus* Castelnau, P. Zool. Soc. Viet. i, 1872, p. 154.

Probably synonymous with the preceding species.

269. OLISTHOPS Richardson, P. Zool. Soc. 1850, p. 75 (*cyanomelas*).

269a. O. CYANOMELAS. HERRING CALE. *Id.* Richardson, *Ibid.*, pl. 3, 1-2; *Id.* McCulloch, Rec. Austr. Mus. xiii. 2, 1920, pl. 14, 3 (Pl. xxxi.).

A rock fish which exhibits great colour variation, the male being usually blackish, while the females are ornamented as in the accompanying figure. Length about 12 inches.

270. HETEROSCARUS Castelnau, P. Zool. Soc. Viet. i, 1872, p. 245 (*filamentosus*).

270a. H. FILAMENTOSUS. RAINBOW-FISH. *Id.* Castelnau, *Ibid.; Id.* Steindachner, Sitzb. Akad. Wiss. Wien lxxxviii. i, 1883, p. 1093, pl. 3, 1 (Pl. xxxi.).

A gorgeously coloured fish which is not uncommon around rocky reefs on the southern portion of the coast. Length about 9 inches.

(*Pseudoscarus octodon* Bleeker has been incorrectly recorded from Port Jackson by Kner, Novara Zool. i, Fische, 1865, p. 262. No member of the family Scaridae is known from the State).

GADOPSIFORMES.

CXXI. Family GADOPSIDAE.

271. GADOPSIS Richardson, Ichth. Erebus & Terror, 1848, p. 122 (*marmoratus*).

271a. G. MARMORATUS. RIVER BLACKFISH. *Id.* Richardson, *Ibid.*, pl. 59, 6-11. *Id.* Ogilby, Mem. Qld. Mus. ii., 1913, p. 69, pl. xx. (Pl. xxxi.).

Occurs in the western rivers of New South Wales, and occasionally reaches 15 inches in length.

CHAMPSODONTIFORMES.

CXXII. Family CHAMPSODONTIDAE.

272. CHAMPSODON Gunther, P. Zool. Soc. 1867, p. 102 (*vorax*).

The type of *Centropercis nudivittis* Ogilby apparently offers no characters to separate it from *Champsodon*.

272a. C. NUDIVITTIS. *Centropercis nudivittis* Ogilby, P.L.S. N.S.W. (2) x, 1895, p. 320; *Id.* Waite, Mem. Austr. Mus. iv. i, 1899, p. 111, pl. 11, 2 (Pl. xxxii.).

A rare species living in moderate depths on muddy ground. Length 4 inches.

TRACHINIFORMES.

A. Dorsal fin with an anterior spinous portion.

B. Lateral line incomplete, not reaching the tail. Fam. *Opisthognathidae* (cxxiii.).

BB. Lateral line complete, reaching the tail. Fam. *Pinguipedidae* (cxxiv.).

AA. Dorsal fin without spines.

C. Palate toothless; lateral line near lower surface of body. Fam. *Creediidae* (cxxv.).

CC. Palate with teeth.

D. Lateral line extending along middle or lower half of body.
E. Mandible not projecting beyond upper jaw.
Fam. *Limnichthyidae* (cxxvi.).
EE. Mandible projecting beyond upper jaw.
Fam. *Leptoscopidae* (cxxvii.).
DD. Lateral line extending along upper part of body.
Fam. *Uranoscopidae* (cxxviii.).

CXXIII. Family OPISTHOGNATHIDAE.

273. MEROGYMNUS Ogilby, P. Roy. Soc. Qld. xxi., 1908, p. 18 (*eximius*).

273a. M. JACKSONIENSIS. LEOPARD FISH. *Opisthognathus jacksoniensis* Macleay, P.L.S. N.S.W., v., 1881, p. 570. *Gnathypops jacksoniensis* Waite, Rec. Austr. Mus. v., 1904, p. 240, pl. 26, 2 (Pl. xxxi.).

An ornate and rare fish, growing to 10 inches long.

CXXIV. Family PINGUIPEDIDAE.

274. PARAPERCIS Bleeker, Nederl. Tijdschr. Dierk. i, 1863, p. 236 (*cylindrica*).
A. Posterior dorsal spines not shorter than the preceding ones. Subg. Neopercis.
B. Lateral line not following curve of back.
C. Cross-bars of back distinct; no dark blotches below lateral line. *binivirgata* (274a).
CC. Cross-bars of back indistinct; five dark blotches below lateral line *ramsayi* (274b).
BB. Lateral line following curve of back; back with cross bars. *allporti* (274c).
AA. Last dorsal spine shorter than the preceding ones. Subg. *Chilias*.
D. Narrow blue-lines between eyes and across snout. *nebulosus* (274d).

274a. P. BINIVIRGATA. GRUB-FISH. *Neopercis binivirgata* Waite, Rec. Austr. Mus. v, 1904, p. 236, pl. 25, 3 (Pl. xxxi.).

A rare species of which few specimens are known. Length 8 inches.

274b. P. RAMSAYI. *Id.* Steindachner, Sitzb. Akad. Wiss. Wien. lxxxviii., 1, 1884, p. 1072. *Parapercis novae-cambriae* Waite, Mem. Austr. Mus. iv., 1, 1899, p. 111, pl. 25 (Pl. xxxi.).

Another fish which has been rarely taken. Length 8 inches.

274c. P. ALLPORTI. *Percis allporti* Gunther, A.M.N.H. (4) xvii., 1876, p. 394. *P. ocularis* Waite, Mem. Austr. Mus. iv., 1, 1899, p. 109, pl. 24.

Plentiful in deep water, where it is commonly taken by trawlers. Length 13 inches.

274d. P. NEBULOSUS. *Percis nebulosus* Quoy & Gaimard, Voy. Uranie, 1825, p. 349. *Percis emeryana* Richardson, Icones Piscium, 1843, p. 4, pl. 1, 1.

A tropical species occasionally extending southward to Port Jackson. Length 11 inches.

CXXV. Family CREEDIIDAE.

275. CREEDA Ogilby, P.L.S. N.S.W., xxiii., 1898, p. 298 (*clathrisquamis*).

275a. C. HASWELL. *Hemerocoetes haswelli* Ramsay, P.L.S. N.S.W., vi., 1881, p. 575. *C. clathrisquamis* Waite, Mem. Austr. Mus., iv., 1, 1899, p. 63, fig. 6 (Pl. xxxi.).

A small and rare species taken by the dredge or trawl. Length 2 inches.

CXXVI. Family LIMNICHTHYIDAE.

A. Vomer toothless; pectoral rays uniform. *Limnichthys* (276).
AA. Vomer with teeth; lower pectoral rays thickened and modified. *Schizochirus* (277).

276. LIMNICHTHYS Waite, Rec. Austr. Mus. v. 3, 1904, p. 178 (*fasciatus*).
276a. L. FASCIATUS. *Id.* Waite, *Ibid,* pl. 23, 4 (Pl. xxxi.).
A minute fish not uncommon in sandy pools along the coast. Length under two inches.

277. SCHIZOCHIRUS Waite, Rec. Austr. Mus. v. 4, 1904, p. 241 (*insolens*).
277a. S. INSOLENS. *Id.* Waite, *Ibid,* p. 242, pl. 26, 3 (Pl. xxxi.).
Known only from two specimens about 2½ inches long.

CXXVII. Family LEPTOSCOPIDAE.

A. Scales larger, about five between lateral line and back. *Crapatalus* (278).
AA. Scales smaller, more than 5 between lateral line and back. *Leptoscopus* (279).

278. CRAPATALUS Gunther, A.M.N.H. (3) vii., 1861, p. 86 (*novae-zelandiae*).
278a. C. ARENARIUS. SAND-FISH. *Id.* McCulloch, P.L.S. N.S.W., xl., 2, 1915, p. 269, pl. 37, 1 (Pl. xxxii.).
A small species 3½ inches long, which burrows in the sand of our coastal beaches.

279. LEPTOSCOPUS Gill, P. Acad. N. Sci. Philad. 1859, p. 133 (*macropygus*).
279a. L. MACROPYGUS. *Uranoscopus macropygus* Richardson, Ichth. Erebus & Terror, 1846, p. 55, pl. 33, 4-6 (Pl. xxxii.).
Though the type specimen was said to have been obtained in Port Jackson, the species has not since been recognised from Australian waters. It reaches a length of 2 feet in New Zealand.

CXXVIII. Family URANOSCOPIDAE.

A. Humeral region with a fringed appendage; body scaly. *Ichthyscopus* (280).
AA. Humeral region without a fringed appendage.
B. Chin with free dilatations of the mandible; body minutely scaly. *Gnathagnus* (281).
BB. Chin without free dilatations of the mandible; body naked. *Kathetostoma* (282).

280. ICHTHYSCOPUS Swainson, Nat. Hist. Fish. Amph. Rept. ii., 1839, p. 269 (*inerme*).
280a. I. LEBECK. STARGAZER. *Uranoscopus Le Beck,* Bloch & Schneider, Syst. Ichth., 1801, p. 47. *U. inermis* Valenciennes, Illustr. Poiss. Cuv. R. Anim. 1843, p. 52, pl. 17, 3 (Pl. xxxii.).
Not uncommon, but not generally captured on account of its habit of burying itself in sand or mud. Length 15 inches.

281. GNATHAGNUS Gill, P. Acad. N. Sci. Philad. 1861, p. 115 (*elongatus*).
281a. G. INNOTABILIS. *Id.*..Waite, Rec. Austr. Mus. v., 1904, p. 238, pl. 26, 1 (Pl. xxxii.).
Not uncommon in moderately deep water, where it is captured by the trawlers. Length 14 inches.

282. KATHETOSTOMA Gunther, Brit. Mus. Cat. Fish. ii., 1860, p. 231 (*laeve*).
282a. K. LAEVE. STONELIFTER. *Uranoscopus laevis* Bl. Schn., Syst. Ichth., 1801, p. 47, pl. 8. *K. laeve* Waite & McCulloch, Tr. Roy. Soc. S. Austr. xxxix., 1915, p. 471, pl. 13, 3.
A southern species, which burrows in mud or sand. Length 20 inches.

NOTOTHENIIFORMES.

CXXIX. Family BOVICHTIIDAE.

A. Head and body scaly. *Pseudaphritis* (283).
AA. Head and body naked. *Bovrichtus* (284).

283. PSEUDAPHRITIS Castlenau, P. Zool. Soc. Viet., i., 1872, p. 92 (*bassi*).

283a. P. URVILLII. *Aphritis urvillii* Cuv. & Val., H.N. Poiss. viii., 1831, p. 484, pl. 243 (Pl. xxxii.).

A southern species, said to occur in both fresh and salt water. Length 12 inches.

(*Eleginus bursinus* Cuv. & Val., H.N. Poiss., v., 1830, p. 161, which was said to have been taken in Port Jackson, has not been recognised since it was first described, and its affinities are unknown).

284. BOVICHTUS Cuv. & Val., H.N. Poiss., viii., 1831, p. 486 (*diacanthus*).

284a. B. VARIEGATUS. *Bovichthys variegatus* Richardson, Ichth. Erebus & Terror, 1846, p. 56, pl. 34, 1-4 (Pl. xxxii.).

A New Zealand species, said to have been originally obtained in Port Jackson, but which has not since been taken in N.S. Wales.

CALLIONYMIFORMES.

CXXX. Family CALLIONYMIDAE.

285. CALLIONYMUS Linne, Syst. Nat. 10th. ed. 1758, p. 249 (*lyra*).

A. Preopercular spine with a basal antrorse barb below; dorsal rays mostly simple. *calcaratus* (285a).
AA. Preopercular spine without a basal antrorse barb below; dorsal rays mostly branched.
B. Preopercular spine with 2 terminal hooks.
C. 7-8 anal rays. *calauropomus* (285b).
CC. 6 anal rays. *papilio* (285d).
B. Preopercular spine with 3 hooks above. *phasis* (285c).

285a. C. CALCARATUS. STINK-FISH. *Id.* Macleay, P.L.S. N.S.W., v., 1881, p. 628.

Not rare in Port Jackson, and remarkable for its power of producing an offensive odour. Length 10 inches. This species has been confused with *C. reevesii* Richardson, and *C. curvicornis* Cuv. & Val., in other lists.

285b. C. CALAUROPOMUS. DRAGONET. *Id.* Richardson, Ichth. Erebus & Terror, 1844, p. 10, pl. 7, 4-5 (Pl. xxxii.).

Generally taken in nets in Port Jackson. Length 10 inches.

285c. C. PHASIS. *Id.* Gunther, Challenger Zool. i, 1880, p. 28, pl. 15, c. (Pl. xxxii.).

Restricted to deep water, and so far, known from but few specimens. Length 4 inches.

285d. C. PAPILIO. PAINTED DRAGONET. *Id.* Gunther, A.M.N.H. (3) xiv., 1864, p. 197.

A small and richly coloured species. *C. lateralis* Macleay, is merely the young of *C. papilio*. Length 5 inches.

(*C. lunatus* Schlegel, has been recorded from Port Jackson by Gunther, Challenger Zool. i., 1880, p. 28, but the identification was probably incorrect).

Suborder SCOMBROIDEA.

A. Jaws without canines.
B. Snout not produced into a pointed rostrum or sword.
C. Mouth with lateral cleft, and well developed teeth. *Scombriformes* (cxxxi.).
CC. Mouth small, anterior, with only feeble teeth. *Luvariformes* (cxxxii.).
BB. Snout forming a long pointed rostrum or sword. *Xiphiiformes* (cxxxiii.-iv.).
AA. Jaws with canines anteriorly. *Trichiuriformes* (cxxxv.-vi.).

SCOMBRIFORMES.

CXXXI. Family SCOMBRIDAE.

A. Caudal peduncle without a median keel on each side.
B. Scales minute; anterior dorsal spines highest. *Scomber* (286).
BB. Scales large; median dorsal spines highest. *Gasterochisma* (287).
AA. Caudal peduncle with a median keel on each side.
C. A single lateral line on each side.
D. Body largely naked except near the lateral line and corselet.
E. Interdorsal space wide, equal to half the head-length. *Auxis* (288).
EE. Interdorsal space narrow, less than one-fourth the head-length. *Euthynnus* (289).
DD. Body wholly covered with small scales.
F. Teeth subconical, little compressed; corselet distinct.
G. Vomer and palatines with villiform teeth. *Thunnus* (290).
GG. Vomer toothless, palatines with a row of conical teeth. *Sarda* (291).
FF. Teeth compressed; corselet obscure. *Scomberomorus* (292).
CC. Two lateral lines on each side. *Grammatorycnus* (293).

286. SCOMBER Linne, Syst. Nat. 10th. Ed. 1758, p. 297 (*scombrus*).

286a. S. AUSTRALASICUS. MACKEREL. *Id.* Cuvier & Valenciennes, Hist. Nat. Poiss. viii., 1831, p. 49. *S. colias* Stead, Ed. Fish. N.S. Wales, 1908, p. 94, pl. 63 (Pl. xxxiii.).

Abundant, and periodically moving along the coast in large shoals. Length 14 inches.

287. GASTEROCHISMA Richardson, A.M.N.H., xv., 1845, p. 346 (*melampus*).

287a. G. MELAMPUS. *Id.* Richardson, *Ibid.*, and Ichth. Erebus & Terror, 1846, p. 60, pl. 37, 1-3 (Pl. xxxiii.).

A very rare oceanic species, altering considerably in appearance with growth. Length over 5 feet.

288. AUXIS Cuvier, R. Anim. 2nd ed., ii., 1829, p. 199 (*rochei*).

A. 8 dorsal and 7 anal finlets. *thazard* (288a).
AA. 6 dorsal and 6 anal finlets. *ramsayi* (288b).

288a. A. THAZARD. FRIGATE MACKEREL. *Scomber thazard* Lacepede, H.N., Poiss. iii., 1802, p. 9. *A. vulgaris* Cuvier & Valenciennes, H.N. Poiss., viii., 1831, p. 139, pl. 216 (Pl. xxxiii.).

A widely distributed oceanic fish which occasionally appears in small shoals in Port Jackson. Length 15 inches.

288b. A. RAMSAYI. *Id.* Castelnau, P.L.S. N.S.W., iii., 1879, p. 382.

As no specimens having the characters ascribed to this species have been secured since it was first described, it is probable that the description is incorrect. *A. ramsayi* is probably synonymous with *A. thazard*.

289. EUTHYNNUS Jordan & Gilbert, Bull. U.S. Nat. Mus., xvi., 1882, p. 429 (*thunnina*).

A. Lateral line curved below second dorsal; 4 longitudinal stripes on lower half of body. *pelamis* (289a).

AA. Lateral line not so curved; no stripes on lower half of body. *alletterata* (289b).

289a. E. PELAMIS. BONITO. *Scomber pelamis* Linne, Syst. Nat. 10th. ed., 1758, p. 297. *Thynnus pelamis* Schlegel, Faun. Japon. Pisc., 1839, p. 96, pl. 49 (Pl. xxxiii.).

An oceanic species of which the only record from New South Wales waters is unsatisfactory. Length 3 feet.

289b. E. ALLETTERATA. LITTLE TUNNY. *Scomber alletteratus* Rafinesque, Caratteri, 1810, p. 46. *Gymnosarda alletterata* Jordan & Evermann, Bull. U.S. Nat. Mus., No. 47-1, 1896, p. 869, pl. 134, 366.

Occurs periodically in schools off the coast, and is occasionally captured by rod fishermen. Length 30 inches.

290. THUNNUS South, Encycl. Metropol. v., 1845, p. 620 (*thynnus*).

A. Pectoral fin much shorter than the head. *maccoyii* (290a).

AA. Pectoral fin as long as head. *germo* (290b).

290a. T. MACCOYII. SOUTHERN TUNNY. *Thynnus maccoyii* Castlenau, P. Zool. Soc. Vict., i., 1872, p. 104. *Thynnus thynnus* McCoy, Prodr. Zool. Soc. Vict., dec. v., 1880, pl. 44, 2 (Pl. xxxiii.).

This species is possibly identical with the Tunny of the Mediterranean and Atlantic. Length 7 feet.

290b. T. GERMO. ALBACORE. *Scomber germo* Lacepede, H.N. Poiss. iii., 1802, p. 1. *Thynnus sibi* Schlegel, Faun. Japon. Pisc., 1844, p. 97, pl. 50.

Though but once recognised from the New South Wales coast, this species is probably a regular visitor to our waters. Length 4 feet.

291. SARDA Cuvier, R. Anim. 2nd. ed., ii., 1829, p. 199 (*sarda*).

291a. S. CHILIENSIS. HORSE MACKEREL. *Pelamys chiliensis* Cuv. & Val., H.N. Poiss. viii., 1831, p. 163; *Id.* Day, Fish. India, 1876, p. 253, pl. 56, 1 (Pl. xxxiii.)

Appears at intervals in shoals on the coast. Length about 3 feet.

292. SCOMBEROMORUS Lacepede, H.N. Poiss. iii., 1802, p. 292 (*plumieri*).

A. Sides with bluish subvertical bars. *commersonii* (292a).

AA. Side with dark ovate or circular spots. *guttatus* (292b).

292a. S. COMMERSONII. BARRED SPANISH MACKEREL. *Scomber commersonii* Shaw, Gen. Zool. iv., 1803, p. 589, pl. 85, after *S. commerson* Lacepede, H.N. Poiss., ii., 1800, p. 600, pl. 20, 1. *Cybium commersonii* Day, Fish. India, 1876, p. 255, pl. 56, 5 (Pl. xxxiii.).

A fine fish captured by rod fishermen on the coast. Length 4½ feet.

292b. S. GUTTATUS. SPOTTED SPANISH MACKEREL. *Scomber guttatus* Bloch & Schneider, Syst. Ichth., 1801, p. 23, pl. 5. *Cybium guttatum* Day, Fish. India, 1876, p. 255, pl. 56, 4.

Occurs in shoals, and is captured on the coast like the preceding species. Length 6 feet.

293. GRAMMATORYCNUS Gill. P. Acad. N. Sci. Philad., 1862, p. 125 (*bilineatus*).

293a. G. BICARINATUS. LARGE-SCALED TUNNY. *Thynnus bicarinatus* Quoy & Gaimard, Voy. Uranie, 1825, p. 357, pl. 61, 1. *G. bicarinatus* McCulloch, P.L.S. N.S.W., xl., 1915, p. 266, pl. 35, 1 (Pl. xxxiii.).

A little known species which probably appears at intervals on the coast of New South Wales, but which has been but rarely captured. Length 3 feet.

LUVARIFORMES.

CXXXII. Family LUVARIDAE.

294. LUVARUS Rafinesque, Caratteri, 1810, p. 22 (*imperialis*).

294a. L. IMPERIALIS. *Id.* Rafinesque, *Ibid.*; *Id.* Day, Fish. Gt. Brit. & Irel. i., 1880-84, p. 121, pl. 43 (Pl. xxxiii.).

A wide-world oceanic species, once recorded from N.S. Wales waters. Length 6 feet.

XIPHIIFORMES.

A. No ventral fins or teeth in adults; scales obsolete. Fam. *Xiphiidae* (cxxxiii.).
AA. Ventral fins and teeth present; scales present. Fam. *Istiophoridae* (cxxxiv.).

CXXXIII. Family XIPHIIDAE.

295. XIPHIAS Linne, Syst. Nat. 10th. ed., 1758, p. 248 (*gladius*).

295a. X. GLADIAS. SPEAR-FISH. *Id.* Linne, *Ibid.*; *Id.* Day, Fish. Gt. Brit. & Irel. i., 1880-84, p. 146, pl. 49, 1-2 (Pl. xxxiv.).

Occurring in all temperate and tropical oceans. Length 15 feet.

CXXXIV. Family ISTIOPHORIDAE.

A. Ventral rays 2 or 3; dorsal fin high and undivided. *Istiophorus* (296).
AA. A single ventral ray; dorsal low, divided in adults. *Tetrapturus* (297).

296. ISTIOPHORUS Lacepede, H.N. Poiss, iii., 1802, p. 374 (*gladifer*).

296a. I. GLADIUS. SAIL-FISH. *Scomber gladius* Broussonet, Mem. Acad. Sci., 1876, p. 454, pl. 10. *I. gladius* McCulloch, Rec. Aust. Mus., xiii., 4, 1921, p. 137, pl. 24, 1 (Pl. xxxiv.).

An oceanic wanderer in the tropics, sometimes ranging southward to N.S. Wales waters.

297. TETRAPTURUS Rafinesque, Caratteri, 1810, p. 54 (*belone*).

297a. T. INDICUS. SWORD-FISH. *Id.* Cuvier & Valenciennes, H.N. Poiss., viii., 1831, p. 286. *Histiophorus gladius* Ramsay (nec. Broussonet), P.L.S. N.S.W., v., 1881, p. 295, pl. 8 (Pl. xxxiv.).

Occurs along the coast and reaches a length of 14 feet.

TRICHIURIFORMES.

A. Ventral fins reduced to scale-like appendages or absent.
Fam. *Trichiuridae* (cxxxv.).
AA. Each ventral fin represented by a spine, with or without rays.
Fam. *Gempylidae* (cxxxvi.).

CXXXV. Family TRICHIURIDAE.

A. Caudal fin wanting, tail ending in a fine point. *Trichiurus* (298).
AA. Caudal fin present. *Lepidopus* (299).

298. TRICHIURUS Linne, Syst. Nat. 10th. ed., 1758, p. 246 (*lepturus*).

298a. T. COXII. HAIR-TAIL. *Id.* Ramsay & Ogilby, P.L.S. N.S.W. (2), ii., 1887, p. 562 (Pl. xxxiv., an allied species *T. lepturus*).

Occasionally appears plentifully in deeper inlets along the coast. Length 4 feet.

299. LEPIDOPUS Gouan, Hist. Pisc., 1770, p. 107 (*gouani*).

299a. L. CAUDATUS. FROST FISH. *Trichiurus caudatus* Euphrasen, Stockh. K. Vet. Akad. Nya Handl. ix., 1788, p. 52, pl. 9, 2. *L. caudatus* Day, Fish. Gt. Brit. & Irel. i., 1880-4, p. 156, pl. 51, 2 (Pl. xxxiv.).

Widely distributed in both hemispheres. A young example taken by the trawlers is the only specimen recorded from the State. Length 6 feet.

CXXXVI. Family GEMPYLLIDAE.

A. Lateral line double; two separate rays behind dorsal and anal fins. *Iordanidia* (300).
AA. Lateral line single; 5-7 finlets behind dorsal and anal fins. *Thyrsites* (301).

300. JORDANIDIA Snyder, P.U.S. Nat. Mus. xl., 1911, p. 527 (*raptoria*).

300a. J. SOLANDRI. KING BARRACOUTA. *Gempylus solandri* Cuv. & Val., H.N. Poiss. viii., 1831, p. 215. *Rexea furcifera* Waite, Rec. Cantb. Mus. i. 3, 1911, p. 236, pl. lii. (Pl. xxxiv.).

A southern species, recently captured in 150 fathoms east of Sydney by the State Trawlers. A valuable food-fish. Length 30 inches.

301. THYRSITES Cuvier, R. Anim. 2nd. ed., ii., 1829, p. 200 (*atun*).

301a. T. ATUN. BARRACOUTA. *Scomber atun* Euphrasen, Stockh. Vet. Akad. Nya Handl. xii., 1791, p. 315. *T. atun* McCulloch, Rec. Austr. Mus. xiii. 4, 1921, p. 139, pl. 24, 2 (Pl. xxxiv.).

Visits the coast periodically in large schools. Length 4 feet.

Suborders TEUTHIDOIDEA and SIGANOIDEA.

A. Anal fin with two 2 or 3 spines *(Teuthidoidea)*.
B. Teeth in a single row in each jaw. Fam. *Teuthididae* (cxxxvii.).
BB. Teeth in several rows, brush like. Fam. *Zanclidae* (cxxxviii.).
AA. Anal fin with 7 spines *(Siganoidea)*. Fam. *Siganidae* (cxxxix.).

CXXXVII. Family TEUTHIDAE (*vel* ACANTHURIDAE *Auct.*).

A. A single movable spine on each side of the caudal peduncle. *Teuthis* (302).
AA. Three or more tubercles on the caudal peduncle.
B. Three caudal tubercles. *Xesurus* (303).
BB. More than three caudal tubercles. *Prionurus* (304).

302. TEUTHIS Linne, Syst. Nat. 12th. ed., 1766, p. 507 (*hepatus*).

This genus has been commonly called *Acanthurus* or *Hepatus*. It has no affinity with *Teuthis* of most authors, which now must be known as *Siganus*.

A. Body light, with dark cross bands. *triostegus* (300a).
AA. Body dark, with narrow wavy lines. *grammoptilus* (300b).

302a. T. TRIOSTEGUS. BANDED SURGEON-FISH. *Chætodon triostegus* Linne, Syst. Nat. 10th. ed., 1758, p. 274. *Acanthurus triostegus* Day, Fish. India, 1876, p. 204, pl. 48, 2.

A tropical species, which wanders southwards into our waters. Length 6 inches.

302b. T. GRAMMOPTILUS. SURGEON-FISH. *Acanthurus grammoptilus* Richardson, A.M.N.H., xi., 1842, p. 176. *T. grammoptilus* McCulloch, Mem. Qld. Mus. vi., 1918, p. 92, pl. 28 (Pl. xli.).

Another tropical fish, rare on the New South Wales coast. Length 13 inches.

303. XESURUS Jordan & Evermann, Rept. U.S. Fish. Comm. 1895 (1896), p. 421 (*punctatus*).

303a. X. MACULATUS. *Prionurus maculatus* Ogilby, P. Zool. Soc. 1887, p. 395.

Occasionally captured by line on the coast. Length 17 inches.

304. PRIONURUS Lacepede, Ann. Mus. Hist. Nat. iv., 1804, p. 211 (*microlepidotus*).

304a. P. MICROLEPIDOTUS. *Id.* Lacepede, *Ibid.*. *Id.* Cuv. & Val., H.N. Poiss. x., 1835, p. 295, pl. 292 (Pl. xli.).

Lives among rocks and feeds upon sea-weeds. Length 18 inches.

CXXXVIII. Family ZANCLIDAE.

305. ZANCLUS Cuv. & Val., H.N. Poiss. vii., 1831, p. 102 (*cornutus*).

305a. Z. CANESCENS. MOORISH IDOL. *Chaetodon canescens* Linne, Syst. Nat. 10th. ed., 1758, p. 272. *Z. cornutus* Day, Fish. India, 1875, p. 111, pl. 28, 4 (Pl. xli.).

A tropical species which only rarely strays southward of Queensland. Length 7 inches.

Suborder SIGANOIDEA.

CXXXIX. Family SIGANIDAE.

306. SIGANUS Forskal, Descr. Anim., 1775, pp. x, 25 (*rivulatus*).

A. Body with light spots above and stripes below. *javus* (306a).
AA. Body with irregular dark brown spots. *nebulosus* (306b).

306a. S. JAVUS. *Teuthis javus* Linne, Syst. Nat. 12th. ed., 1766, p. 507; *Id.* Day, Fish. India, 1875, p. 165, pl. 39, 5 (Pl. xli.).

A tropical species, occasionally ranging into New South Wales waters.

306b. S. NEBULOSUS. BLACK TREVALLY. *Amphacanthus nebulosus* Quoy & Gaimard, Voy. Uranie, 1825, p. 369. *Siganus nebulosus* Stead, Ed. Fish. N.S. Wales, 1908, p. 81, pl. 49.

Occasionally plentiful in Port Jackson, and more plentiful northwards. Length 10 inches.

(*S. sutor* Cuv. & Val., has been included in a list of New South Wales fishes by Waite, Mem. N.S. Wales Nat. Club, ii., 1904, p. 36, and Kner, Novara Zool., i., 1865, p. 207, has recorded *S. hexagonta* Bleeker, from Sydney. It is unlikely that either species occurs within the waters of this State).

Suborder GOBIOIDEA.

CXL. Family GOBIIDAE.

A. Ventral fins more or less united, with an anterior membrane connecting their spines. Subfam. *Gobiinae* (307-312).

AA. Ventral fins separate, no anterior membrane between their spines. Subfam. *Electrinae* (313-317).

Subfamily GOBIINAE.

A. Soft dorsal and anal short, free from the caudal.
  B. Head with prominent raised papillose ridges. *Callogobius* (311).
  BB. Head with only microscopic papillae in rows.
    C. Upper pectoral rays forming free filaments. *Bathygobius* (308).
    CC. Upper pectoral rays normal, not free.
      D. Scales larger, 50 or less in a longitudinal row.
        E. Operculum naked. *Gobius* (309).
        EE. Operculum scaly.
          F. 30 or less scales between operculum and tail. *Gobius australis* (309a).
          FF. 31-47 scales between operculum and tail. *Mugilogobius* (307).
      DD. Scales smaller, about 90 in a longitudinal row. *Cryptocentrus* (310).

AA. Soft dorsal and anal long, partly united with the caudal; D.VI./38-48. *Leme* (312).

307. MUGILOGOBIUS Smitt, Ofv. Vet. Akad. Forh., 1899, p. 543 (*abei*).

307a. M. DEVISI. *Id.* McCulloch & Ogilby, Rec. Austr. Mus. xii., 10, 1919, p. 223, pl. 36, 2.

Specimens in the Australian Museum were collected near Trial Bay by Mr. J. R. Kinghorn, Jan. 1920. Length nearly 2 inches.

308. BATHYGOBIUS Bleeker, Arch. Neerl. Sci. Nat., xiii., 1878, p. 54 (*nebulopunctatus*).

308a. B. KREFFTII. *Gobius krefftii* Steindachner, Sitzb. Akad. Wiss. Wien. liii. i., 1866, p. 451. *Mapo krefftii* McCulloch & Ogilby, Rec. Austr. Mus. xii. 10, 1919, p. 234, pl. 33, 4 (Pl. xxxv.).

Abundant in inlets along the coast. Length about 3 inches.

The specimen recorded by Gunther, Challenger Zool. i., 1880, p. 28, as *G. clbopunctatus* Cuv. & Val., from Port Jackson, is evidently referable to *B. krefftii*.

309. GOBIUS Linne, Syst. Nat. 10th. ed., 1758, p. 262 (*niger*).

None of the following species are referable to *Gobius* in its restricted sense, but are retained within the genus until their true generic positions can be determined.

A. Operculum scaly; head much compressed in adults. *australis* (309a).
AA. Operculum naked; head not compressed.
  B. Nape and greater portion of neck naked.
    C. Breast and base of pectoral naked. *lidwilli* (309b).
    CC. Breast and base of pectoral scaly.
      D. Upper surface of head without spots; dorsal fins longitudinally banded. *bifrenatus* (309c).
      DD. Upper surface of head with dark spots; dorsal fin with oblique rows of grey spots. *semifrenatus* (309d).
      DDD. G. frenatus apparently comes near here. *frenatus* (309e).
  BB. Nape and neck scaly. *lateralis*, var. *obliqus* (309f).

309a. G. AUSTRALIS. *Gillichthys australis* Ogilby, P.L.S. N.S.W. (2) ix., 1894, p. 367. *Gobius australis* McCulloch, Rec. Austr. Mus. xi. 7, 1917, p. 187, pl. 31, 3 (Pl. xxxv.).

A minute species, 2 inches long, of which adult males are remarkably compressed and have huge mouths extending far backward.

309b. G. LIDWILLI. *Id.* McCulloch, Rec. Austr. Mus. xi. 7, 1917, p. 185, pl. 31, 2 (Pl. xxxv.).

One of the smallest of vertebrate animals, adults being little more than half an inch in length.

309c. G. BIFRENATUS. BRIDLED GOBY. *Id.* Kner, Novara Zool. i., Fische, 1865, p. 177, pl. 7, 3.

Plentiful on muddy ground and among sea-grass, where it is taken in prawn-nets. Length 6 inches.

309d. G. SEMIFRENATUS. *Id.* Macleay, P.L.S. N.S.W., v., 1881, p. 598; *Id.* McCulloch & Ogilby, Rec. Austr. Mus. xii. 10, 1919, p. 214, pl. 34, 2 (Pl. xxxv.).

Commonly associated with, and very similar to the preceding species.

309e. G. FRENATUS. *Id.* Gunther, Brit. Mus. Cat. Fish. iii., 1861, p. 39; *Id.* Kner, Novara Zool. i., Fische, 1865, p. 174.

Apparently similar to the preceding species. Length 4 inches.

309f. G. LATERALIS, var. OBLIQUUS. *Id.* McCulloch & Ogilby, Rec. Austr. Mus. xii. 10, 1919, p. 249, pl. 34, 4.

Common in shallow water in inlets along the coast. Length about 2½ inches.

310. CRYPTOCENTRUS Cuv. & Val., Hist. Nat. Poiss. xii., 1837, p. 111 (*cryptocentrus*).

310a. C. GOBIOIDES. CRESTED GOBY. *Gobius gobioides* Ogilby, Cat. Fish. N.S. Wales, 1886, p. 35. *C. gobioides* McCulloch & Ogilby, Rec. Austr. Mus. xii. 10, 1919, p. 255, pl. 36, 1 (Pl. xxxv.).

Not uncommon on muddy grounds, and remarkable for its bright colouration. Length about 4 inches.

311. CALLOGOBIUS Blecker, Arch. Neerl. Sci. Nat. ix., 1874, p. 318 (*hasseltii*).

311a. C. HASSELTII, var MUCOSUS. *Gobius mucosus* Gunther, P. Zool. Soc., 1871, p. 663, pl. 63, a. *C. hasseltii* var *mucosus* McCulloch & Ogilby, Rec. Austr. Mus., xii. 10, 1919, p. 217, pl. 32, 4 (Pl. xxxv.).

A southern species which is not uncommon along the coast. Length about 4 inches.

312. LEME De Vis, P.L.S. N.S.W. viii., 1883, p. 286 (*mordax*).

312a. L. PURPURASCENS. *Id.* De Vis, P.L.S. N.S.W., ix., 1884, p. 698; *Id.* McCulloch & Ogilby, Rec. Austr. Mus. xii. 10, 1919, p. 206, pl. 31, 3 (Pl. xxxv.).

An elongate fish with minute eyes, and scaleless body, which lives in estuaries of rivers. Length about 9 inches.

(Tenison Woods, Fish. & Fisher, N.S.W., 1882, p. 27, intimates the occurrence of *Periopthalmodon barbarus* Linne, which is almost certainly incorrect).

Subfamily ELEOTRINAE.

A. Top of head without bony crests.
  B. Cheeks and opercles naked. — *Philypnodon* (313).
  BB. Opercles scaly, cheeks more or less scaly.
    C. Interorbital space scaly. — *Mogurnda* (314).
    CC. Interorbital space naked.
      D. Scales smaller, 37-40. — *Gobiomorphus* (315).
      DD. Scales larger, 27-35. — *Carassiops* (316).
AA. Top of head with bony crests. — *Butis* (317).

313. PHILYPNODON Bleeker, Arch. Neerl. Sci. Nat. ix., 1874, p. 301 (*nudiceps*).

313a. P. GRANDICEPS. FLAT-HEADED GUDGEON. *Eleotris grandiceps* Krefft, P. Zool. Soc., 1864, p. 183. *P. grandiceps* Waite, Rec. Austr. Mus. v., 1904, p. 285, pl. 36, 2 (Pl. xxxv.).

Plentiful in streams and waterholes around Sydney. Length 3½ inches.

314. MOGURNDA Gill, P. Acad. N. Sci. Philad., 1863, p. 270 (*mogurnda*).

A. Dorsal with 11-13 rays, body spotted. *adspersus* (314a).
AA. Dorsal with 9 rays, body striped. *australis* (314b).

314a. MOGURNDA MOGURNDA ADSPERSUS. PURPLE-SPOTTED GUDGEON. *Eleotris adspersus* Castlenau, P.L.S. N.S.W. iii., 1878, p. 142. *Kreffitius adspersus* Waite, Rec. Austr. Mus. v., 1904, p. 282, pl. 35, 1 (Pl. xxxvi.).

Occurs in the western rivers of the State, and in a few of the northern coastal streams. Length 4½ inches.

(*Eleotris striata* Steindachner, Sitzb. Akad. Wiss. Wien liii., 1866, p. 452, from Port Jackson, is apparently near *M. m. adspersus*).

314b. M. AUSTRALIS. STRIPED GUDGEON. *Eleotris australis* Krefft, P. Zool. Soc., 1864, p. 183. *Kreffitius australis* Waite, Rec. Austr. Mus. v., 1904, p. 283, pl. 35, 2 (Pl. xxxvi.).

Occurs in the eastern rivers of the State. Length 7 inches.

315. GOBIOMORPHUS Gill, P. Ac. N. Sci. Philad. 1863, p. 270 (*gobioides*).

315a. G. COXII. GUDGEON. *Eleotris coxii* Krefft, P. Zool. Soc. 1864, p. 183. *Kreffitius coxii* Waite, Rec. Austr. Mus. v. 5, 1904, p. 283, pl. 36, 1 (Pl. xxxvi.).

Plentiful in the Nepean River system. Length 7 inches.

316. CARASSIOPS Ogilby, P.L.S. N.S.W. xxi., 1897, p. 732 (*compressus*).

A. Second dorsal with 9-10 rays. *compressus* (316a).
AA. Second dorsal with 11-14 rays. subg. *Austrogobio*.
B. Mediolateral scales without dark markings. *galii* (316b).
BB. Each mediolateral scale with a dark vertical bar. *klunzingeri* (316c).

316a. C. COMPRESSUS. CARP GUDGEON. *Eleotris compressus* Krefft, P. Zool. Soc., 1864, p. 184. *C. compressus* Waite, Rec. Austr. Mus. v., 1904, p. 280, pl. 34, 1 (Pl. xxxvi.).

A species which is very variable in both form and colouration. Restricted to the eastern rivers in New South Wales. Length 4 inches.

316b. C. GALII. FIRE-TAILED GUDGEON. *Id.* Ogilby, P.L.S. N.S.W. xxii. 4, 1898, p. 788. *Id.* Waite, Rec. Austr. Mus. v., 1904, p. 281, pl. 34, 2 (Pl. xxxvi.).

Common in southern Queensland, and introduced into the Botanic Gardens, Sydney. Length about 2 inches.

316c. C. KLUNZINGERI. WESTERN CARP GUDGEON. *Id.* Ogilby, P.L.S. N.S.W. xxii., 1898, p. 787. *Id.* McCulloch & Ogilby, Rec. Austr. Mus. xii. 10, 1919, p. 289, pl. 37, 2-3.

Occurs in all the western streams of the State, and remarkable for the difference in appearance of the two sexes. Length 2½ inches.

317. BUTIS Bleeker, Nat. Tijd. Ned. Ind. xi., 1856, p. 412 (*butis*).

317a. B. AMBOINENSIS. *Eleotris amboinensis* Bleeker, Nat. Tijd. Ned. Ind. v., 1853, p. 343. *B. amboinensis* McCulloch & Ogilby, Rec. Austr. Mus. xii. 10, 1919, p. 271, pl. 36, 4 (Fl. xxxvi.).

A northern species, recorded from the Tweed River estuary. Length 6 inches.

Suborder BLENNIOIDEA.

CXLI. Family BLENNIIDAE.

A. One or two dorsal fins.
- B. Teeth slender and flattened, forming a comb-like row in each jaw; lateral canines present.
  - C. Gill-openings wide, separated by a narrow isthmus. *Blennius* (318).
  - CC. Gill-openings narrow, lateral.
    - D. Dorsal and anal fins not united with caudal; body shorter.
      - E. Gill-opening entirely above base of pectoral. *Petroscirtes* (319).
      - EE. Gill-opening partly in front of base of pectoral. *Aspidontus* (320).
    - DD. Dorsal and anal fins united with caudal; body elongate. *Xiphasia* (321).
- BB. Jaws without either rows of comb-like teeth or large lateral canines.
  - F. Three anterior dorsal spines forming a separate fin above the head.
    - G. First dorsal spine over or in advance of eye. *Cristiceps* (322).
    - GG. First dorsal spine behind vertical of eye. *Petraites* (323).
  - FF. A single dorsal fin, almost or entirely composed of spines.
    - H. Vomer with teeth. *Opniclinus* (324).
    - HH. Palate toothless. *Stichaeus* (325).

AA. Three dorsal fins.
- I. Lateral line interrupted.
  - J. Head scaly. *Gillias* (326).
  - JJ. Head naked. *Tripterygion* (327).
- II. Lateral line complete. *Lepidoblennius* (328).

318. BLENNIUS Linne, Syst. Nat. 10th ed., 1758, p. 256 (*ocellaris*).

318a. B. TASMANIANUS. *Id.* Richardson, P. Zool. Soc., 1839, p. 99. *Id.* Waite, Rec. Austr. Mus. vi., 1906, p. 205, pl. 36, 5 (Pl. xxxvi.).

A southern species, which extends northward along the N.S. Wales Coast. Length 5 inches.

319. PETROSCIRTES Ruppell, Fische Roth. Meer, 1828, p. 110 (*mitratus*).

A. Teeth forming a nearly straight row across the front of each jaw. *variabilis* (319a).

AA. Teeth forming a curved row around each jaw.
- B. A crest usually present above the head; body much compressed. *anolius* (319b).
- BB. No crest above the head; body thicker. *rotundiceps* (319c).

319a. P. VARIABILIS. SABRE-TOOTHED BLENNY. *Id.* Cantor, Cat. Malay. Fish., 1850, p. 200; *Id.* Day, Fish. India, 1876, p. 327, pl. 69, 7.

A widely distributed species. Length 5 inches.

319b. P. ANOLIUS. OYSTER BLENNY. *Blennechis anolius* Cuv. & Val., H.N. Poiss. xi., 1836, p. 288. *P. anolius* McCulloch, Austr. Zool. i. 4, 1917, p. 90, pl. 10, 2 (Pl. xxxvii.).

A remarkable little fish which lives in the empty shells of oysters where it deposits its eggs and guards them until they are hatched. Length 3 inches.

319c. P. ROTUNDICEPS. *Id.* Macleay, P.L.S. N.S.W. vi., 1881, p. 9.
A brightly coloured species, with fine blue lines on the sides. Length 3½ inches.

(*P. solorensis* Bleeker, has been incorrectly recorded from Sydney by Kner, Novara Zool. i., Fische, 1865, p. 196).

320. ASPIDONTUS Quoy & Gaimard, Voy. Astrolabe iii., 1834, p. 719 (*taeniatus*).

320a. A. MAROUBRAE. *Macrurrhynchus maroubrae* Ogilby, P.L.S. N.S.W. xxi., 1896, p. 137. *A. maroubrae* McCulloch, Austr. Zool. i. 4, 1917, p. 92, pl. 10, 1 (Pl. xxxvii.).
A rare species only 2 inches long.

321. XIPHASIA Swainson, Nat. Hist. Fish. Amph. Rept. ii., 1839, p. 259 (*setifer*).

321a. X. SETIFER. HAIR-TAILED BLENNY. *Id.* Swainson, *Ibid.*; *Id.* Day, Fish. India, 1876, p. 337, pl. 73, 1 (Pl. xxxvii.).
A pelagic fish, which occasionally strays southward to Port Jackson. Length 20 inches.

322. CRISTICEPS Cuvier & Valenciennes, H.N. Poiss. xi., 1836, p. 402 (*australis*).

A. Anterior spine just before front margin of eye. *aurantiacus* (322a).
AA. Anterior spine over front half of eye. *argyropleura* (322b).
AAA. Anterior spine over hinder portion of eye. *australis* (322c).

322a. C. AURANTIACUS. CRESTED WEED-FISH. *Id.* Castlenau, P.L.S. N.S.W. iii., 1879, p. 386. *Id.* McCulloch, Rec. Austr. Mus. vii. 1, 1908, p. 38, pl. 10, 1 (Pl. xxxvii.).
Common among weeds in estuaries. Length 10 inches.

322b. C. ARGYROPLEURA. *Id.* Kner, Novara Zool. I, Fische I, 1865, p. 199, pl. 7, 4.
Similar to, but not so common as the preceding species.

322c. C. AUSTRALIS. *Id.* Cuv. & Val., H.N. Poiss. xi., 1836, p. 402, pl. 336. Very common among weeds. Length 9 inches.

323. PETRAITES Ogilby, P.L.S. N.S.W. x., 1885, p. 226 (*heptaeolus*).

A. Body deep, its depth more than a fifth of the total length.
B. 35 equidistant dorsal rays. *roseus* (323a).
BB. 3 dorsal rays, an interspace between the 1st and 2nd. *heptaeolus* (213b).
AA. Body narrower, its depth less than a fifth of the total length. *fasciatus* (213c).

Cristiceps antiectes and *C. nasutus* are apparently near *P. fasciatus*.

323a. P. ROSEUS. *Cristiceps roseus* Gunther, Brit. Mus. Cat. Fish., iii., 1861, p. 274. *P. roseus* McCulloch, Rec. Austr. Mus. vii. 1, 1908, p. 40, pl. 10, 4 (Pl. xxxvii.).
Fairly common among weeds in rock-pools along the coast. Length 5 inches.

323b. P. HEPTAEOLUS. *Id.* Ogilby, P.L.S. N.S.W. x., 1885, p. 226; *Id.* McCulloch, Rec. Austr. Mus., vii. 1, 1908, p. 41, pl. 11, 1.
Similar to and occurring with the preceding species.

323c. P. FASCIATUS. *Cristiceps fasciatus* Macleay, P.L.S. N.S.W., vi., 1881, p. 19. *P. fasciatus* McCulloch, Rec. Austr. Mus. vii. 1, 1908, p. 42, pl. 11, 2.

Extremely plentiful in rock-pools on the coast. Length 2½ inches.

323d. P. ANTINECTES. *Cristiceps antinectes* Gunther, Brit. Mus. Cat. Fish. iii., 1861, p. 273-footnote.

A species which has been only imperfectly characterised, and is but little known.

323e. P. NASUTUS. *Cristiceps nasutus* Gunther, Brit. Mus. Cat. Fish. iii., 1861, p. 273.

Another little known species, nearly 2 inches long, which has not been recognised since first described.

324. OPHICLINUS Castlenau, P. Zool. Soc. Viet. i., 1872, p. 246 (*antarcticus*).

324a. O. GRACILIS. *Ophioclinus gracilis* Waite, Rec. Austr. Mus. vi. 3, 1906, p. 207, pl. 36, 6 (Pl. xxxvii.).

Not uncommon in rock-pools on the coast. Length 2½ inches.

325. STICHARIUM Gunther, A.M.N.H. (3) xx., 1867, p. 63 (*dorsale*).

325a. S. DORSALE. *Id.* Gunther, *Ibid.*

An apparently rare species, supposed to have been obtained in Port Jackson, but which has not been collected since first described.

326. GILLIAS Evermann & Marsh, Rept. U.S. Fish. Comm. xxv., 1899, p. 357 (*jordani*).

326a. G. STRIATICEPS. *Tripterygium striaticeps* Ramsay & Ogilby, P.L.S. N.S.W. (2) iii., 1888, p. 419.

Occurs in rock-pools in Port Jackson. Length 1½ inches.

327. TRIPTERYGION Risso, Hist. Nat. Europ. Merid. iii., 1826, p. 241 (*nasus*).

327a. T. ANNULATUM. *Tripterygion annulatum* Ramsay & Ogilby, P.L.S. N.S.W. (2) ii., 1888, p. 1021.

Very plentiful in rock-pools, and varying from bright green to scarlet. Length about 2 inches.

328. LEPIDOBLENNIUS Steindachner, Sitzb. Akad. Wiss. Wien lv. i., 1867, p. 11 (*haplodactylus*).

328a. L. HAPLODACTYLUS. JUMPING JOEY. *Id.* Steindachner, *Ibid.*, p. 12, pl. 1, 2-3 (Pl. xxxvi.).

Abundant on the coast, where it is commonly observed out of water sunning itself on the wet rocks. It skips into the nearest pool when alarmed. Length 4 inches.

Suborder OPHIDIOIDEA.

A. Ventrals inserted near the chin below the glossohyal; dorsal and anal fins confluent with the caudal. Fam. *Ophidiidae* (cxlii.).

AA. Ventrals jugular, attached to the humeral arch; caudal fin free in N.S. Wales species. Fam. *Brotulidae* ,cxliii.).

CXLII. Family OPHIDIIDAE.

A. Mandible with an enlarged outer row of teeth, and an inner narrow band of smaller ones. *Genypterus* (329).

AA. Mandible with a narrow band of strong subequal teeth. *Otophidium* (330).

329. GENYPTERUS Phillipi, Arch. Naturg. xxiii. i, 1857, p. 268 (*nigricans*).

329a. G. BLACODES. ROCKLING. *Ophidium blacodes* Bloch & Schneider, Syst. Ichth., 1801, p. 484. *Genypterus australis* McCoy, Frodr. Zool. Vict. dec. iii., 1879, pl. 21, 1 (Pl. xxxvii-an allied species *G. microstomus*).

A southern species, occasionally captured on the N.S. Wales coast. Length 3 feet.

330. OTOPHIDIUM Jordan, Rept. U.S. Fish. Comm., 1885 (1887), p. 126 (*omostigma*).

330a. O. GENYOPUS. *Id.* Ogilby, P.L.S. N.S.W. xxii., 1897, p. 93.

Known from a single shrivelled specimen, 3 inches long, which is possibly the young of the preceding species.

CXLIII. Family BROTULIDAE.

A. Scales imperfect, approximate posteriorly, spaced anteriorly. *Dermatopsis* (331).

AA. Scales well formed and imbricate. *Monothrix* (332).

331. DERMATOPSIS Ogilby, P.L.S. N.S.W. xxi., 1896, p. 138 (*macrodon*).

331a. D. MACRODON. *Id.* Ogilby, *Ibid.*, p. 140.

A translucent, flesh-coloured fish, which lives in rock-pools on the coast. Length 3 inches.

332. MONOTHRIX Ogilby, P.L.S. N.S.W. xxii., 1897, p. 87 (*polylepis*).

332a. M. POLYLEPIS. *Id.* Ogilby, *Ibid.*, p. 88.

Known from a single specimen which is little more than two inches long.

SUCKER-FISHES. Order DISCOCEPHALI.

Elongate fishes with tough leathery skin, and long laminated suctorial discs upon the upper surface of their heads. These discs enable them to cling to sharks, large fishes, and boats, by which they are carried about without effort to themselves.

CXLIV. Family ECHENEIDIDAE.

A. Inner ventral rays united by membrane, free from the abdomen. *Echeneis* (333).

AA. Inner ventral rays attached to abdomen by membrane. *Remore* (334).

333. ECHENEIS Linne, Syst. Nat. 10th ed., 1758, p. 260 (*naucrates*).

333a. E. NAUCRATES. SLENDER SUCKER-FISH. *Id.* Linne, Syst. Nat. 10th ed., 1758, p. 261; *Id.* Day, Fish. India, 1876, p. 257, pl. 57, 1 (Pl. xxxiv.).

A world-wide species, which is common on this coast. Length 3 feet.

334. REMORA Gill, P. Acad. N. Sci. Philad. 1862, p. 239 (*remora*).

334a. R. REMORA. SHORT SUCKER-FISH. *Echeneis remora* Linne, Syst. Nat. 10th ed., 1758, p. 260; *Id.* Day, Fish. Gt. Brit. & Irel. i., 1880-84, p. 108, pl. 39, 2 (Pl. xxxiv.).

Occurs in all temperate and tropical seas, but is less common on this coast than the preceding species. Length 12 inches.

Order SCLEROPAREI.

A large and diversified group, known as the Mailed-cheek Fishes, in which a posterior projection from the suborbital bones extends backward across the cheek to the preopercular. A scheme for the classification of the Order has been compiled by Regan (A.M.N.H. (8) xi., 1913, p. 169). The following provisional key is applicable to the species of New South Wales only.

A. Head not markedly depressed, deeper than broad.
  B. Head not completely encased in bony armature.
    C. Body partly or entirely scaly. Fam. *Scorpaenidae* (cxlv.).
    CC. Body naked.
      D. Ventral fins present. Fam. *Aploactidae* (cxlvi.).
      DD. No ventral fins. Fam. *Pataecidae* (cxlvii.).
  BB. Head completely encased in bony armour.
    E. Two anterior dorsal spines separate; pectoral reaching tail. Fam. *Cephalacanthidae* (cxlviii.).
    EE. No detached dorsal spines; pectorals not reaching tail. Fam. *Triglidae* (cxlix.).
AA. Head greatly depressed, much broader than deep.
  F. Body naked, with a row of spinate bucklers on each side. Fam. *Hoplichthyidae* (cl.).
  FF. Body scaly, without enlarged bucklers. Fam. *Platycephalidae* (cli.).

CXLV. Family SCORPAENIDAE.

A. Dorsal spines not greatly produced, largely united by membrane.
  B. Less than 15 dorsal spines.
    C. 12 dorsal spines.
      D. Bony stay of cheek with several spines; lower part of operculum naked. *Scorpaena* (335).
      DD. Bony stay of cheek nearly smooth; lower part of operculum scaly. *Helicolenus* (336).
    CC. 13 dorsal spines.
      E. Palatine teeth present. *Neosebastes* (337).
      EE. Palatines toothless. *Scorpaenodes* (338).
  BB. 15 or more dorsal spines.
    F. A broad and deep hollow on the nape behind the eyes. *Glyptauchen* (339).
    FF. No such hollow across the nape.
      G. Back scaly anteriorly, 15 dorsal spines. *Eotesthes* (340).
      GG. Back naked anteriorly, 16 dorsal spines. *Centropogon* (341).
AA. Dorsal spines long and slender, united by membrane only at their bases. *Pterois* (342).

335. SCORPAENA Linne, Syst. Nat. 10th ed., 1758, p. 266 (*porcus*).

A. 50-55 scales in a row below the lateral line. *cardinalis* (335a).
AA. 45 or less scales in a row below the lateral line. *cruenta* (335b).

335a. S. CARDINALIS. RED ROCKCOD. *Id.* Richardson, A.M.N.H. ix., 1842, p. 212. *S. jacksoniensis* Steindachner, Sitzb. Akad. Wiss. Wien liii., 1866, p. 438, pl. 3, 2-2a (Pl. xxxviii.).

A rock fish, plentiful in the markets, and reaching 18 inches in length.

335b. S. CRUENTA. *Id.* Richardson, A.M.N.H., ix., 1842, p. 217. *S. militaris* Richardson, Ichth. Erebus & Terror, 1845, p. 22, pl. 14, 1-2.

A southern species, apparently rare in this State.

(*S. bynoensis* Richardson, has been incorrectly recorded from Fort Jackson—*vide* McCulloch, Rec. W. Austr. Mus. i. 2, 1912, p. 96).

336. HELICOLENUS Goode & Bean, Oceanic Icth., 1895, p. 248 (*dactylopterus*).

336a. H. PERCOIDES. RED GURNET PERCH. *Sebastes percoides* Richardson, A.M.N.H. ix., 1842, p. 384, and Ichth. Erebus & Terror, 1845, p. 23, pl. 15, 1-2 (Pl. xxxviii.).

Common in deeper water, where it is captured by trawlers. Length 12 inches.

337. NEOSEBASTES Guichenot, Mem. Soc. Sci. Nat. Cherbourg xiii., 1868, p. 83 (*panda*).

A. More than 40 pores on lateral line. *scorpaenoides* (337a).
AA. Less than 40 pores on lateral line. *thetidis* (337b)

337a. N. SCORPAENOIDES. SPOTTED GURNET PERCH. *Id.* Guichenot, Mem. Soc. Sci. Nat. Cherbourg xiii., 1868, p. 85; *Id.* McCoy, Prodr. Zool. Viet. dec. xx., 1890, pl. 193 (Pl. xxxviii.).

A southern species, not common in this State. Length about 12 inches.

337b. N. THETIDIS. ROUGH GURNET PERCH. *Sebastes thetidis* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 100, pl. 20 (Pl. xxxviii.).

Common in deeper water, where it is taken by the trawlers. Length 13 inches.

338. SCORPAENODES Bleeker, Nat. Tijd. Nederl. Ind. xiii., 1857, p. 371 (*polylepis*).

338a. S. SCABER. PIGMY GURNET PERCH. *Sebastes scaber* Ramsay & Ogilby, P.L.S. N.S.W. x., 1886, p. 577. *Sebastopsis scaber* McCulloch, Rec. Austr. Mus. ix. 3, 1913, p. 387, pl. 13, 2.

A small species, which is not common, about 3 inches long.

339. GLYPTAUCHEN Gunther, Brit. Mus. Cat. Fish. ii., 1860, p. 121 (*panduratus*).

339a. G. PANDURATUS. GOBLIN-FISH. *Apistus panduratus* Richardson, P. Zool. Soc. 1850, p. 58, pl. 1, 3-4 (Pl. xxxviii.).

A rare species of grotesque appearance, which lives among rocks. Length 6 inches.

340. NOTESTHES Ogilby, P. Roy. Soc. Qld. xviii., 1903, p. 17 (*robustus*).

340a. N. ROBUSTA. BULLROUT. *Centropogon robustus* Gunther, Brit. Mus. Cat. Fish. ii., 1860, p. 128. *Centropogon troschelii* Steindachner, Sitzb. Akad. Wiss. Wien liii., 1866, p. 440, pl. 4, 1 (Pl. xxxviii.).

Common in estuaries, and ascends rivers. It inflicts a painful wound with its preorbital spines. Length 12 inches.

341. CENTROPOGON Gunther, Brit. Mus. Cat. Fish. ii., 1860, p. 128 (*australis*).

341a. C. AUSTRALIS. FORTESQUE. *Cottus australis* Shaw, White's Voy. N.S. Wales, 1790, p. 266, fig. 1; *Neosebastes australis* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 103, pl. 21 (Pl. xxxviii.).

Very plentiful at certain seasons in estuaries, and well known because of its power of stinging with its preorbital spines. Length 6 inches.

342. PTEROIS Oken, Isis, 1817, p. 1182 (*volitans*).

A. Pectoral rays simple, the membrane deeply cleft between the upper ones. *volitans* (342a).
AA. Some of the pectoral rays branched, the membrane not deeply cleft. *zebra* (342b).

342a. P. VOLITANS. RED FIRE-FISH. *Gasterosteus volitans* Linne, Syst. Nat. 10th ed., 1758, p. 296. *Pseudomonopterus volitans* Bleeker, Atlas Ichth. ix., 1878, p. 412, 3 (Pl. xxxviii.).

A widely distributed species in the tropics, which occasionally wanders southward along the north coast of this State. Length 12 inches.

342b. P. ZEBRA. FIRE-FISH. *Id.* Cuv. & Val., H.N. Poiss. iv., 1829, p. 367. *Pseudomonopterus zebra* Bleeker, Atlas Ichth. ix., 1878, pl. 411, 1.

Another occasional straggler from the tropics into our waters. Length 8 inches.

(*Gymnapistes marmoratus* Cuv. & Val., was incorrectly recorded from Port Jackson—vide McCulloch, Biol. Res. Endeavour, iii. 3, 1915, p. 161, pl. 36, 2. The record of *Synanceja horrida* Linne, from Port Jackson, is likewise incorrect —vide Ogilby, Cat. Fish. N.S. Wales, 1886, p. 22).

CXLVI. Family APLOACTIDAE.

343. APLOACTIS Schlegel, Faun. Japon. Pisc., 1843, p. 51 (*aspera*).

343a. A. MILESII. VELVET-FISH. *Id.* Richardson, P. Zool. Soc. 1850, p. 60, pl. 1, 1-2 (Pl. xl.).

A curious little fish which is not often captured. Length about 7 inches.

CXLVII. Family PATAECIDAE.

344. PATAECUS Richardson, A.M.N.H. xiv., 1844, p. 280 (*fronto*).

344a. P. FRONTO. RED-INDIAN FISH. FOREHEAD-FISH. *Id.* Richardson, *Ibid.*, and Ichth. Erebus & Terror, 1845, p. 20, pl. 13, 1-2 (Pl. xl.).

A remarkable species of grotesque form, and scarlet in colour. Length 9 inches.

(*P. maculatus* Gunther, has been wrongly recorded from Port Jackson—Ogilby, Cat. Fish. N.S. Wales, 1886, p. 39).

CXLVIII. Family CEPHALACANTHIDAE.

345. DACTYLOPTENA Jordan & Richardson, P.U.S. Nat. Mus. xxxiii., 1908, p. 665 (*orientalis*).

345a. D. ORIENTALIS. FLYING GURNARD. *Dactylopterus orientalis* Cuv. & Val., H.N. Poiss. iv., 1829, p. 134, pl. 76. *Cephalacanthus orientalis* Jordan & Evermann, Bull. U.S. Fish. Comm. xxiii. i., 1905, p. 473, fig. 208 (Pl. xxxix.).

A tropical fish which sometimes extends southward to this coast. Its enlarged pectoral fins enable it to fly short distances through the air. Length 12 inches.

CXLIX. Family TRIGLIDAE.

A. A row of spinigerous bucklers along bases of both dorsal fins.
  B. Scales larger, 50-60 on lateral line.
    C. Lateral line not armed with spinigerous plates. *Lepidotrigla* (346).
    CC. Lateral line armed with spinigerous plates. *Paratrigla* (347).
  BB. Scales smaller, 100 or more on lateral line. *Chelidonichthys* (348).
AA. Large bucklers along base of spinous dorsal only. *Pterygotrigla* (349).

346. LEPIDOTRIGLA Gunther, Brit. Mus. Cat. Fish. ii., 1860, p. 196 (*aspera*).

A. Interorbital space only slightly concave; profile convex before the eyes. *mulhalli* (346a).

AA. Interorbital space deeply concave; profile not convex before the eyes.

B. Pectoral fin shorter than the head. *modesta* (346b).

BB. Pectoral fin longer than the head. *argus* (346c).

346a. L. MULHALLI. *Id.* Macleay, P.L.S. N.S.W. viii., 1884, p. 460; *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 105, pl. 22.

Taken by trawlers in deeper water along the coast. Length 8 inches.

346b. L. MODESTA. *Id.* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 106, pl. 23 (Pl. xxxix.).

Occurs with the preceding species. Length 7½ inches.

346c. L. ARGUS. *Id.* Ogilby, New Fish. Qld. Coast, 1910, p. 123.

A Queensland species, which has been recorded from 27 fathoms off Cape Byron, New South Wales. Length 7 inches.

347. PARATRIGLA Ogilby, Ann. Qld. Mus. x., 1911, p. 56 (*pleuracanthica*).

347a. P. PAPILIO. BUTTERFLY GURNARD. *Trigla papilio* Cuvier & Valenciennes, H.N. Poiss. iv., 1829, p. 80, pl. 73. *T. pleuracanthica* Richardson, Ichth. Erebus & Terror, 1845, p. 23, pl. 16, 1-4 (Pl. xxxix.).

A small and ornate species, which is occasionally captured along the coast. It has been recorded by some authors under the name *papilio*, and by others as *pleuracanthica*, but I am unable to find any characters to distinguish these as separate species. Length about 7 inches.

348. CHELIDONICHTHYS Kaup, Arch. Naturg., 1873, p. 87 (*hirundo*).

348a. C. KUMU. RED GURNARD. *Trigla kumu* Lesson & Garnot, Voy. Coquille, 1826, p. 214, pl. 19 (Pl. xxxix.).

A widely distributed species which is common along the coast. Length 21 inches.

349. PTERYGOTRIGLA Waite, Mem. Austr. Mus. iv. 1, 1899, p. 108 (*polyommata*).

A. Interorbital space markedly concave; body plain. *polyommata* (348a).

AA. Interorbital space little concave; body with brown spots. *picta* (348b).

349a. P. POLYOMMATA. LATCHET. *Trigla polyommata* Richardson, P. Zool. Soc. 1839, p. 96, and Tr. Zool. Soc. iii., 1842, p. 87, pl. 5, 2 (Pl. xxxix.).

Abundant in deeper waters where it is captured by trawlers. Length 20 inches.

349b. P. PICTA. PAINTED GURNARD. *Trigla picta* Gunther, Challenger Zool. 1, 1880, p. 24, pl. 13, a; *Id.* Waite, Rec. Canterb. Mus. 1. 3, 1911, p. 252, pl. 55 (Pl. xxxix.).

A deep-water species, recently taken by trawlers east of Sydney in 150 fathoms. Length 14 inches.

CL. Family HOPLICHTHYIDAE.

350. HOPLICHTHYS Cuvier & Valenciennes, H.N. Poiss, iv., 1829, pp. xix., 264 (*langsdorfii*).

350a. H. HASWELLI. SPINY FLATHEAD. *Id.* McCulloch, Rec. Austr. Mus. vi. 5, 1907, p. 351, pl. 64 (Pl. xl.).

Abundant in deeper waters, and a good table fish notwithstanding its forbidding appearance. Length 17 inches.

CLI. Family PLATYCEPHALIDAE.

A. Head largely scaly; no enlarged, thickened scales on the lateral line.
B. Vomerine teeth forming a curved band across the bone; cranial ridges not serrated or spinose. *Platycephalus* (351).
BB. Vomerine teeth in two separate groups, cranial ridges armed with spines and serratures. *Insidiator* (352).
AA. Head almost naked; scales of lateral line enlarged and thickened. *Thysanophrys* (353).

351. PLATYCEPHALUS Bloch, Ausl. Fische ix., 1795, p. 96 (*spathula*).

A. Jaws and palate without canines. subg. *Platycephalus*.
B. Upper surface of cranium with some exposed bony ridges.
C. Teeth not uniform, some on premaxillary symphysis, vomer, and palatines more or less enlarged.
D. Interorbital space equal to or greater than transverse diameter of eye (except in young). Tail dusky with darker spots and white margins.
E. Interorbital space nearly flat; head dusky with brown spots. *fuscus* (351a).
EE. Interorbital space concave; head and body marbled. *marmoratus* (351b).
DD. Interorbital space narrower than transverse diameter of eye.
F. 13 dorsal rays; eye diameter equal to about half its distance from end of mandible; 3 or more black longitudinal stripes along tail from base to tip. *arenarius* (351c).
FF. 14 dorsal rays; eye diameter greater than half its distance from end of mandible; black markings confined to posterior half of tail. *caeruleopunctatus* (351d).
CC. Teeth small and uniform without larger ones on premaxillary symphysis, vomer, or palatines; lower preopercular spine very large. *longispinis* (351e).
BB. No exposed bony ridges on upper surface of cranium. *laevigatus* (351f).
AA. Jaws and palate with large canines. subg. *Neoplatycephalus*.
G. About 11 gill-rakers on first arch, which are slender. *macrodon* (351g).

351a. P. FUSCUS. DUSKY FLATHEAD. *Id.* Cuvier & Valenciennes, H.N. Poiss. iv., 1829, p. 241; *Id.* Quoy & Gaimard, Zool. Astrolabe iii., 1835, p. 681, pl. 10, 1 (Pl. xl.).

A choice table-fish, of which large numbers are captured in inlets along the whole coast-line. Length 40 inches.

351b. P. MARMORATUS. MARBLED FLATHEAD. *Id.* Stead, New Fish. N.S. Wales, 1908, p. 9, pl. 3-5; *Id.* McCulloch, Biol. Res. Endeavour iv. 4, 1916, p. 197, pl. 57, 1.

Occurs on the northern portion of the coast. Length about 20 inches.

351c. P. ARENARIUS. SAND FLATHEAD. *Id.* Ramsay & Ogilby, P.L.S. N.S.W. x., 1886, p. 577; *Id.* McCulloch, Biol. Res. Endeavour iii. 3, 1915, p. 164, pl. 13. 1 (Pl. xl.).

A northern species, readily distinguished by the black longitudinal stripes on its tail. Length about 12 inches.

351d. P. CAERULEOPUNCTATUS *nom. nov.* SAND FLATHEAD. *Platycephalus bassensis* Stead, Ed. Fish. N.S. Wales, 1908, p. 112, pl. 78 (not *P. bassensis* Cuvier & Valenciennes).

The common Sand Flathead of New South Wales has been incorrectly recorded by various authors as *P. bassensis*, but it differs from that species in its somewhat stronger dentition, and in the greater development of its cranial ridges. Its colour and marking also is different to that of *P. bassensis*. As the species is without a name, I use *caeruleopunctatus* for it, this being a suitable name under which it has been labelled in the Australian Museum.

351e. P. LONGISPINIS. LONG-SPINED FLATHEAD. *Id.* Macleay, P.L.S. N.S.W. ix., 1884, p. 170.

Captured by line fishermen on the coast. Length 12 inches.

351f. P. LAEVIGATUS. SMOOTH FLATHEAD. *Id.* Cuvier & Valenciennes, H.N. Poiss. iv., 1829, p. 248; *Id.* Quoy & Gaimard, Zool. Astrolabe iii., 1835, p. 684, pl. 10, 4.

A southern species, forwarded to Sydney from the south coast of the State.

Subgenus NEOPLATYCEPHALUS Castlenau, P. Zool. Soc. Vict. i., 1872, p. 87 (*grandis*).

351g. P. NEOPLATYCEPHALUS MACRODON. TIGER FLATHEAD. *Id.* Ogilby, P.L.S. N.S.W. x., 1885, p. 226.

A deeper water species, captured in abundance by trawlers. Length 14 inches.

352. INSIDIATOR Jordan & Snyder, P.U.S. Nat. Mus. xxiii., 1900, p. 368 (*rudis*).

A. Anterior third of lateral line with distinct upstanding spines. *jugosus* (352a).
AA. Only a few anterior scales of lateral line with spines.
B. Teeth of palate enlarged, cardiform. *diversidens* (352b).
BB. Teeth villiform. *nematophthalmus* (352c).

352a. I. JUGOSUS. *Id.* McCulloch, Biol. Res. Endeavour ii. 3, 1914, p. 144, pl. 30, 2 (Pl. xl.).

A northern species, which occasionally extends southward to Port Jackson. Length 8 inches.

352b. I. DIVERSIDENS. *Id.* McCulloch, Biol. Res. Endeavour, ii. 3, 1914, p. 148, pl. 31, 1.

Three specimens were trawled in 48 fathoms off Port Stephens. Length 11 inches.

352c. I. NEMATOPHTHALMUS. *Platycephalus nematophthalmus* Gunther, Brit. Mus. Cat. Fish. ii., 1860, p. 184, and Fische Sudsee v., 1876, p. 166, pl. 107, c.

A common species in Queensland. Two specimens are in the Australian Museum from Wallis Lake, New South Wales. Length 12 inches.

353. THYSANOPHRYS Ogilby, P.L.S. N.S.W. xxiii., 1898, p. 40 (*cirronasus*).

353a. T. CIRRONASUS. ROCK FLATHEAD. *Platycephalus cirronasus* Richardson, Ichth. Erebus & Terror, 1848, p. 114, pl. 51, 7-10 (Pl. xl.).

An ornate species, variegated with many tints to harmonise with the colours of the weed-covered rocks among which this species lives. Length 15 inches.

Order XENOPTERI.

Small fishes which cling to stones by means of an adhesive disc between and behind the ventral fins.

CLII. CLING-FISHES. Family GOBIESOCIDAE.

354. DIPLOCREPIS Gunther, Brit. Mus. Cat. Fish. iii., 1861, p. 506 (*puniceus*).

A. Bases of dorsal and anal fins longer than caudal peduncle; 7-10 dorsal and 6-8 anal rays. *costatus* (354a).
AA. Bases of dorsal and anal fins shorter than caudal peduncle; 5 dorsal and 5 anal rays. *parvipinnis* (354b).

354a. D. COSTATUS. CLING-FISH. *Id.* Ogilby, P.L.S. N.S.W. x., 1885, p. 270; *Id.* Waite, Rec. Austr. Mus. v., 1904, p. 179, pl. 34, 1 (Pl. xxxvii.).
Common in rock-pools, and of a pale flesh-colour. Length 2½ inches.

354b. D. PARVIPINNIS. LITTLE CLING-FISH. *Id.* Waite, Rec. Austr. Mus. vi. 3, 1906, p. 202, pl. 36, 3 (Pl. xxxvii.).
Attaches itself to weeds in rock-pools on the coast. Length 1 inch.

(*Crepidogaster tasmaniensis* Gunther, is recorded from Sydney by Kner, Novara Zool. i., 1867, p. 277, but as it has not been since obtained here, the record is regarded as incorrect).

Order PEDICULATI.

A. Gill-openings wide, vertical, in front of base of pectorals.
Suborder *Batrachoidea* (cliii.).
AA. Gill-openings smaller, above, behind, or below base of pectorals.
Suborder *Lophioidea* (cliv.-clvi.).

Suborder BATRACHOIDEA.

CLIII. Family BATRACHOIDIDAE.

355. PSEUDOBATRACHUS Castlenau, Res. Fish. Austr. (Viet. Offic. Rec. Philad. Exhib.), 1875, p. 24 (*striatus*).

355a. P. DUBIUS. FROG-FISH. *Lophius dubius* Shaw, White's Voy. N.S. Wales, 1790, p. 265, and figure. *P. dubius* McCulloch, Rec. W. Austr. Mus. i. 3, 1914, p. 224, fig. 1 (Pl. xli.).
Common in muddy places in estuaries. Length 12 inches.
The specimen recorded from Sydney by Kner, Novara Zool. i., 1865, p. 189, as *Batrachus trispinosus* is apparently referable to *P. dubius*.

Suborder LOPHIOIDEA.

A. Body not flattened, more or less compressed.
B. Spinous dorsal represented by three separate rays, the first being above the snout. Fam. *Antennariidae* (cliv.).
BB. Second and third rays of spinous dorsal united by membrane.
Fam. *Brachionichthyidae* (clv.).
AA. Body flattened forming a rounded disc. Fam. *Ogcocephalidae* (clvi.).

CLIV. ANGLER-FISHES.—Family ANTENNARIIDAE.

A. Skin naked. *Histrio* (356).
AA. Skin beset with bristles or spines. *Antennarius* (357).

356. HISTRIO Fischer, Zoog. Tab. Synop. Illustr. 3rd. ed., i., 1813, p. 70, 78 (*histrio*)—*vide* Jordan, Gen. Fish. i., 1917, p. 84. A name of uncertain status.

356a. H. HISTRIO. MARBLED ANGLER. *Lophius histrio* Linne, Syst. Nat. 10th. ed., 1758, p. 327. *Antennarius marmoratus* Gunther, Fische Südsee v., 1876, p. 162, pl. 100, a (Pl. xli.).
A widely distributed species in temperate and tropical seas, which lives among seaweeds. Length 5 inches.

357. ANTENNARIUS Cuvier, Reg. Anim. 1st ed., ii., 1817, p. 310 (*chironectes*).

A. Body marked with blackish stripes. *striatus* (357a).
AA. Body not striped.
B. Body and fins almost black. *commersonii* (357b).
BB. Body reddish with darker markings. *nummifer* (357c).

357a. A. STRIATUS. STRIPED ANGLER. *Lophius striatus* Shaw, Nat. Miscel. v., 1794, pl. 175. *A. striatus* Gunther, Fische Sudsee v., 1876, p. 162, pl. 99, b (Pl. xli.).

A. pinniceps Cuv. & Val. which occurs in New South Wales, appears to be merely a colour-variation of *A. striatus* in which the stripes and spots on the body and fins are not so well developed as in the typical form. Length 7 inches.

357b. A. COMMERSONII. BLACK ANGLER. *Chironectes commersonii* Cuvier, Mem. Mus. Hist. Nat. iii., 1817, p. 431. *A. commersonii* Bleeker, Atl. Ichth. v., 1865, p. 20, pl. 197, 3.

Occasionally captured on muddy ground where it lies in wait for the prey attracted by its flesh-coloured bait. Length 5 inches.

357c. A. NUMMIFER. SCARLET ANGLER. *Chironectes nummifer* Cuvier, Mem. Mus. Hist. Nat. iii., 1817, p. 430. *A. nummifer* Bleeker, Atlas Ichth. v., 1865, p. 18, pl. 198, 2.

A tropical species, occasionally extending southward to Port Jackson. Length 6 inches.

CLV. Family BRACHIONICHTHYIDAE.

358. BRACHIONICHTHYS Bleeker, Nat. Tijd. Ned. Ind. vii., 1854, p. 121 (*hirsutus*).

358a. B. HIRSUTUS. HAND-FISH. *Lophius hirsutus* Lacep., Ann. Mus. Hist. Nat. iv., 1804, pp. 202, 210, pl. 55, 3.

A southern species, which is only taken in deep water on the New South Wales coast. Length about 3 inches.

CLVI. Family OGCOCEPHALIDAE.

359. HALIEUTAEA Cuvier & Valenciennes, H.N. Poiss. xii., 1837, p. 455 (*stellata*).

359a. H. BREVICAUDA. *Id.* Ogilby, New Fish. Qld. Coast, 1911, p. 138; *Id.* McCulloch, Biol. Res. Endeavour ii. 3, 1914, p. 163, pl. xxxiii. (Pl. xli.).

Specimens are captured by trawlers in deep water. Length 6 inches.

Order PLECTOGNATHI.

A. Spinous dorsal represented by one or more spines above the head.
  B. Body covered with large bony plates. Fam. *Balistidae* (clvii.).
  BB. Body covered with minute scales which may be rough or velvety. Fam. *Monacanthidae* (clviii.).

AA. No anterior spinous dorsal.
  C. Body encased in an immovable carapace of hexagonal plates. Fam. *Ostraciidae* (clix.).
  CC. Body covered with spines or prickles, or naked.
    D. Caudal region normal, with a caudal peduncle.
      E. Each jaw divided by a median suture; body naked or with small prickles. Fam. *Tetraodontidae* (clx.).
      EE. Both jaws undivided by a median suture; body with strong spines. Fam. *Diodontidae* (clxi.).
    DD. Body subcircular, compressed, truncated behind dorsal and anal fins. Fam. *Molidae* (clxii.).

CLVII. Family BALISTIDAE.

360. BALISTES Linne, Syst. Nat. 10th. ed., 1758, p. 327 (*vetula*).

360a. B. JACKSONIANUS. *Id.* Quoy & Gaimard, Voy. Uranie, Zool., 1824, p. 209.

A tiny specimen, 1¼ inches long, was obtained in Port Jackson in 1824, but no other representative of the species has since been collected.

(*Balistes vidua* Richardson, was recorded from Port Jackson by Ogilby, Fish. N.S. Wales, 1886, p. 61, but the data accompanying his specimen was quite unreliable. *Balistes maculatus* Linne, has likewise been incorrectly recorded from Sydney by Kner, Novara Zool. i., 1867, p. 401).

CLVIII. Family MONACANTHIDAE.

A. Pubic bone ending in one or more spines.
  B. Pelvic spine movable.
    C. Body and dorsal spine without or with small cutaneous filaments. *Monacanthus* (361).
    CC. Body and dorsal spine with large cutaneous filaments. *Chaetodermis* (362).
  BB. Pelvic spine fixed. *Cantherines* (363).
AA. Pubic bone without a terminal spine.
  D. Dorsal and anal fin long, with 42-46 rays. *Osbeckia* (364).
  DD. Dorsal and anal fins with less than 30 rays. *Brachaluteres* (365).

361. MONACANTHUS Oken, Isis, 1817, p. 1181-3 (*chinensis*).

A. Ventral cutaneous expansion large, extending beyond the pelvic spine in adults. *chinensis* (361a).
AA. Ventral cutaneous expansion smaller, not extending beyond the pelvic spine.
  B. More than 30 anal rays.
    C. D. 29-33, A. 31-33. *sulcatus* (361b).
    CC. D. 35, A. 37. *filicauda* (361c).
  BB. Less than 30 anal rays.
    D. Each scale with 3-5 spinules directed backward. *tomentosus* (361d).
    DD. Each scale with a single upstanding spinule. *nitens* (361e).

361a. M. CHINENSIS. FAN-BELLIED LEATHER-JACKET. *Balistes chinensis* Osbeck, Reise Ost. Indien China, 1765, p. 147. *M. chinensis* Bleeker, Atlas Ichth. v., 1869, p. 125, pl. 222, 2 (Pl. xlii.).

Very common in Port Jackson, where it swims leisurely among weed-covered rocks in search of the small organisms upon which it feeds.

M. megalourus Richardson, has also been commonly recognised from New South Wales. This is said to differ from *chinensis* in having larger scales and a more slender dorsal spine, but it is probable that these are variable characters, and that the two species are synonymous. Length 10 inches.

361b. M. SULCATUS. *Id.* Hollard, Ann. Sci. Nat. (4) ii., 1854, p. 363, pl. 14, 3. *M. isogramma* Bleeker, Atlas Ichth. v., 1869, p. 128, pl. 222, 1.

This species was introduced into a New South Wales list by Ogilby, Cat. Fish. N.S.W., 1886, p. 63, upon unreliable authority.

361c. M. FILICAUDA. *Id.* Gunther, Challenger Zool. i., 1880, p. 50, pl. 23, d (Pl. xlii).

A northern species, rarely wandering southward to Sydney. Length 5 inches.

361d. M. TOMENTOSUS. *Balistes tomentosus* Linne, Syst. Nat. 10th. ed., 1758, p. 328. *Id.* Bleeker, Atlas Ichth. v., 1869, p. 127, pl. 220, 1.

Another tropical species of which the New South Wales records are very unreliable. Length 5 inches.

361e. M. NITENS. SILVER LEATHER-JACKET. *Id.* Hollard, Ann. Sci. Nat. (4) ii., 1854, p. 364, pl. 14, 4.

A diminutive species, less than 2 inches long, which is rarely stranded on our ocean beaches.

362. CHAETODERMIS Swainson, Nat. Hist. Fish. Amph. Rept. ii., 1839, p. 327 (*spinosissimus*).

362a. C. PENNICILLIGERUS. PRICKLY LEATHER-JACKET. *Monacanthus penicilligerus* Cuvier, Reg. Anim. 2nd. ed., ii., 1829, p. 374. *C. penicilligerus* Bleeker, Atlas Ichth. v., 1869, p. 129, pl. 221, 3 (Pl. xlii.).

Though occurring in Queensland, the records of this species from New South Wales need verification.

363. CANTHERINES Swainson, Nat. Hist. Fish. Amph. Rept. ii., 1839, p. 327 (*nasutus*).

A. Depth at origins of dorsal and anal fins less than half the length to the hypural joint.
  B. Pubic spine distinct; caudal peduncle shorter than the interdorsal space.
    C. Depth at origin of dorsal and anal fins less than length of head. *ayraudi* (363a).
    CC. Depth at origin of dorsal and anal fins greater than length of head.
      D. Less than 30 anal rays; scales very coarse. *granulatus* (363b).
      DD. More than 30 anal rays.
        E. Skin beset with minute equidistant spines.
          F. No brush of setae between dorsal and anal fins; D. 35-38, A. 33-36. *hippocrepis* (363c).
          FF. A brush of setae between dorsal and anal fins; D. 31-33, A. 31-32. *guntheri* (363d).
        EE. Skin beset with spines which are not equidistant but in groups of 2-5.
          G. Each scale with 3-5 strong spines, united at their bases; D. 36-39, A. 33-35. *trachylepis* (363e).
          GG. Each scale with 2-3 slender spines which are juxtaposed but not united; D. 33-35, A. 31-36. *setosus* (363f).
  BB. Pubic spine obsolete, length of caudal peduncle subequal to interdorsal space.
    H. A blue stripe from chin, through eye, to middle of side, and many blue spots. *spilomelanurus* (363g).
    HH. Greenish, with brown spots. *maculosus* (363h).
AA. Depth at origins of dorsal and anal fins half or more than half of length to hypural joint; pubic spine small or obsolete. *mosaicus* (363j).

Cantherines convexirostris, castlenaui, prasinus, freycineti, and *rudis* are omitted from the above key, because certain of their structural details, necessary for the determination of their affinities, are unknown to me.

363a. C. AYRAUDI. CHINAMAN LEATHER-JACKET. *Balistes ayraudi* Quoy & Gaimard, Voy. Uranie, Zool., 1824, p. 216, pl. 47, 2. *Pseudomonacanthus ayraudi* Roughley, Fish. Austr., 1916, p. 188, pl. 66.

The young are plentiful in inlets while adults are more commonly captured in deeper water. Length 20 inches.

363b. C. GRANULATUS. ROUGH LEATHER-JACKET. *Balistes granulatus* Shaw, White's Voy. N.S. Wales, 1790, p. 295 & figure. *Monacanthus granulatus* Richardson, Ichth. Erebus & Terror, 1846, p. 63, pl. 40, 1-2 (Pl. xlii.).

Common in inlets along the coast. Length 9 inches.

363c. C. HIPPOCREPIS. VARIABLE LEATHER-JACKET. *Balistes hippocrepis* Quoy & Gaimard, Voy. Uranie, Zool., 1824, p. 212. *Aleuterius variabilis* Richardson, Ichth. Erebus & Terror, 1846, p. 67, pl. 52, 1-7 (Pl. xlii.).

A common species, altering considerably in both form and colouration with growth. Length 18 inches.

C. freycineti Quoy & Gaimard, was originally described from Mauritius, but Hollard, Ann. Sci. Nat. (4) ii., 1854, p. 336, pl. 12, 3, later reported it from New South Wales. The species has not since been recognised from Australia, however, and it seems probable that his New South Wales examples were incorrectly identified as *C. freycineti*. He noted their similarity to *C. variabilis*.

363d. C. GUNTHERI. TOOTH-BRUSH LEATHER-JACKET. *Monacanthus guntheri* Macleay, P.L.S. N.S.W. vi., 1881, p. 314. *M. browni* McCoy, Prodr. Zool. Viet. dec. xiii., 1886, pl. 124 (Pl. xlii.—not *Aleuterius brownii* Richardson).

A southern species, characterised by the possession of a remarkable brush of long setae on each side. Length 10 inches.

363e. C TRACHYLEPIS YELLOW-FINNED LEATHER-JACKET. *Monacanthus trachylepis* Gunther, Brit. Mus. Cat. Fish. viii., 1870, p. 248 (Pl. xlii.).

Occurs in inlets, sometimes in schools. Length 16 inches.

The specimen recorded by Castlenau from Port Jackson as *Monacanthus rudis*, P.L.S. N.S.W. iii., 1879, p. 399, had 38 dorsal rays and other characters of *C. trachylepis*, and was probably referable to this species. As no other authors have recognised *C. rudis* from New South Wales, it seems probable that the species does not occur here.

363f. C. SETOSUS. VELVET LEATHER-JACKET. *Monacanthus setosus* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 91, pl. 16. *C. setosus* Waite & McCulloch, Tr. Roy. Soc. S. Austr. xxxix., 1915, p. 472, pl. 14.

Common in deep water along the coast, and frequently taken by trawlers. Length 11 inches.

363g. C. SPILOMELANURUS. *Balistes spilomelanurus* Quoy & Gaimard, Voy. Uranie, Zool., 1824, p. 217. *Aleuterius paragaudatus* Richardson, Ichth. Erebus & Terror, 1846, p. 66, pl. 39, 1-4 (Pl. xlii.).

Common around wharf-piles and on weedy flats in Port Jackson. Length 5 inches.

363h. C. MACULOSUS. *Aleuterius maculosus* Richardson, Ichth. Erebus & Terror, 1846, p. 67, pl. 39, 5-7.

Found commonly with the preceding species, of which it is probably merely a sexual form. Length 5 inches.

363i. C. PRASINUS. *Monacanthus prasinus* Castlenau, P. Zool. Soc. Viet. i., 1872, p. 205.

This species, described from a specimen under 3 inches long, has not been recognised by anybody but Castlenau.

363j. C. MOSAICUS. MOSAIC LEATHER-JACKET. *Monacanthus mosaicus* Ramsay & Ogilby, P.L.S. N.S.W. (2) i., 1886, p. 5. *C. mosaicus* McCulloch, Biol. Res. Endeavour iii. 3, 1915, p. 170, pl. 37, 1-2.

A deep and smooth skinned species, ornamented with mosaic-like colour-marking. Length 16 inches.

363k. C. CASTLENAUI. *Monacanthus peronii* Castlenau P.L.S. N.S.W. iii., 1879, p. 398 (not *M. peronii* Hollard). *M. castlenaui* Macleay, P.L.S. N.S.W. vi., 1881, p. 316—substitute name.

The few characters given in Castlenau's paper are insufficient for the recognition of this species. It is doubtless synonymous with one of the preceding species.

(*C. platifrons* Hollard, has been incorrectly included in New South Wales lists on the authority of Gunther, Brit. Mus. Cat. Fish. viii., 1870, p. 229, who erroneously gave New South Wales as the locality of the holotype instead of King George's Sound.

C. convexirostris Gunther was included without comment in a mere list of New South Wales fishes by Castlenau, but it has not since been recognised from these waters).

364. OSBECKIA Jordan & Evermann, Rept. U.S. Fish. Comm. 1895 (1896), p. 424 (*scripta*).

364a. O. MACULICAUDA. *Monacanthus maculicauda* Ogilby, Cat. Fish. N.S. Wales, 1886, p. 64.

A very rare species. Length 7 inches.

365. BRACHALUTERES Bleeker, Nat. Tijd. Dierk. iii., 1866, p. 13 (*trossulus*).

365a. B. TROSSULUS. PIGMY LEATHER-JACKET. *Aleuterius trossulus* Richardson, Ichth. Erebus & Terror, 1846, p. 68, pl. 40, 5-6, (Pl. xlii.).

Very common on weedy flats and around wharf-piles and jetties. Length 3½ inches.

CLIX. Family OSTRACIIDAE.

A. Carapace closed behind the anal fin.
  B. Carapace with four or five angles. *Ostracion* (366).
  BB. Carapace with three angles. *Lactophrys* (367).
AA. Carapace not closed behind the anal fin. *Anoplocapros* (368).

366. OSTRACION Linne, Syst. Nat. 10th ed., 1758, p. 330 (*cubicus*).

A. Large spines on middle of back and supralateral ridges; supraorbital spines shorter than eye; caudal rays with several branches. *diaphanum* (366a).
AA. Median dorsal and supralateral spines small or wanting; supraorbital spines longer than eye; caudal rays mostly bifurcate. *cornutus* (366b).

366a. O. DIAPHANUS. BOX-FISH. *Ostracion diaphanus* Bloch & Schneider, Syst. Ichth., 1801, p. 501. *O. cornutus* Bleeker, Atlas Ichth. v., 1865, p. 33, pl. 204, 3 (not *O. cornutus* Linne).

A tropical species which is sometimes stranded on our ocean beaches. Length 9 inches.

366b. O. CORNUTUS. COW-FISH. *Id.* Linne, Syst. Nat. 10th. ed., 1758, p. 331. *O. arcus* Bleeker, Atlas. Ichth. v., 1865, p. 35, pl. 202, 3 (Pl. xliii.).

Another tropical species, occasionally wandering southward to Port Jackson. Length 15 inches.

367. LACTOPHRYS Swainson, Nat. Hist. Fish. Amph. Rept. ii., 1839, p. 324 (*trigonus*).

367a. L. STELLIFER. TURRET-FISH. *Ostracion stellifer* Block & Schneider, Syst. Ichth., 1801, p. 499, pl. 98. *Lactophrys tritropis* Snyder, Proc. U.S. Nat. Mus. xlii., 1912, p. 424, pl. 54, 1 (Pl. xliii.).

A widely distributed species, often stranded on our ocean beaches. Length 6 inches.

368. ANOPLOCAPROS Kaup, Arch. Naturg. xxi., 1855, p. 220 (*lenticularis*).

368a. A. LENTICULARIS. BOX-FISH. *Ostracion lenticularis* Richardson, P. Zool. Soc. 1841, p. 21. *Aracana lenticularis* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 95, pl. 17-18.

Commonly captured in nets on the coast. Length 12 inches.

CLX. Family TETRAODONTIDAE.

A. Each nostril a bifid tentacle, without distinct openings. *Tetraodon* (369).
AA. Each nostril with 2 distinct openings, usually in a low tube or papilla. *Spheroides* (370).

369. TETRAODON Linne, Syst. Nat. 10th. ed., 1758, p. 332 (*lineatus*).

A. Dorsal and anal fins each with 10-12 rays.
B. Back and sides with narrow longitudinal dark lines. *immaculatus* var. *manillensis* (369a).
BB. Back and sides without such lines.
C. Body with striking colour-marking, not uniform.
D. Back with white spots; belly usually striped with black. *hispidus* (369b).
DD. Back with brown spots; belly with or without black stripes or spots. *aerostaticus* (369c).
CC. Colouration largely uniform.
E. A blackish ring around the pectoral fin; skin nearly smooth. *armilla* (369d).
EE. Orange with scattered black spots; skin intensely bristly. *nigropunctatus* var. *citrinellus*, (369e).
AA. Dorsal and anal fins each with 14 rays; body covered with rounded white spots. *firmamentum* (369f).

369a. T. IMMACULATUS, var. MANILLENSIS. *Tetraodon manillensis* Proce, Bull. Philom., 1822, p. 130. *T. virgatus* Richardson, Ichth. Erebus & Terror, 1846, p. 62, pl. 39, 8-9.

A variety of *T. immaculatus* which is uniformly coloured and without the dark longitudinal lines characteristic of var. *manillensis*. Length 10 inches.

369b. T. HISPIDUS. *Id.* Linne, Syst. Nat. 10th. ed., 1758, p. 333. *Crayracion laterna* Bleeker, Atlas Ichth. v., 1865, p. 71, pl. 205, 3.

A tropical species, which is not reliably recorded from New South Wales. Length 20 inches.

369c. T. AEROSTATICUS. BALLOON-FISH. *Id.* Jenyns, Zool. Beagle iii., 1842, p. 152. *Crayracion lineatus* Bleeker, Atlas Ichth. v., 1865, p. 70, pl. 212, 1. *T. amabilis* Castlenau, P.L.S. N.S.W. iii., 1879, p. 401.

A tropical species, of which young specimens occasionally stray southward to Port Jackson. *T. amabilis* Castlenau, was described from a specimen 4½ inches long from Port Jackson in 1879, since which time the species has not been recognised. A local example of similar size is in the Australian Museum which, while agreeing well with Bleeker's figure quoted above, presents sufficient of the characters described by Castlenau as to leave little doubt that *amabilis* is synonymous with *aerostaticus*.

369d. T. ARMILLA. *Id.* Waite & McCulloch, Tr. Roy. Soc. S. Austr. xxxix., 1915, p. 475, pl. 15.

A southern species from deep water which is sometimes taken by trawlers. Length 8 inches.

369e. T. NIGROPUNCTATUS, var CITRINELLUS. *Id.* Gunther, Brit. Mus. Cat. Fish. viii., 1870, p. 293. *T. aurantius* Ogilby, Rec. Austr. Mus. i. 4, 1890, p. 80.

The type of *T. aurantius* is badly stuffed, but leaves little doubt that it is referable to the orange-coloured form of *T. nigropunctatus*. It is the only example of the species known from New South Wales, and was doubtless a straggler from the tropics. Length 11 inches.

369f. T. FIRMAMENTUM. STARRY TOADO. *Id.* Schlegel, Faun. Japonica Pisces, 1850, p. 280, pl. 126, 2 (Pl. xliii.).

A rare species, occurring in deeper water. Length 16 inches.

370. SPHEROIDES Dumeril, Zool. Analytique, 1806, p. 342 (*tuberculatus*).

A. Gill-opening without a cartilaginous spur projecting beyond the margin.
  B. Dorsal and anal fins pointed, their posterior rays less than half as long as the third.
    C. Back entirely smooth; 11-12 dorsal rays. *inermis* (370a).
    CC. Back with more or less numerous spinules.
      D. Caudal peduncle wider than deep immediately behind dorsal fin; 10-12 dorsal rays. *sceleratus* (370b).
      DD. Caudal peduncle deeper than wide immediately behind dorsal fin; 12 dorsal rays. *spadiceus* (370c).
  BB. Dorsal and anal fins subquadrangular or rounded, the posterior rays more than half as long as the third.
    E. Back without dark spots, but with cross-bands.
      F. Nape with small spines. *oblongus* (370d).
      FF. Nape without spines. *pleurostictus* (370e).
    EE. Back with numerous dark spots; dark cross-bars usually present. *hamiltoni* (370f).
AA. A cartilaginous spur projecting backward beyond margin of lower half of gill-opening; a dark stripe along each side, back with light spots. *pleurogramma* (370g).

370a. S. INERMIS. SMOOTH TOADO. *Tetrodon inermis* Schlegel, Faun. Japonica Pisces, 1850, p. 278, pl. 122, 2.

A smooth silvery fish, which, like all others of the genus, is said to be poisonous if eaten. Length 18 inches.

370b. S. SCELERATUS. GIANT TOADO. *Tetrodon sceleratus* Gmelin, Syst. Nat. ii., 1789, p. 1444. *T. argenteus* Bleeker, Atlas Ichth. v., 1865, p. 64, pl. 209, 1 (Pl. xliii.).

A widely distributed species extending southward to Port Jackson. Length 30 inches.

370c. S. SPADICEUS. SILVER TOADO. *Tetrodon spadiceus* Richardson, Voy. Sulphur, Ichth., 1844, p. 123, pl. 58, 4-5.

Occurs in deep water and is often taken by trawlers. Length about 12 inches.

370d. S. OBLONGUS. *Tetrodon oblongus* Bloch, Ausl. Fische ii., 1786, p. 6; *Id.* Bleeker, Atlas Ichth. v., 1865, p. 62, pl. 208, 4.

Taken in deep water by trawlers. Length 15 inches.

370e. S. PLEUROSTICTUS. BANDED TOADO. *Tetrodon pleurostictus* Gunther, P. Zool. Soc. 1871, p. 674, pl. 69, a.

Common in the estuaries of northern rivers. Length 6 inches.

370f. S. HAMILTONI. COMMON TOADO. *Tetrodon hamiltoni* Richardson, Ichth. Erebus & Terror, 1846, p. 63, pl. 39, 10-11 (Pl. xliii.).

Very common in all shallow waters along the coast. Length 5½ inches.

370g. S. PLEUROGRAMMA. *Tetrodon pleurogramma* Regan, P. Zool. Soc. 1902, ii., 1903, p. 300, pl. 24, 2.

Not uncommon. Length 7 inches.

McCulloch and Waite, Tr. Roy. Soc. S. Aust. xl., 1916, p. 450, have united this species with *S. altipinnis* Ogilby, but this is apparently incorrect.

The specimen recorded as *Tetrodon erythrotaenia* from Sydney by Kner, Novara Zool. i., 1867, p. 408, was perhaps referable to *S. pleurogramma*.

S. richei Freminville, has been recorded from Sydney by Kner, Novara Zool. 1, 1867, p. 407. Though common in Southern Australia, there is no evidence that it occurs in New South Wales waters.

CLXI. Family DIODONTIDAE.

A. All the spines with two roots and movable. *Diodon* (371).

AA. Most of the spines fixed, with 3 roots.

B. Anterior spines 2-rooted and movable; about 12 dorsal and anal rays. *Dicotylichthys* (372).

BB. Anterior spines 3-rooted; 15-16 dorsal and anal rays. *Allomycterus* (373).

371. DIODON Linne, Syst. Nat. 10th. ed., 1758, p. 334 (*hystrix*).

371a. D. HOLOCANTHUS. *Id.* Linne, *Ibid.*, p. 335. *Paradiodon quadrimaculatus* Bleeker, Atlas Ichth. v., 1865, p. 58, pl. 212, 2.

A tropical species of which the young sometimes wander southward into New South Wales. Length 12 inches.

D. hystrix Linne, was included in a mere list of Port Jackson fishes by Castlenau, P.L.S. N.S.W. iii., 1879, p. 357. As it has not been since recognised from these waters, further proof of its occurrence is necessary.

372. DICOTYLICHTHYS Kaup, Arch. Naturg. xxi., 1855, p. 230 (*punctulatus*).

372a. D. PUNCTULATUS. PORCUPINE-FISH. *Id.* Kaup, *Ibid.*; *Id.* Waite, Mem. Austr. Mus. iv. i., 1899, p. 98, pl. 19 (Fl. xliii.).

Very common in estuaries and inlets along the coast. Length 12 inches.

373. ALLOMYCTERUS McCulloch, Rec. Austr. Mus. xiii. 4, 1921, p. 141 (*jaculiferus*).

373a. A. JACULIFERUS. PORCUPINE-FISH. *Diodon jaculiferus* Cuvier, Mem. Mus. Hist. Nat. iv., 1818, p. 130, pl. 7. *A. jaculiferus* McCulloch, Rec. Austr. Mus. xiii. 4, 1921, p. 141, pl. 33, 2.

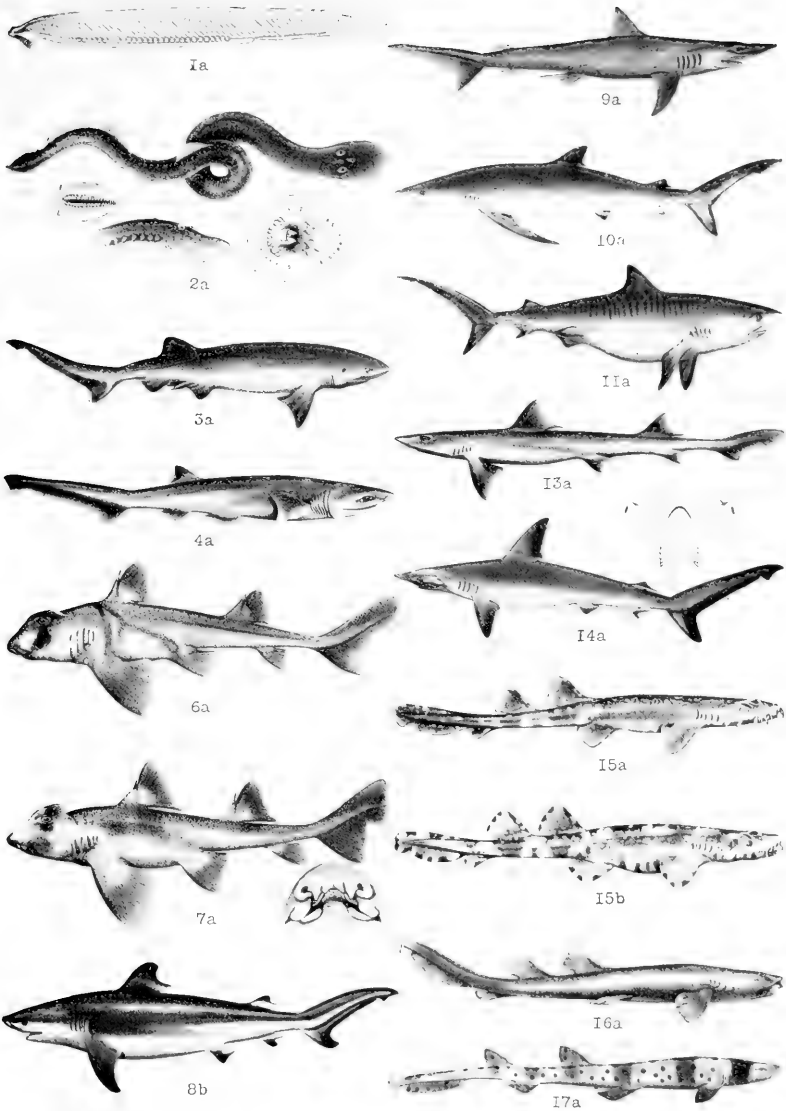
Commonly taken by trawlers in moderately deep water. Length 12 inches.

CLXII. Family MOLIDAE.

374. MOLA Koelreuter, Novi Comm. Act. Petropol. viii., 1770, p. 337 (*aculeata*).

374a. M. MOLA. SUN-FISH. *Tetrodon mola* Linne, Syst. Nat. 10th. ed., 1758, p. 334. *Orthagoriscus mola* Schlegel, Faun. Japonica, Pisces, 1850, p. 288, pl. 127 (Pl. xliii.).

Apparently not rare off the coast, and occasionally stranded on ocean beaches. Length 10 feet.



T. C. Roughley, Photo.

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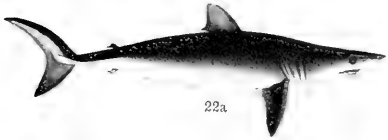

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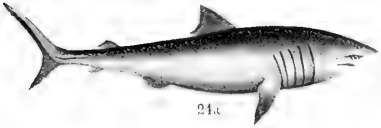

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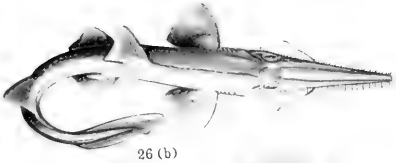

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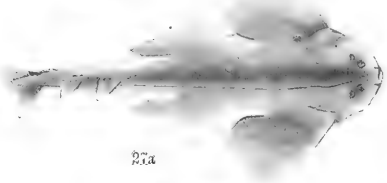

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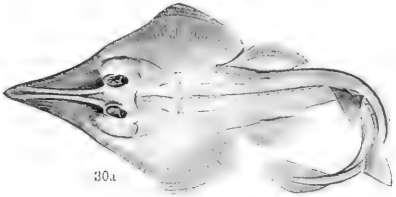

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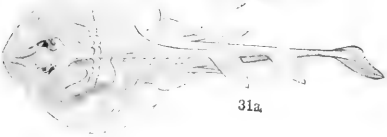

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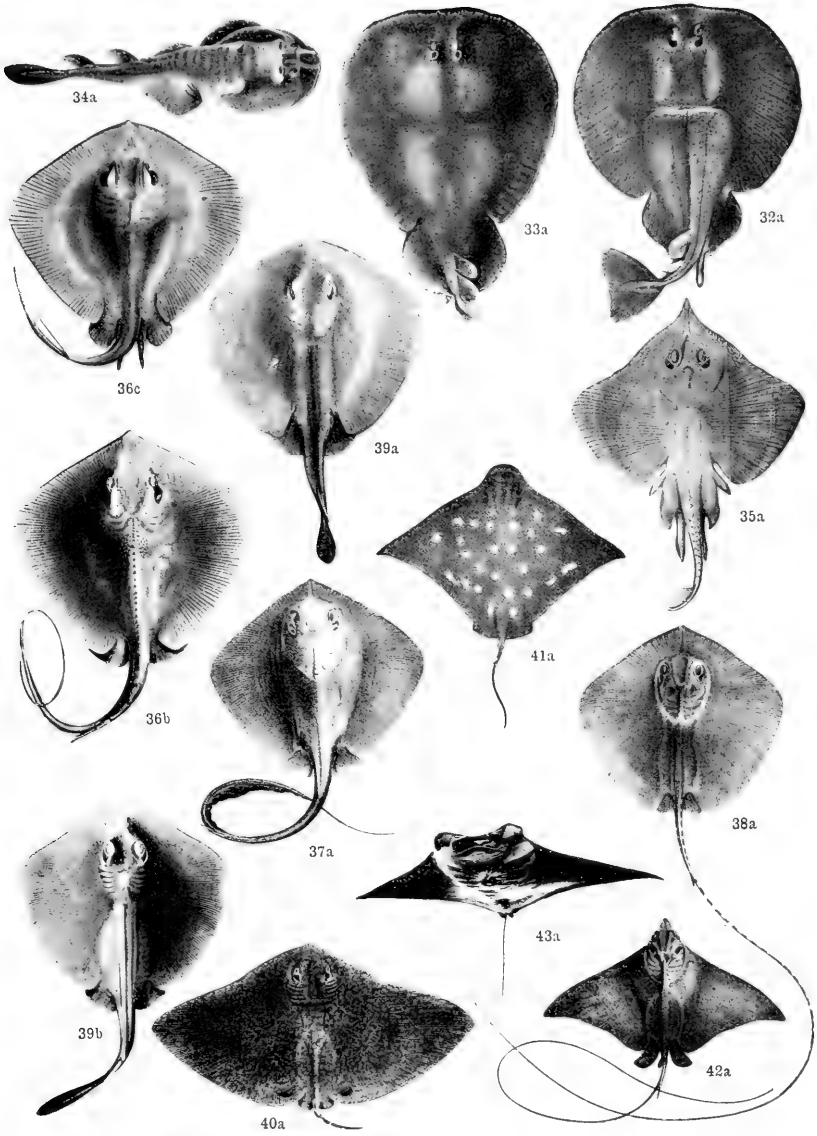

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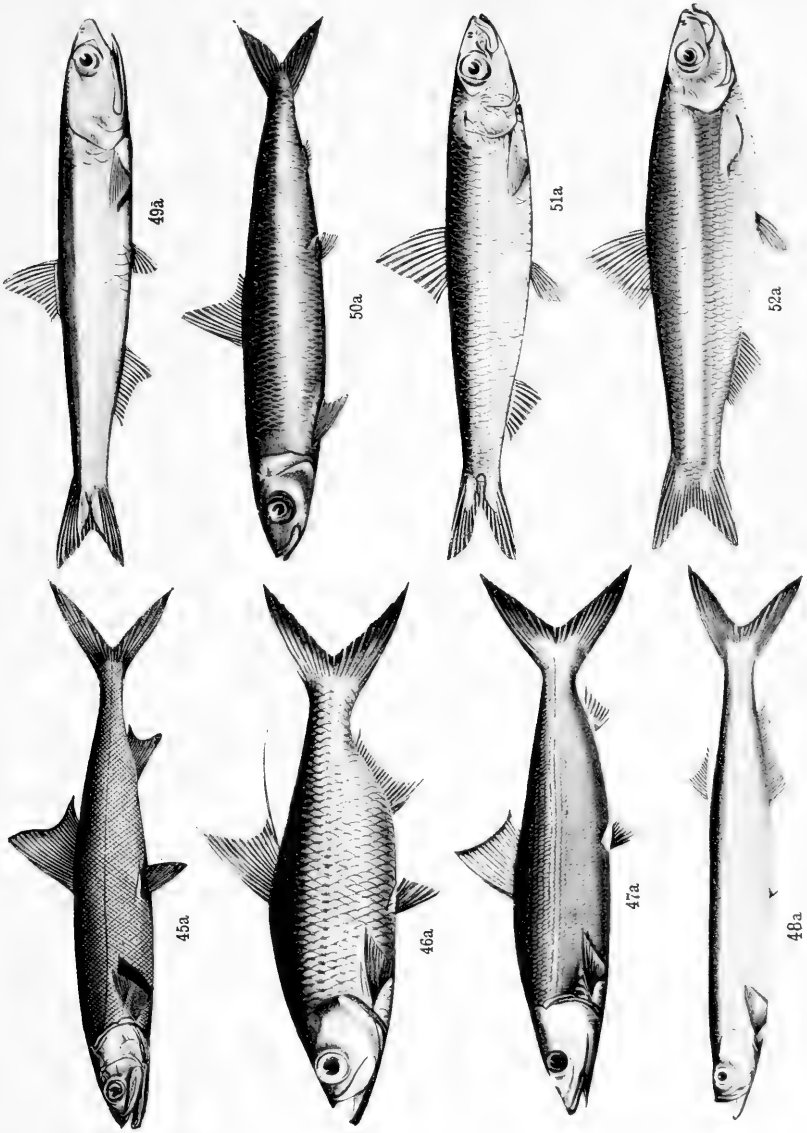

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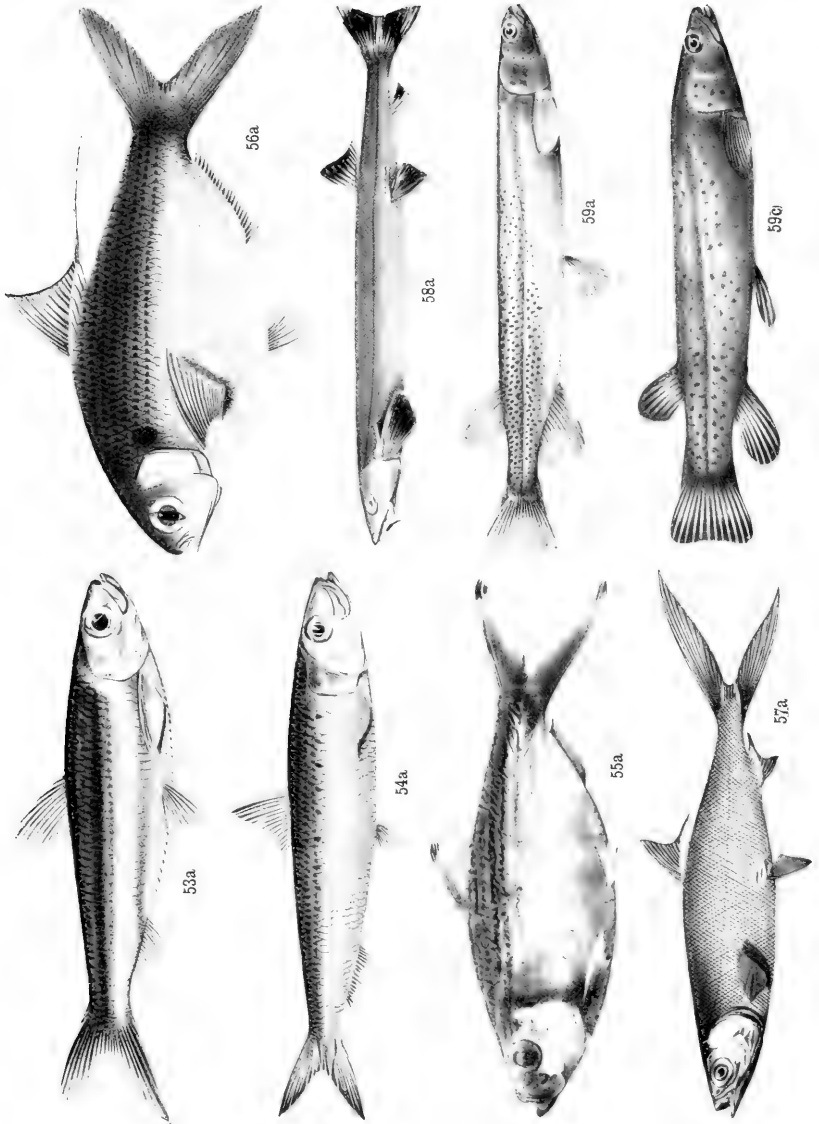

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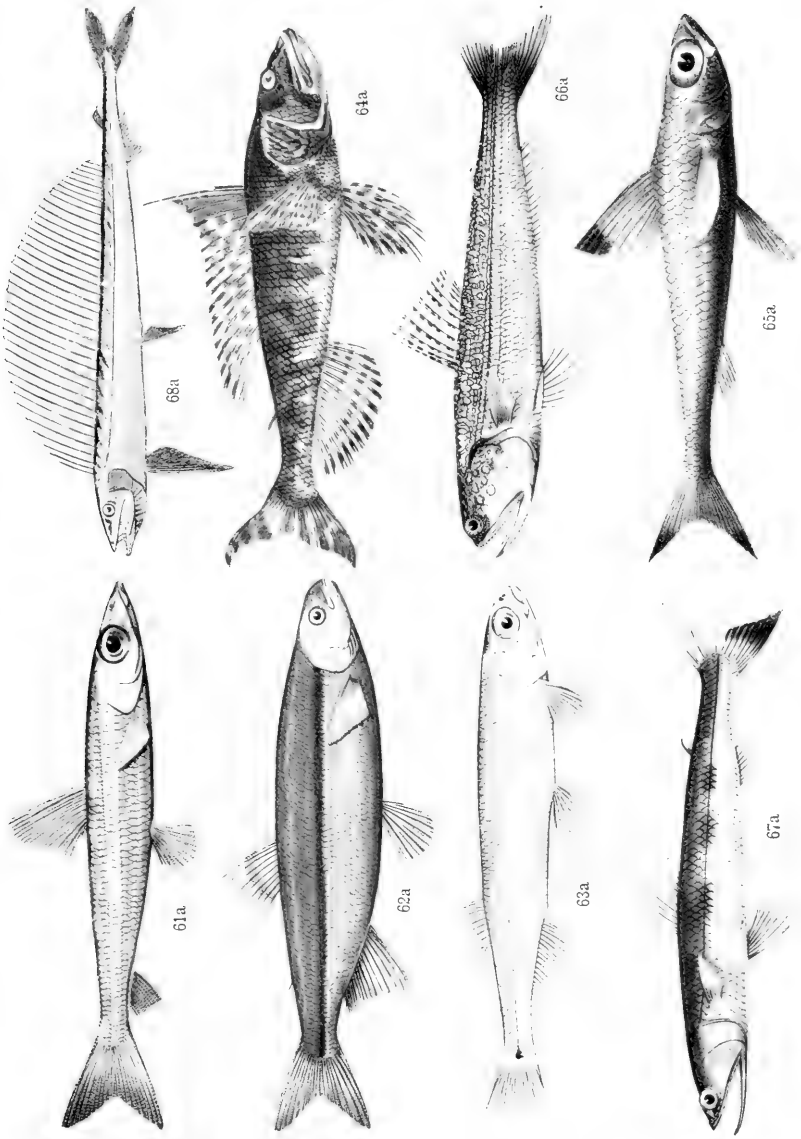

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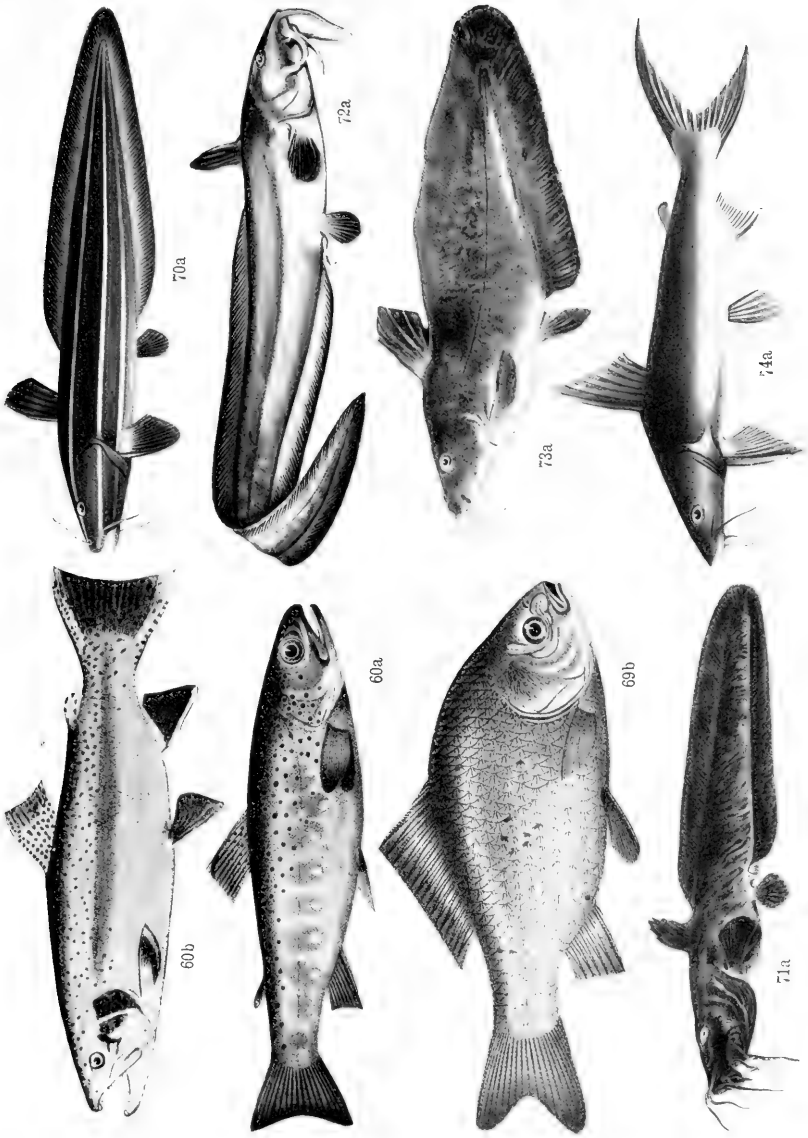

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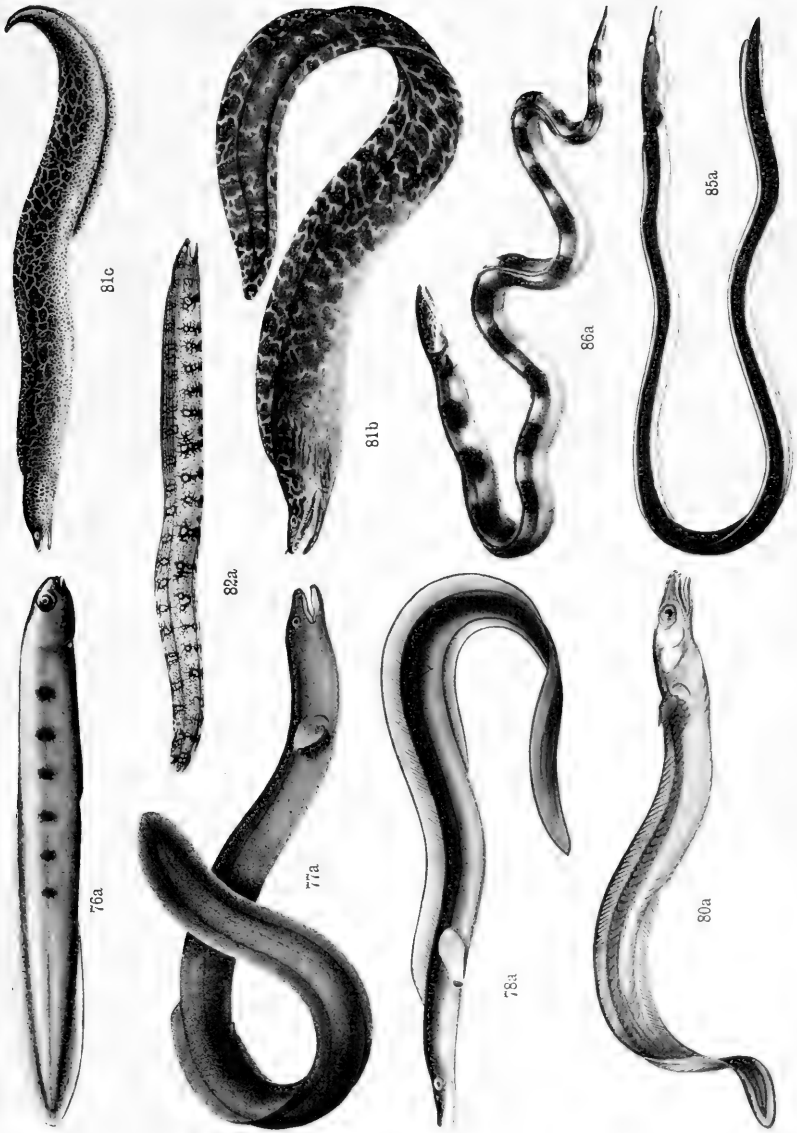

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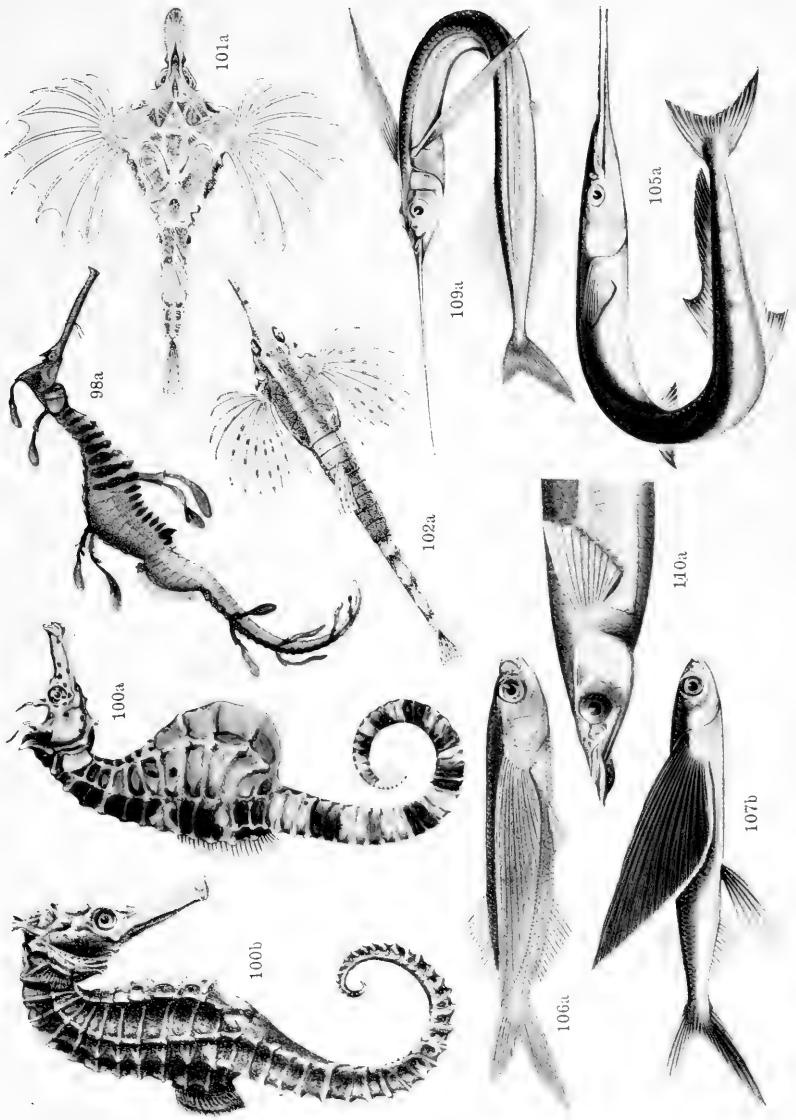

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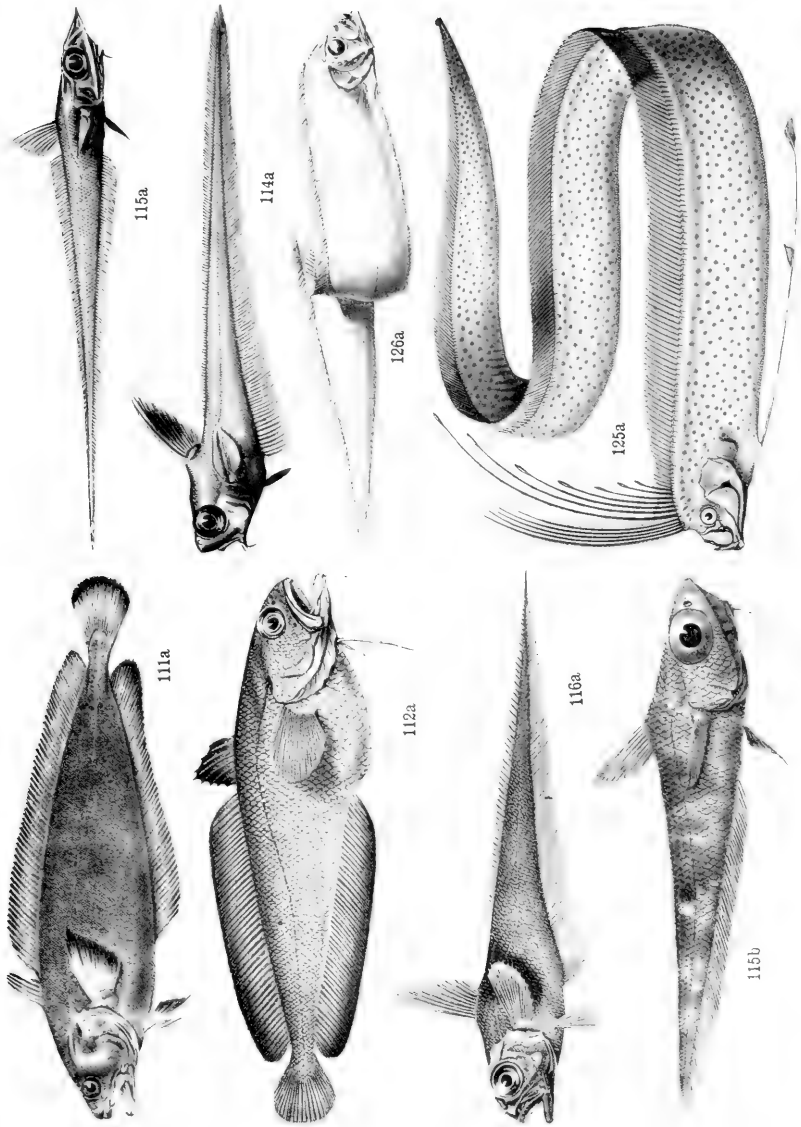

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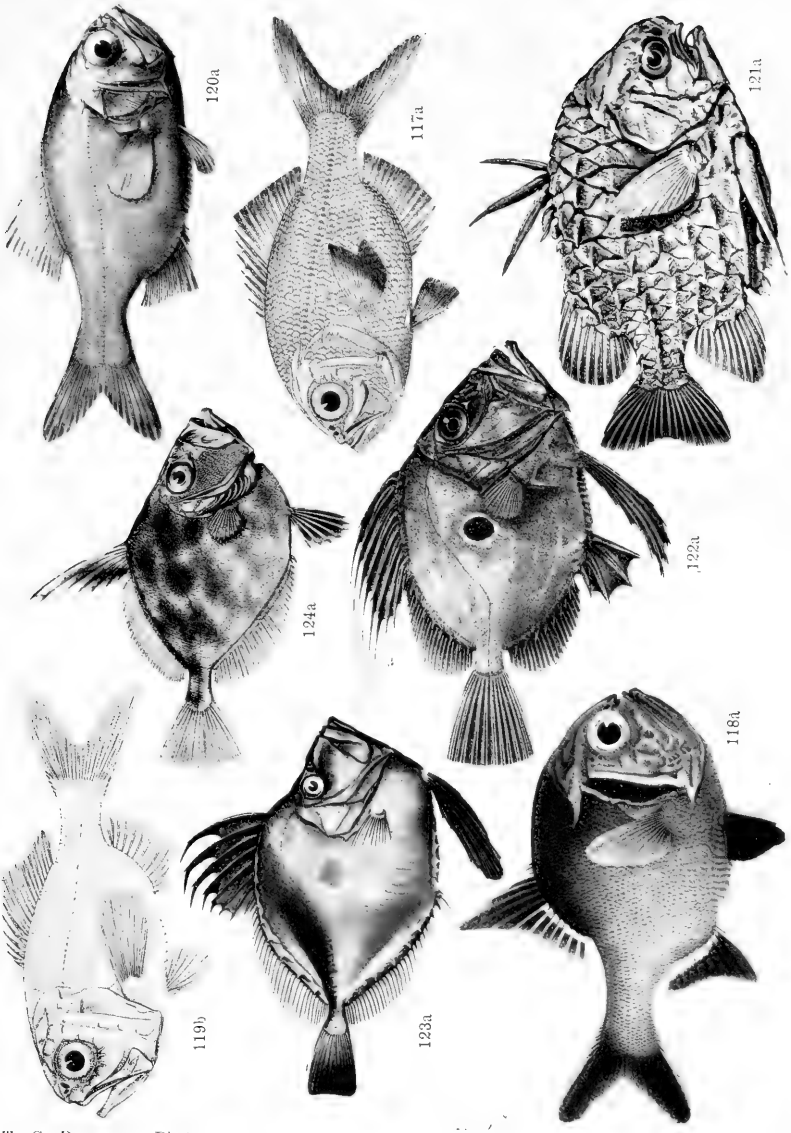

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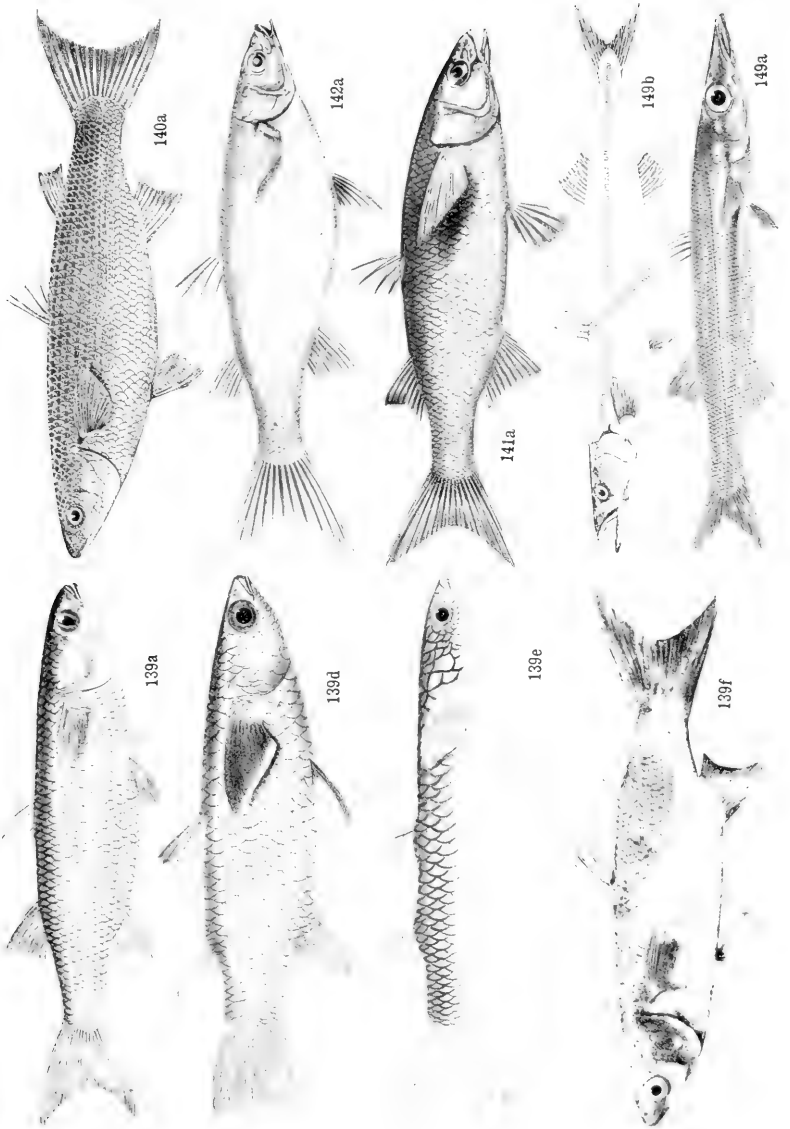

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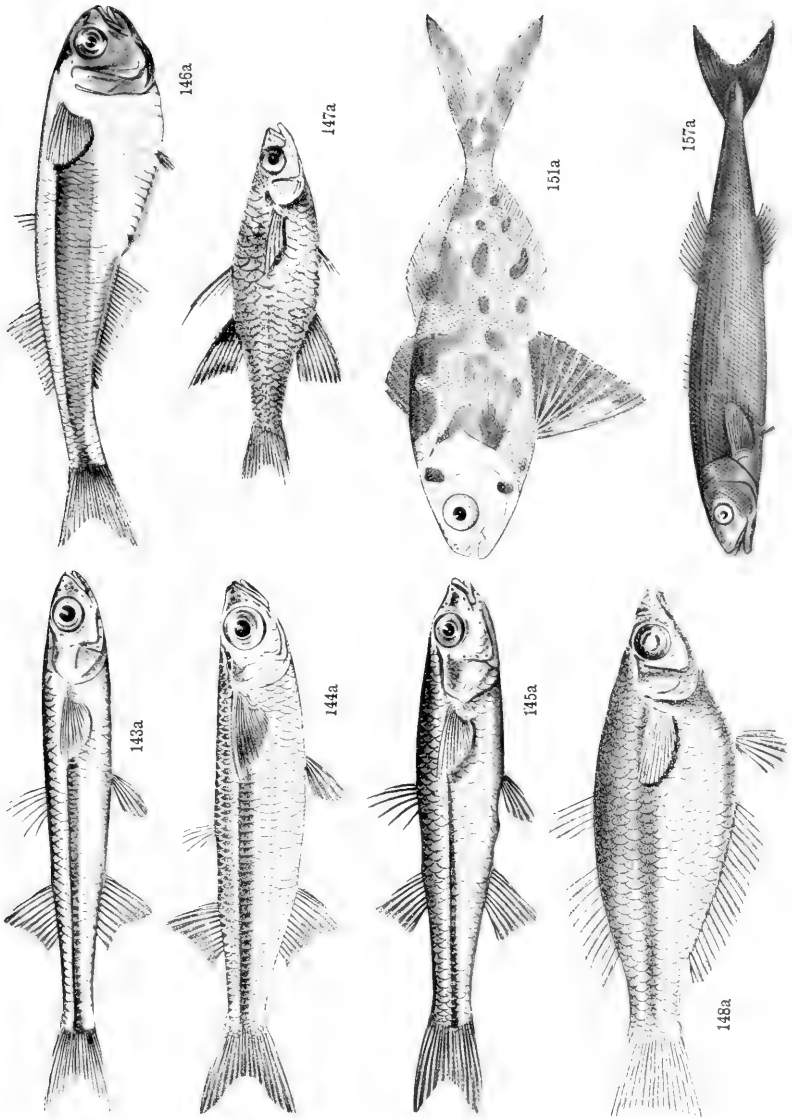
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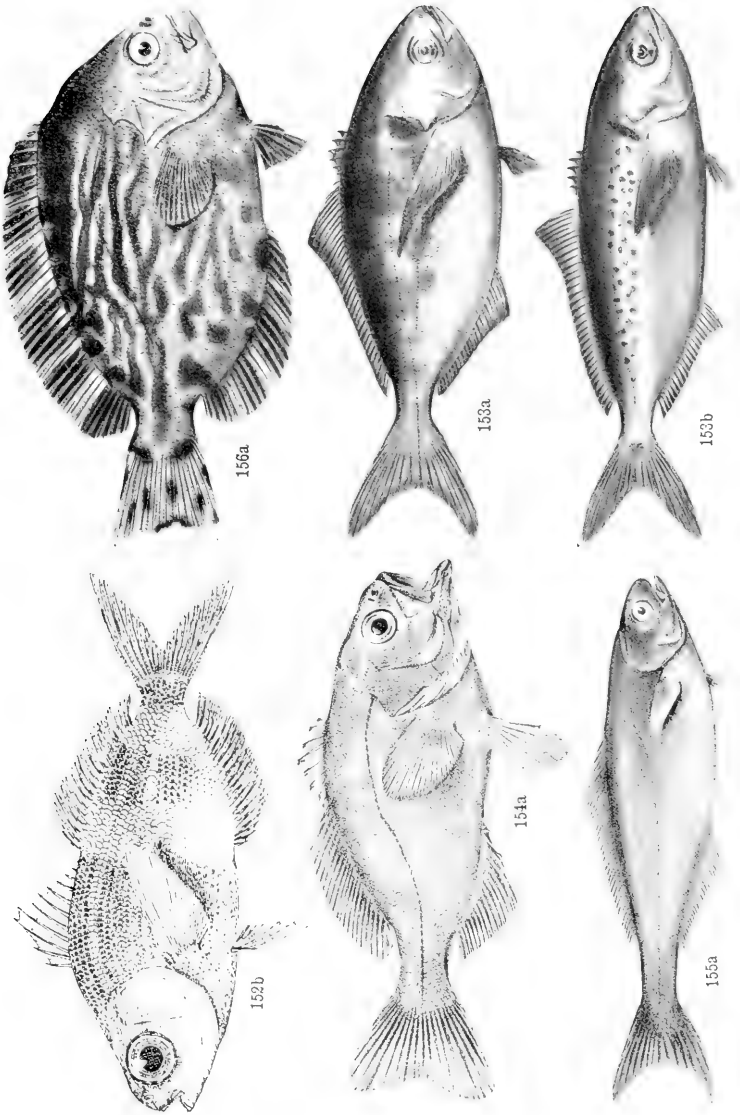

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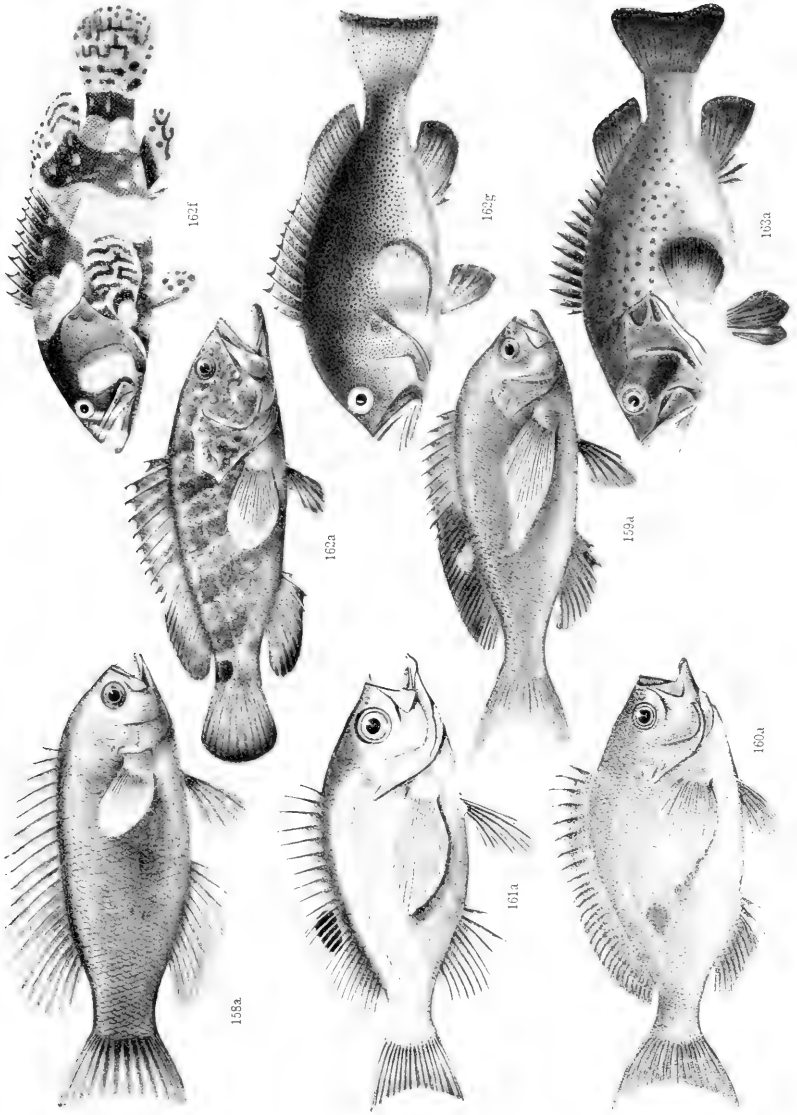
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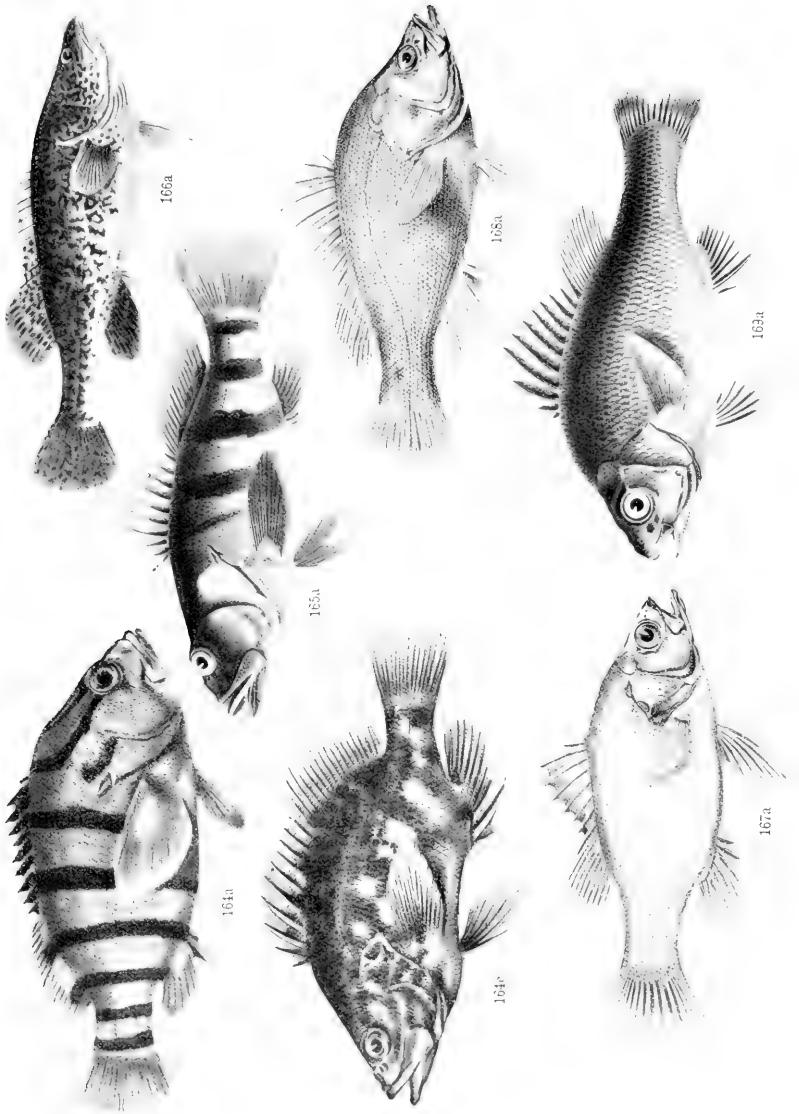

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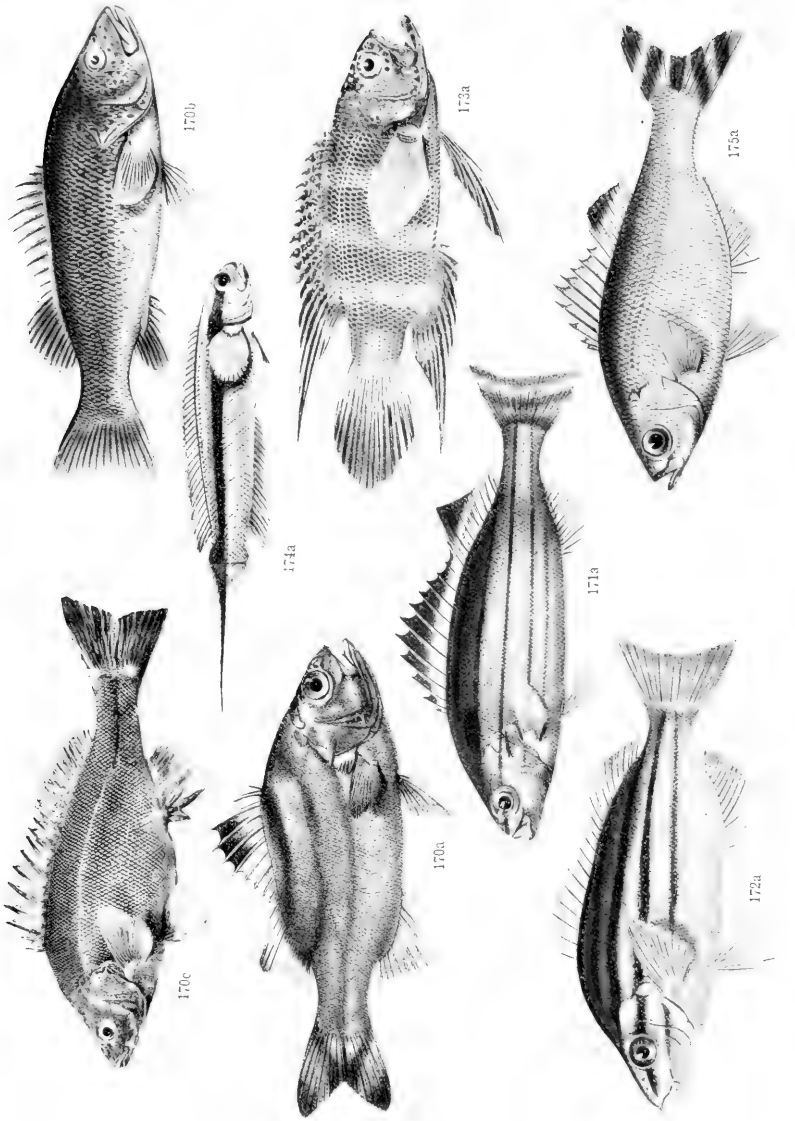

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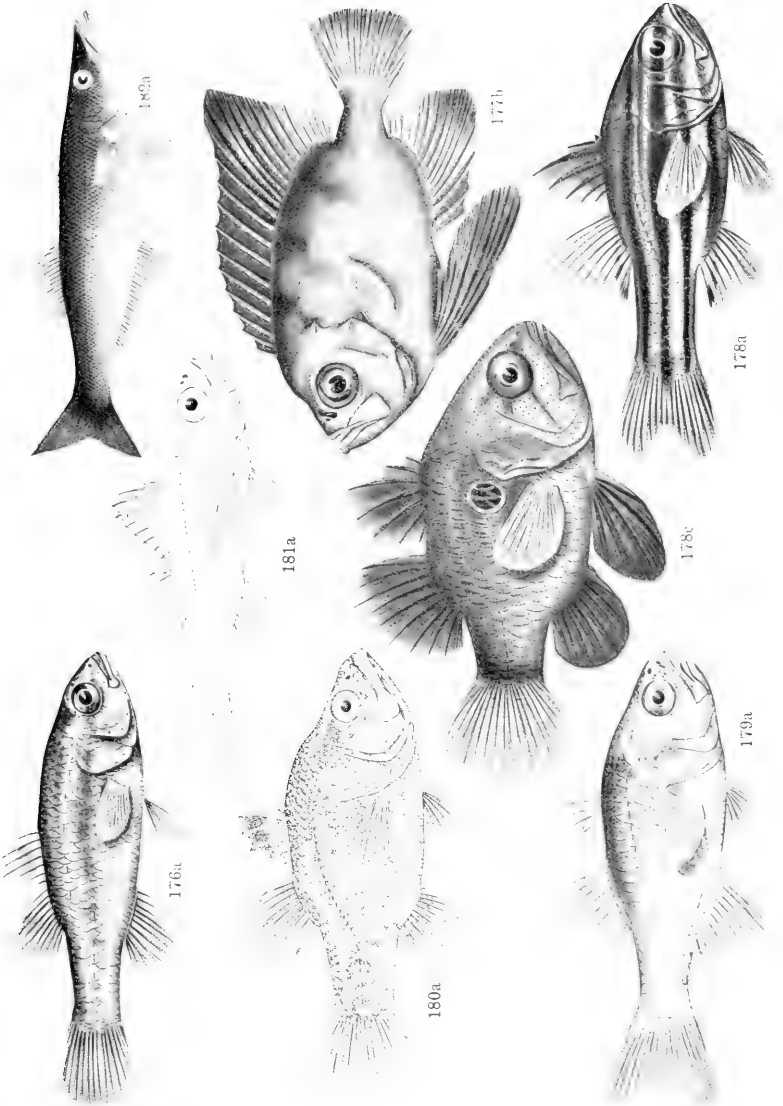

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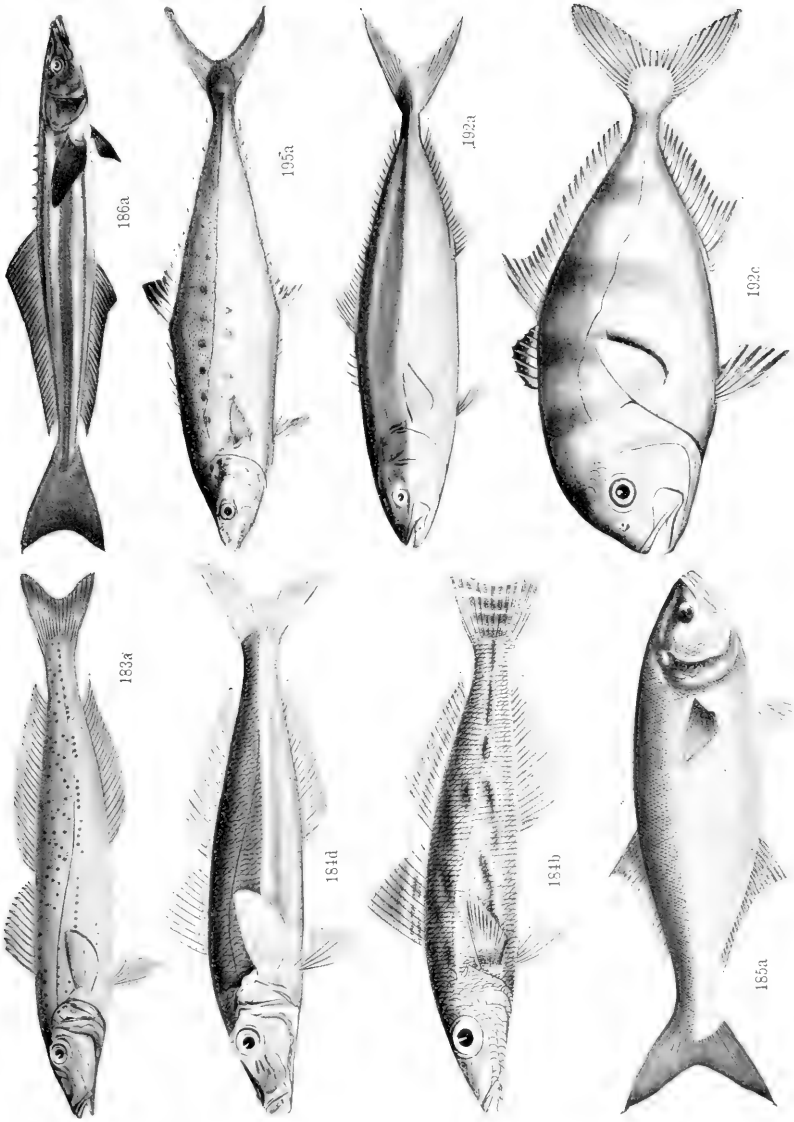

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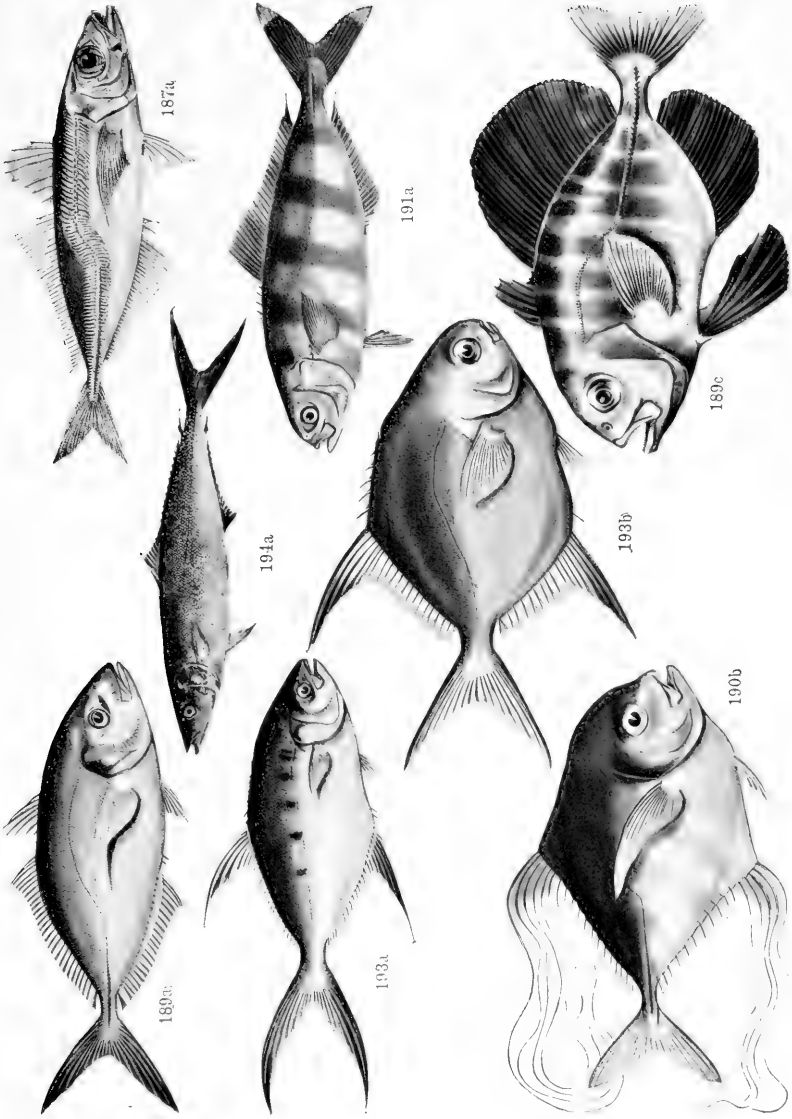

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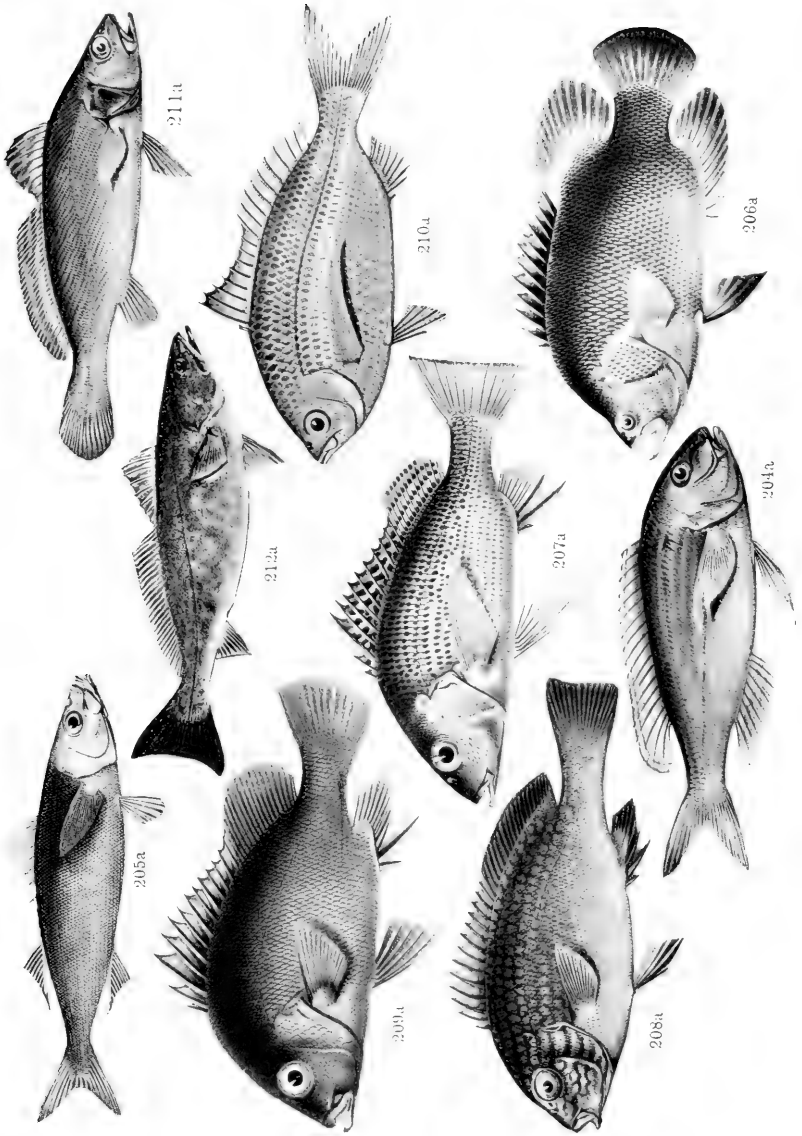

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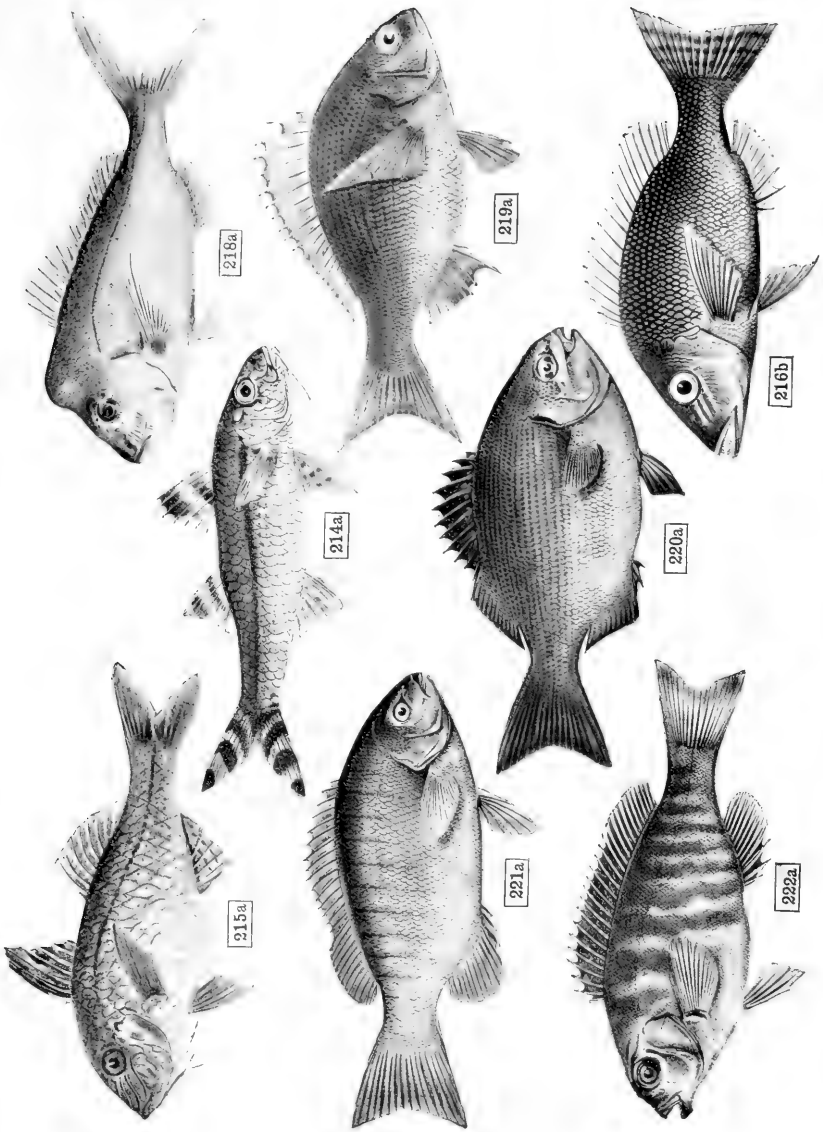

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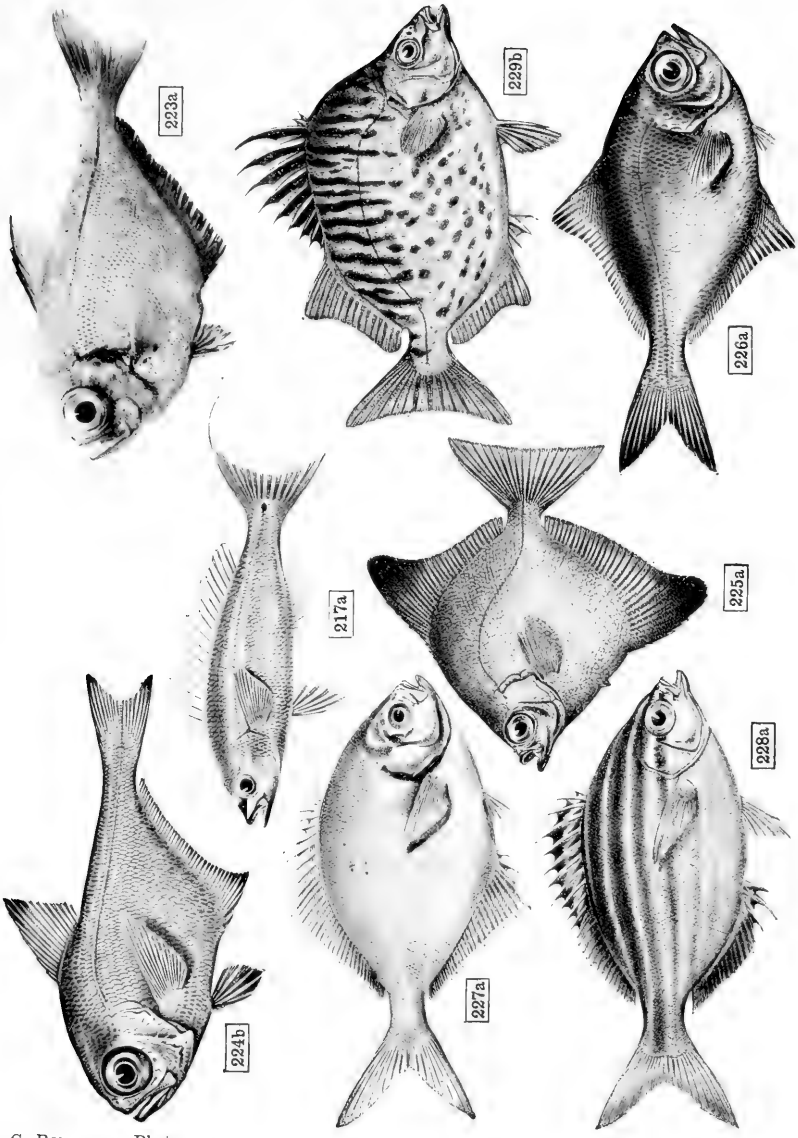

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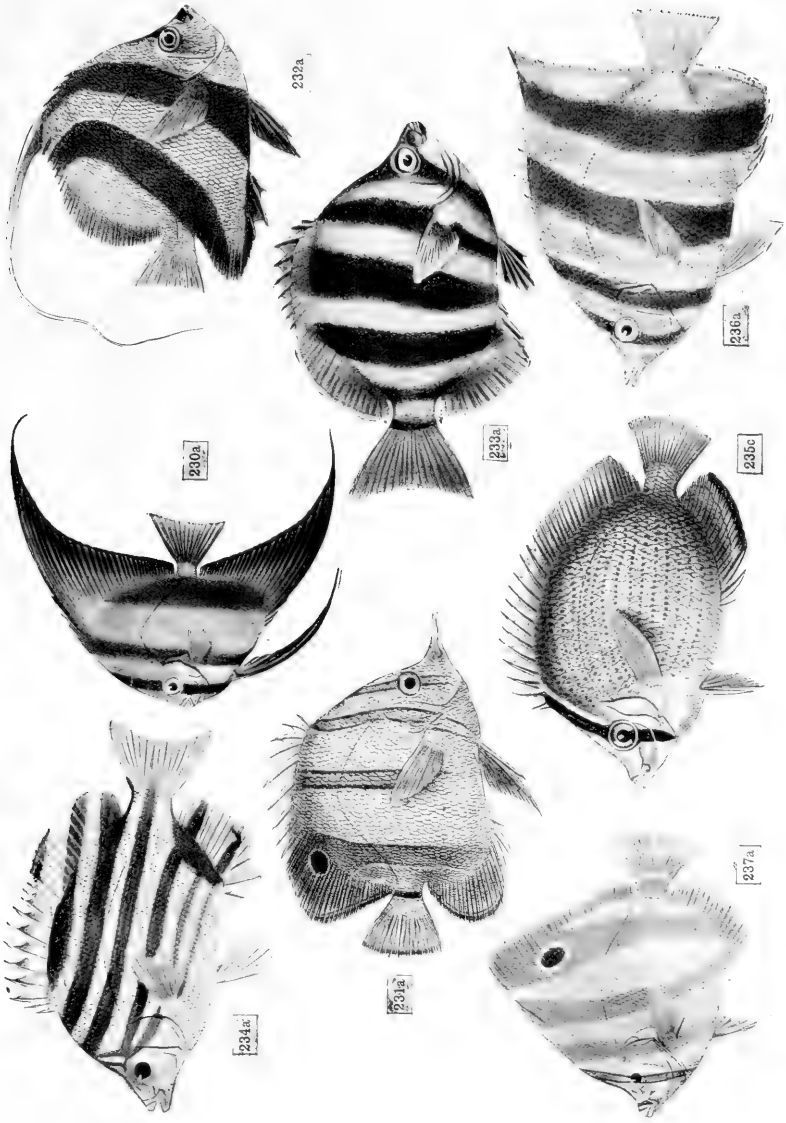

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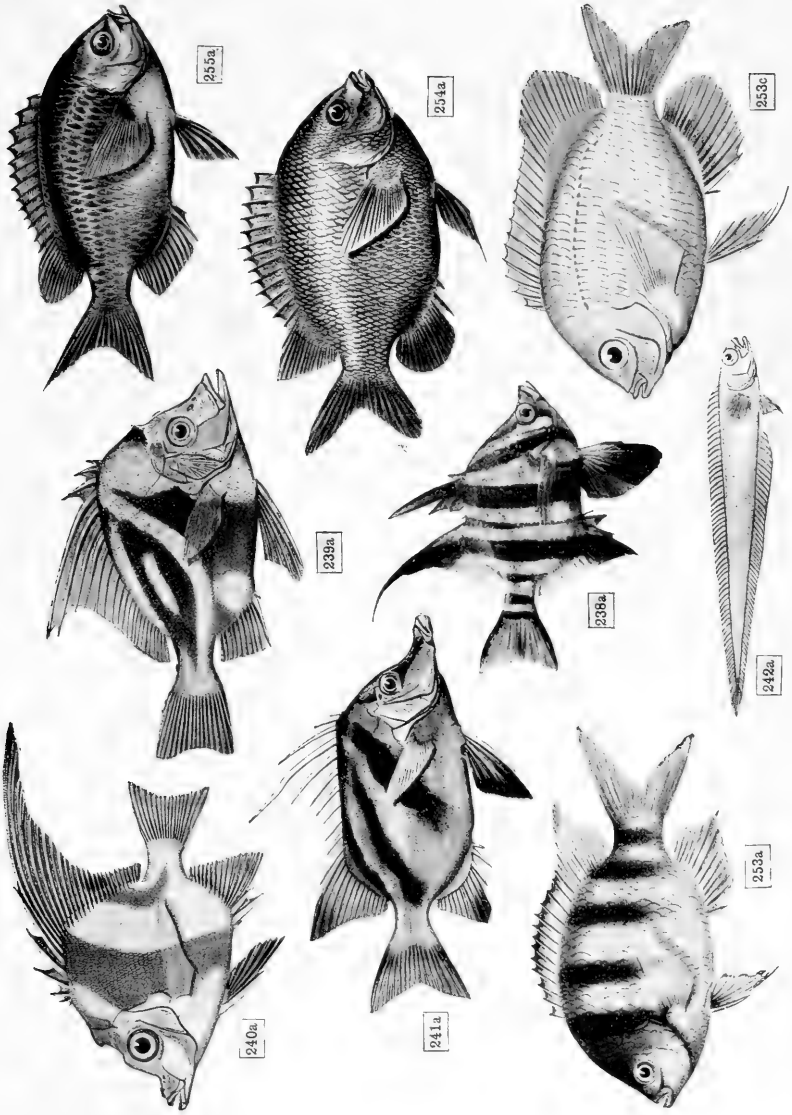

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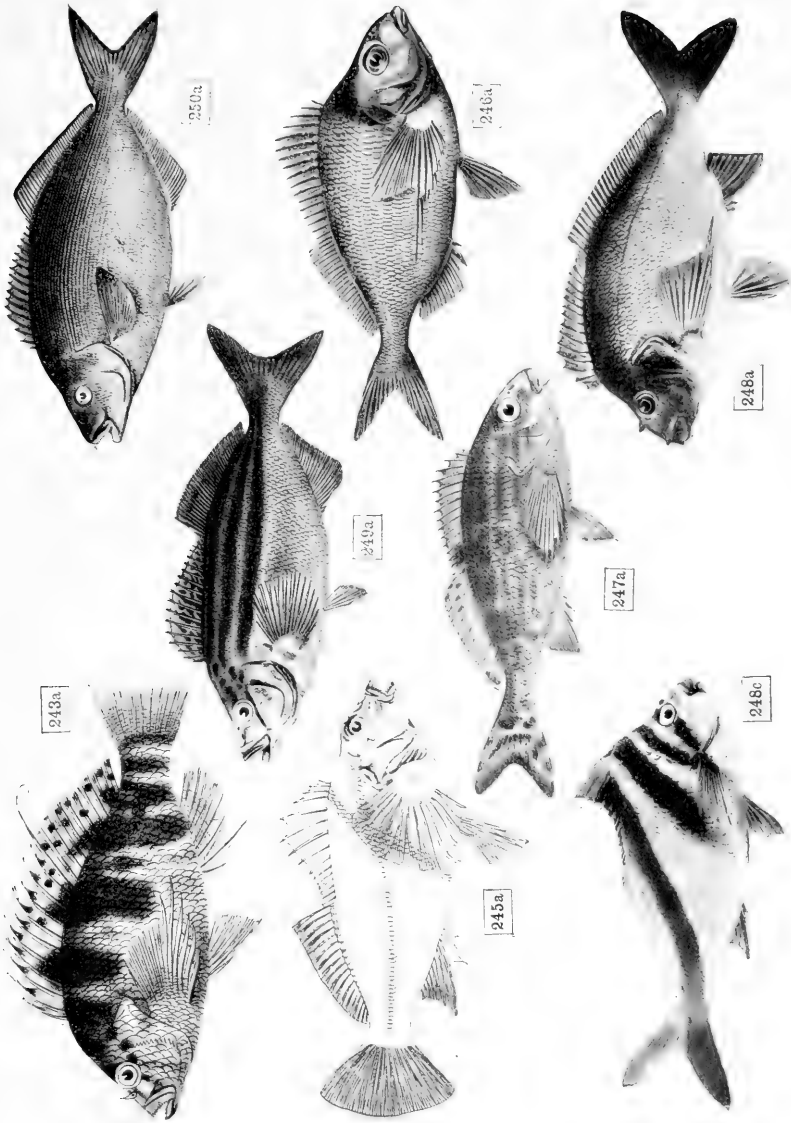

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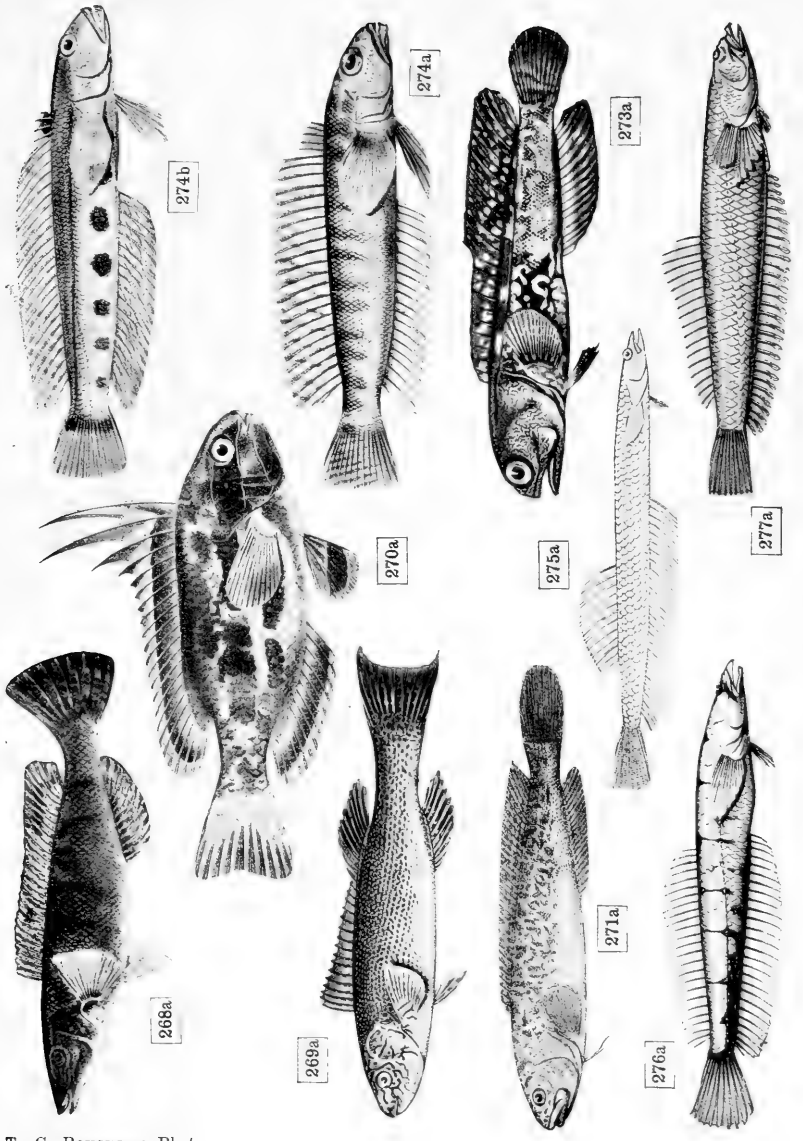

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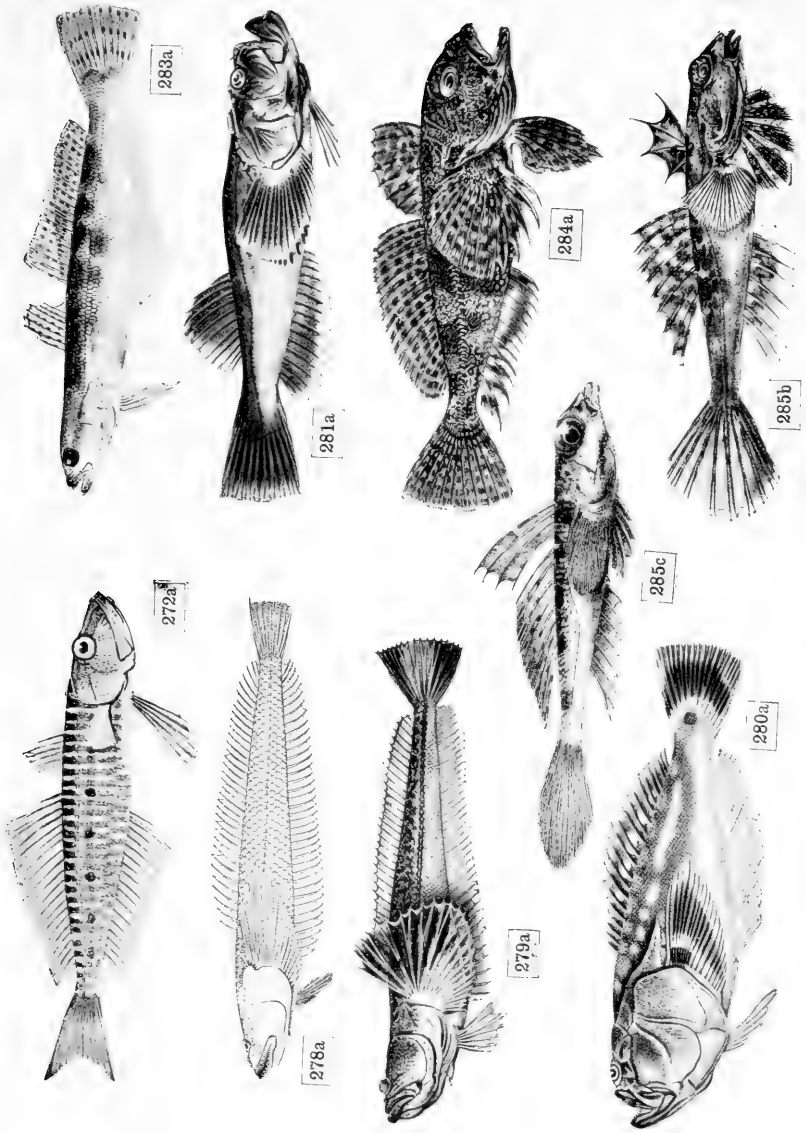

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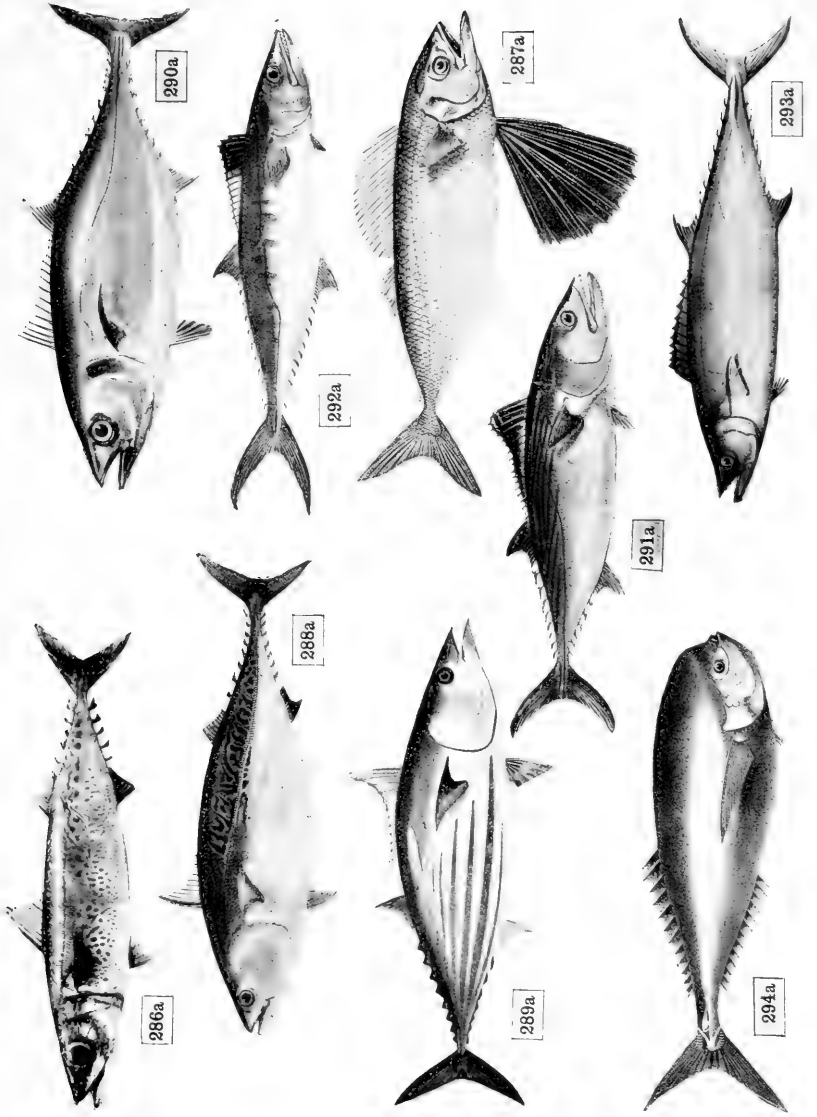

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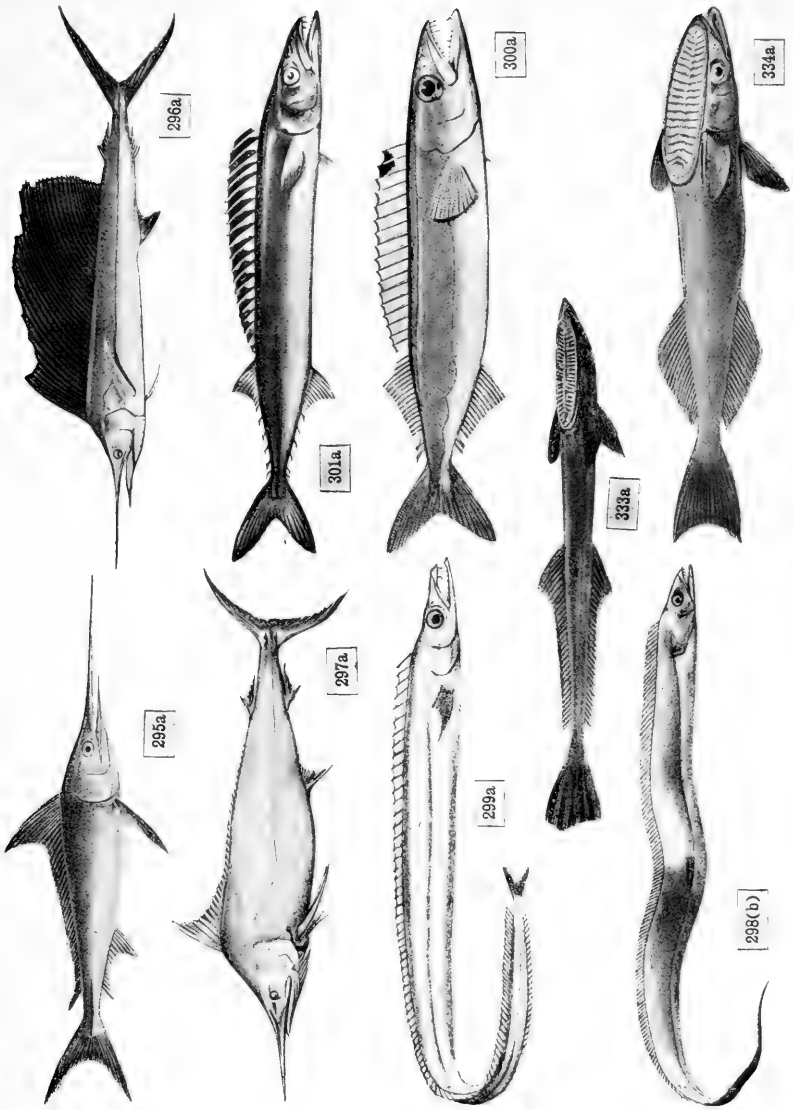

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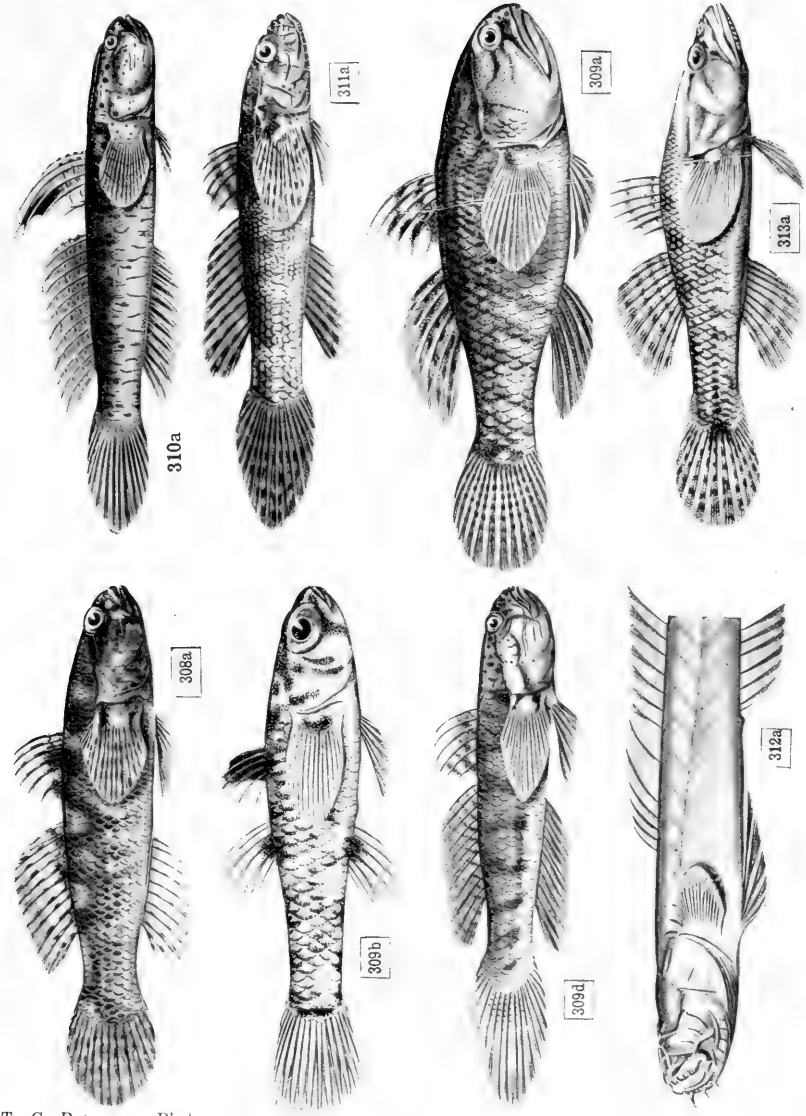

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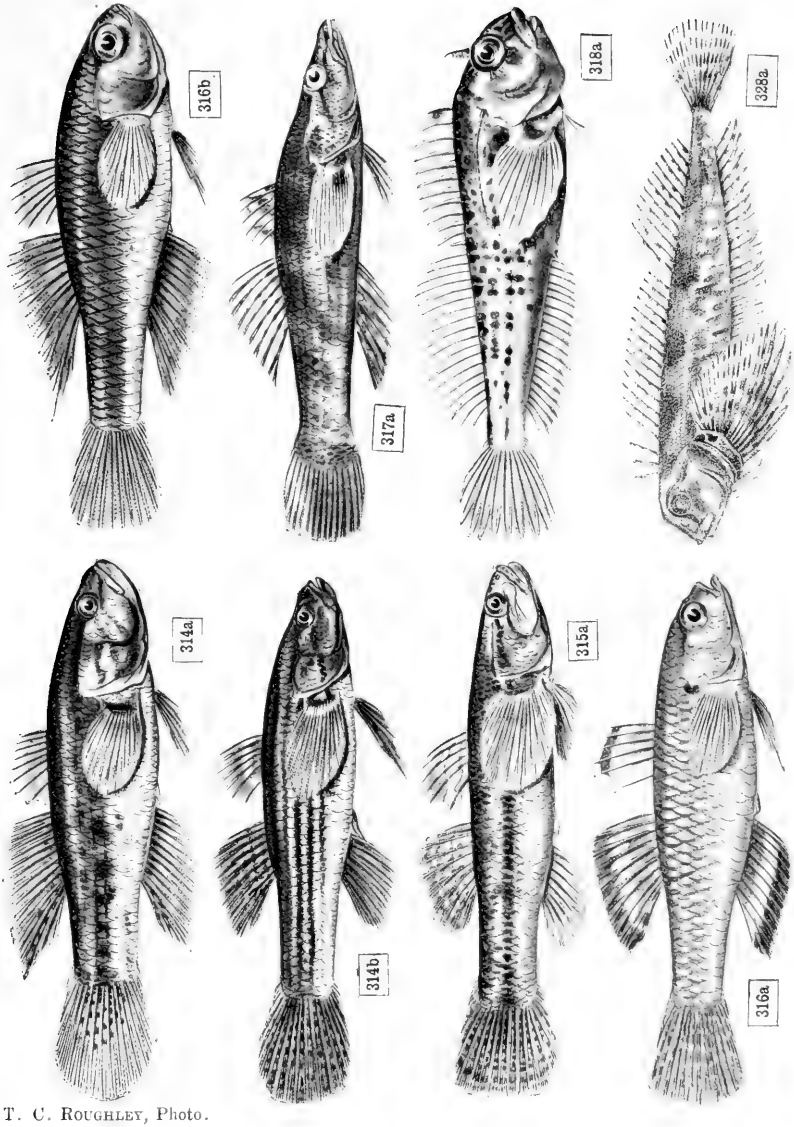

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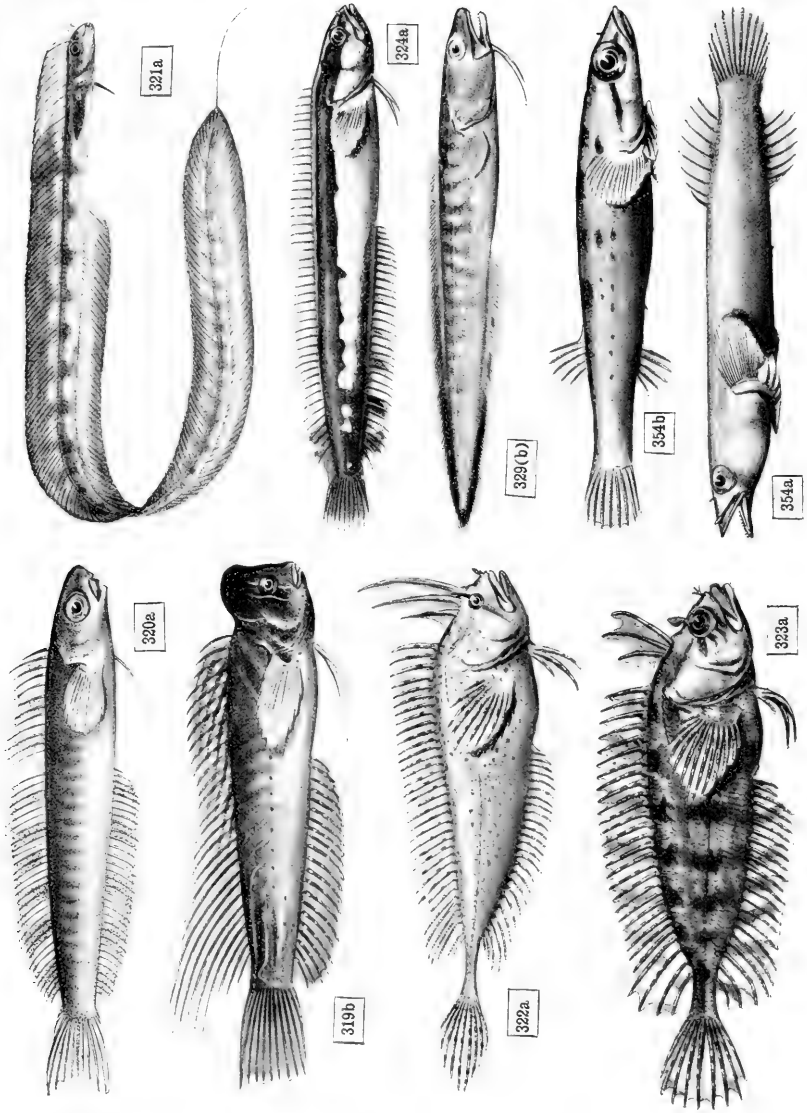

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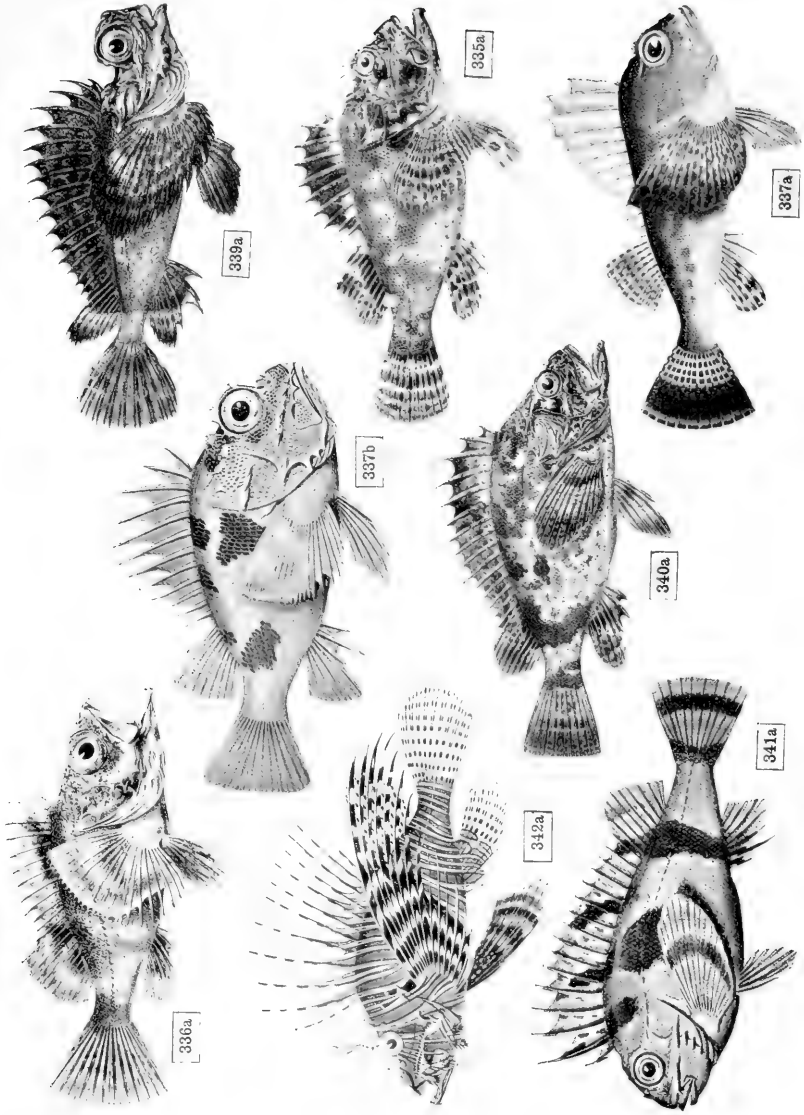

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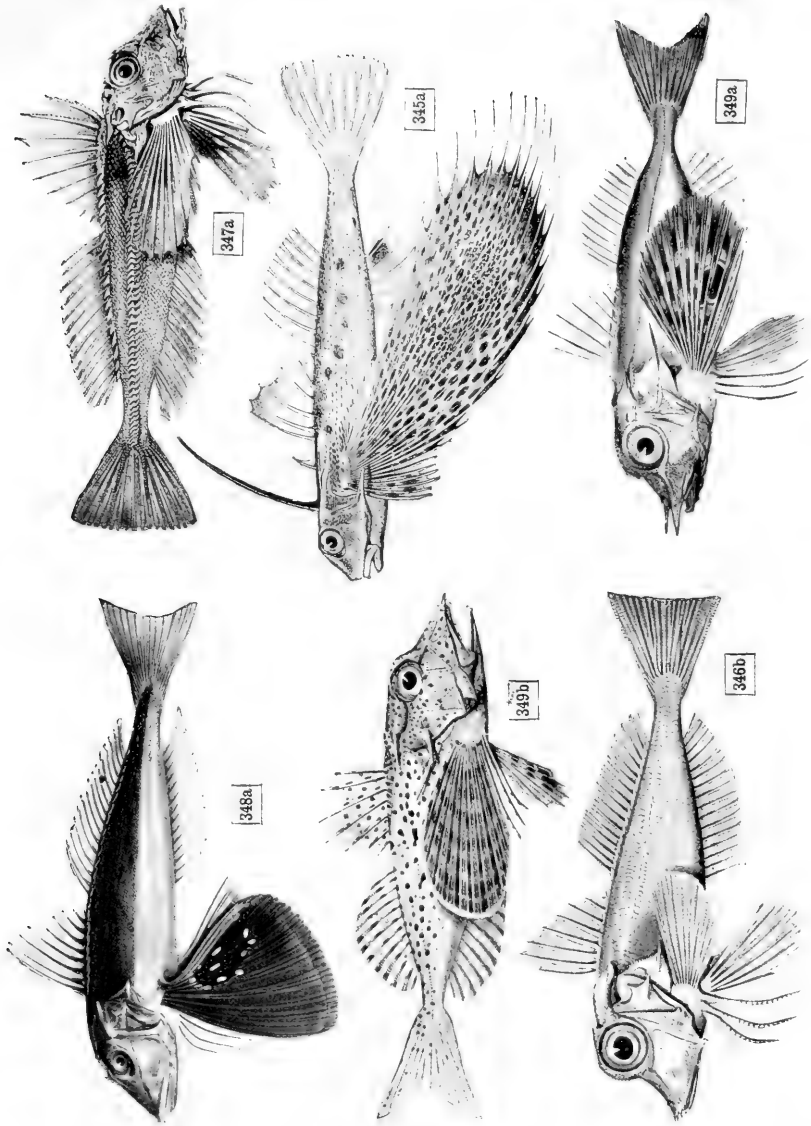

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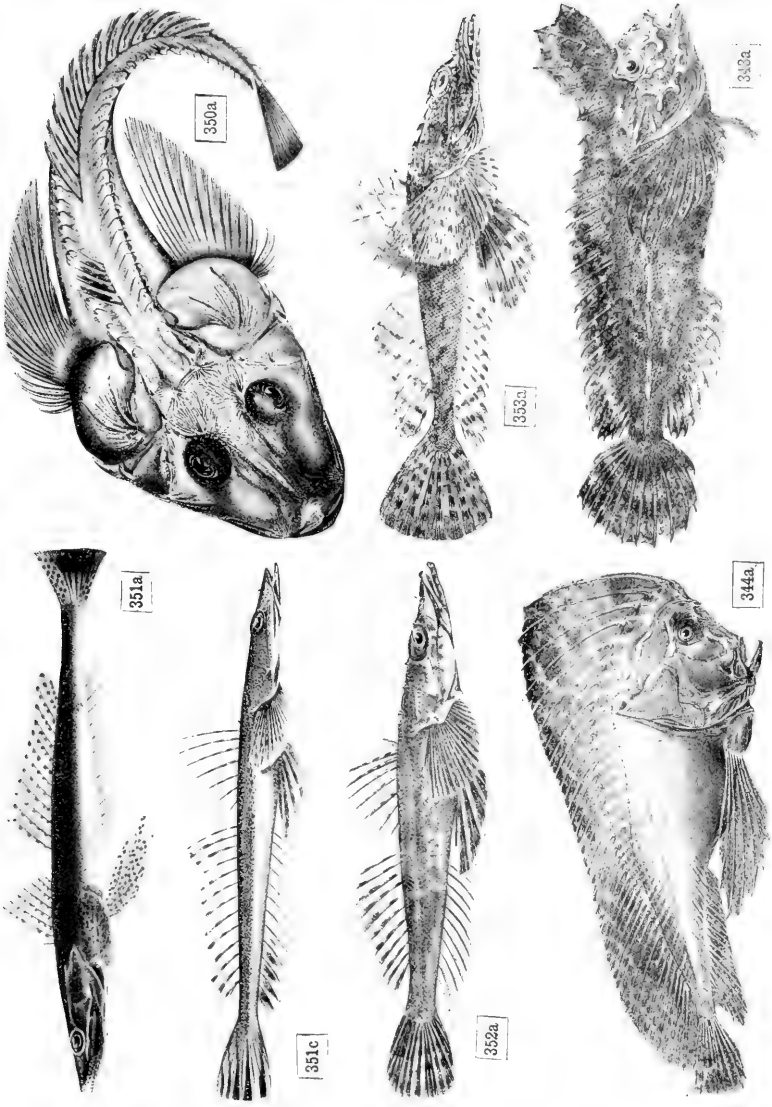

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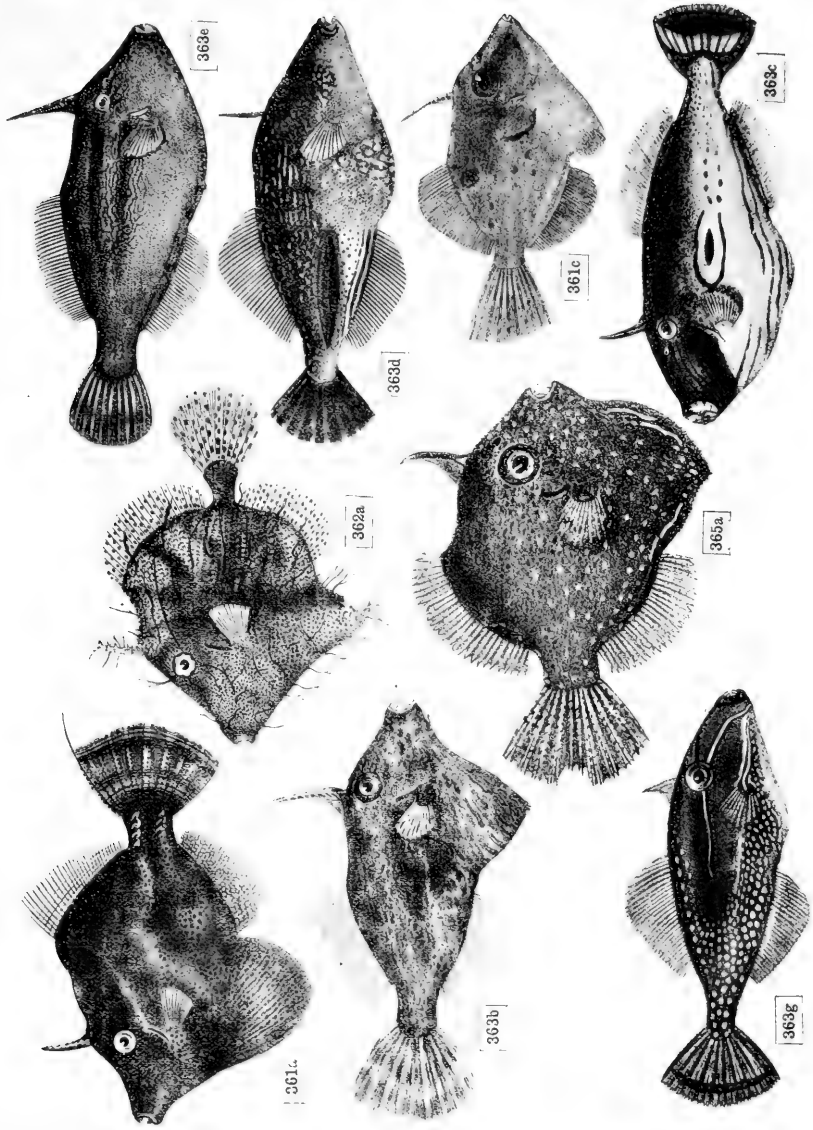

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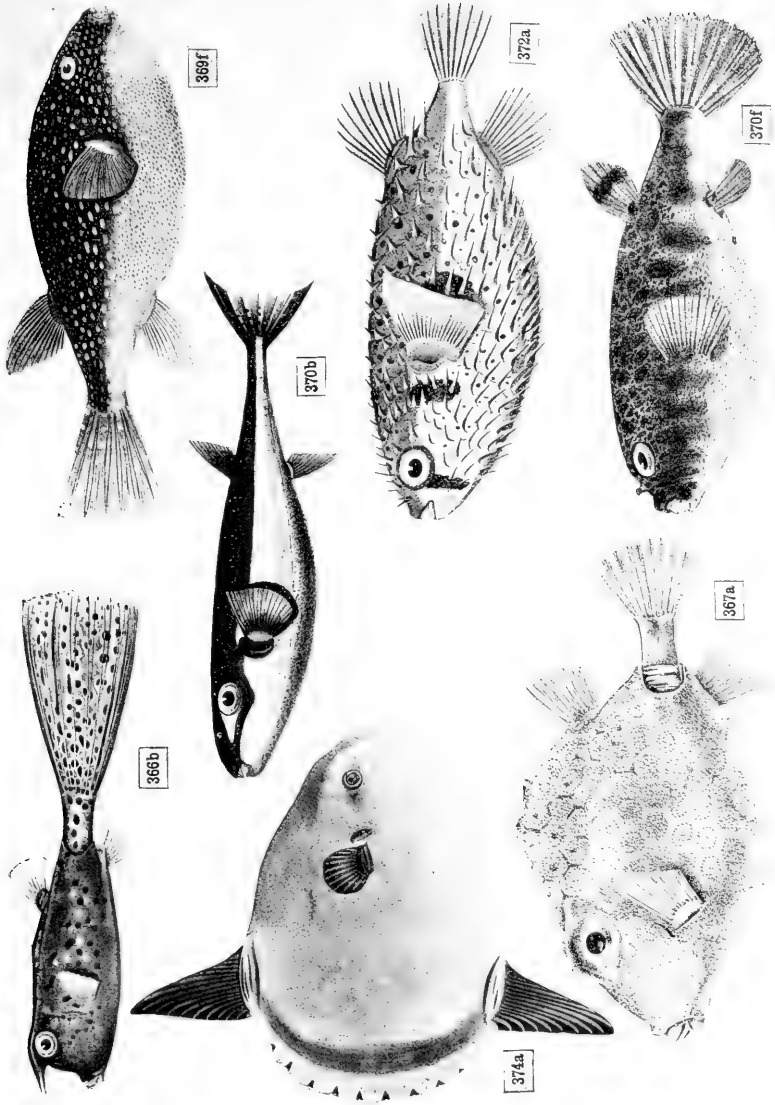

T. C. Roughley, Photo.

The Handbook Publication Fund

OF THE

Royal Zoological Society of New South Wales.

In his address, delivered at the Annual General Meeting of the Society in July, 1918, the then President (Mr. A. F. Basset Hull) referred to the want of cheap hand-books to the Fauna of Australia, and suggested that there were members of the Society capable of writing such hand-books, if funds to publish them could be provided by public-spirited benefactors.

In the following year it was announced that a special Handbook Publication Fund had been established, donations to the amount of £101 having been received.

In 1920 Sir George Kenrick, ex-Lord Mayor of Birmingham, England, and a keen collector of butterflies, was on a visit to Sydney. He expressed a wish to obtain a collection of Australian butterflies, and consulted Mr. G. A. Waterhouse, Honorary Treasurer of this Society, who, in conjunction with Mr. George Lyell, of Gisborne, Victoria, and Mr. G. M. Goldfinch, of Sydney, agreed to make up a representative collection provided that Sir George Kenrick made a contribution to the Society's Handbook Publication Fund. To this Sir George agreed, and fixed the contribution at £150.

From the moneys thus obtained, the cost of bringing out the first Handbook, "The Fishes of New South Wales," will be defrayed. All moneys realised by sales of this Handbook will be paid into the Fund, with the view of producing another Handbook.

Contributions to the Fund may be forwarded to the Honorary Secretary of the Society, Box 2399 General Post Office, Sydney, and will be duly acknowledged.

List of contributors to the Fund to 31st March, 1922.

Sir George Kenrick	£150	0	0	Kelso King	10	0	0
Walter & Eliza Hall Trust	50	0	0	Sir Hugh Dixson	5	0	0
Henry Luke White	10	10	0	George Judah Cohen ...	5	0	0
Thomas Phillips Austin .	10	10	0	Alfred Edmund Jaques .	3	19	0
Sir James Burns	10	0	0				
Charles Henry Hoskins ..	10	0	0		£264	19	0

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