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VOYAGE OF H.M.S. CHALLENGER.

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ZOOLOGY.

REPORT on the SHORE FISHES procured during the Voyage of H.M.S. Challenger in the Years 1873-1876. By ALBERT GÜNTHER, M.A., M.D., Ph.D., F.R.S., Keeper of the Department of Zoology in the British Museum.

THE collection of Fishes procured during the voyage of H.M.S. Challenger has been divided into two distinct series. The first consists of the specimens collected near the coast at the various localities at which the Expedition landed: they are littoral forms, to which a few obtained from fresh waters have been added. The second consists of the specimens obtained in the open sea, either from the surface or from the bottom; these are the Pelagic and Deep-sea forms.

The present part treats of the fishes of the first series only. Care has been taken to enumerate all the species collected, with a statement of the localities where they were captured; but descriptions of a part only are given—viz., of those which proved to be new or but imperfectly known. This series consists of 1400 specimens, representing 520 species, of which 94 are new to science; and, throughout, bears evidence of having been collected with judgment and discrimination; the specimens being carefully labelled, and, with but few exceptions, in an excellent state of preservation.

The opportunities of collecting shore fishes were dependent on many circumstances, and, consequently, the faunæ of the various localities are very unequally represented in this collection, as must needs be the case in all voyages of discovery.

Therefore it seemed to me far more useful to students of ichthyology, as well as to travellers, to arrange the materials geographically, than to follow a strictly systematic order. Indeed, in adopting this plan I have found a precedent in J. R. Forster's Descriptiones Animalium, which contains the zoological results of Cook's Voyage

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round the Globe in 1772-1774; to facilitate reference, however, to any particular species, I have added a separate systematic list of all the species collected.

The proportion of new species is larger than could have been anticipated, as most of the localities visited had been previously well searched by naturalists, and is much larger than is found in the majority of similar miscellaneous collections. The localities which yielded the most important results by the discovery not only of undescribed species, but also of those to which particular faunistic interest is attached, are, in the Atlantic, St Paul's Rocks, Ascension, and the mouth of the Plate River; in the Southern Ocean, Magellan Straits, Juan Fernandez, and Kerguelen Island; in the Pacific, Twofold Bay, the Arafura Sea, the Admiralty, Sandwich Islands, and Japan.

In accordance with the instructions received, a complete set of the series, including 661 specimens, especially the typical examples from which descriptions and figures have been taken, has been deposited in the British Museum.

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## I. THE FISH-FAUNA OF THE SHORES OF THE ATLANTIC.

## A. TEMPERATE ZONE OF THE NORTH ATLANTIC.

Some shore fishes were collected by the Expedition at Madeira, and at two of the Cape Verde Islands, viz., St Vincent and St Jago. The Expedition stayed at the former place from February 2 to February 6, and on July 9; at St Vincent from July 27 to August 5; and at St Jago from August 7 to August 9, 1873; and on the return voyage in 1876 at St Jago on April 16, and at St Vincent from April 18 to April 26. The species collected at these places are comparatively few in number, and none of them of special interest; so that their simple enumeration will suffice. The shore fauna of the temperate zone gradually merges into that of the tropical zone, so that, whilst the Madeira fishes are almost purely Mediterranean, those of the Cape Verde Islands show a great admixture of West Indian species.

A single more northern species, obtained south of Halifax, Nova Scotia, is included in this series.

- Anthias sacer*, Bl., Madeira.  
*Sebastes kuhli*, Bowd., Madeira.  
*Scorpaena scrofa*, L., St Vincent.  
*Rhypticus saponaceus*, Bl. Schn., St Vincent.  
*Beryx splendens*, Lowe, Madeira.  
*Dactylopterus volitans*, L., St Vincent.  
*Lichia glauca*, L., St Jago.  
*Caranx crumenophthalmus*, Bl., St Jago.  
*Argyriosus setipinnis*, Mitch., Porto Praya, St Jago.  
*Galeoides polydactylus*, Vahl., St Jago.  
*Sphyræna vulgaris*, C. V., St Jago.  
*Mugil cephalus*, Cuv., St Jago.  
*Blennius sanguinolentus*, Pall., St Vincent.  
*Lepadogaster gouani*, Barnev., St Vincent.  
*Scarus chrysopterus*, Bl., St Vincent.  
*Hippoglossoides dentatus*, Mitch., South of Nova Scotia. Station 49;  
83 fathoms.  
*Rhomboidichthys podas*, De la Roche, St Vincent.  
*Hemirhamphus vittatus*, Val., St Jago.  
*Balistes forcipatus*, Gm., St Vincent.  
*Monacanthus setifer*, Benn., St Vincent.

## B. TROPICAL ATLANTIC.

## 1. SURFACE FISHES COLLECTED AT ST PAUL'S ROCKS.

The Expedition landed on these craggy rocks of the Mid-Atlantic on August 27, 1873, and the ship remained moored to the rocks till the 29th. The sea round them is described as abounding in fish, as is usual at such isolated localities. The fauna is composed of West Indian forms, with some of the species hitherto found at Ascension and St Helena; and I have thought it instructive to enumerate them separately, although evidently many more species might have been collected during a longer stay. It is not surprising that a distinct, and apparently undescribed, species of the widely spread genus *Holocentrum* should prove to be peculiar to this isolated locality.

*Holocentrum sancti pauli*, n. sp. (Pl. I. fig. A).

D.  $\frac{11}{5}$ , A.  $\frac{4}{10}$ , L. lat. 48, L. transv.  $3\frac{1}{2}/8$ . The height of the body is two-fifths of the total length (without caudal), the length of the head one-third; the interspace between the eyes is 5 in the latter (opercular spine included). The length of the snout is equal to the diameter of the eye, which is one-fourth of the length of the head; the maxillary does not reach to the vertical from the centre of the eye. Operculum, with a strong and thick triangular spine, and with denticulations beneath; præopercular spine broad, flattened, and cleft, or bifurcate at its extremity; its length is contained  $3\frac{1}{2}$  times in that of the posterior edge of the præoperculum. The third and fourth dorsal spines are the longest, a little less than half the length of the head; soft dorsal rather elevated, more than half the height of the body; caudal deeply forked, the upper lobe much longer than the lower; third anal spine very strong, one-third of the height of the body. Ventral fins about three-fourths of the length of the head, terminating at a great distance from the anus; pectoral shorter than the ventrals. Uniform red. Length of specimen 16 inches.

*Caranx ascensionis*, Forst.

*Glyphidodon saxatilis*, L.

*Cossyphus rufus*, L.

*PlatyGLOSSUS cyanostigma*, C. V.

*Enchelycore nigricans*, Bonnat.

*Balistes buniva*, Lac.

2. SURFACE FISHES COLLECTED AT THE ISLAND OF ASCENSION.<sup>1</sup>

On the return journey (April 1876) the Expedition remained several days at this locality, so that the naturalists succeeded in obtaining a rather interesting series of its

<sup>1</sup> [Many of the fishes in this list were collected by Dr Drew, R.N., and sent home to Mr Murray after the Challenger left.—C. WY. T.]

surface fishes, adding to its fauna several forms which had escaped the notice of previous observers; the occurrence of *Blennophis webbi*, so far south, is a curious fact. Ascension, like St Helena, has several fishes which hitherto have not been found elsewhere; but their distinctive characteristics are merely specific, not generic.

*Carcharias obscurus*, Les.  
*Serranus impetiginosus*, M. and T.  
*Sargus argenteus*, C. V.  
*Holocentrum longipinne*, C. V.  
*Lichia glauca*, L.  
*Caranx ascensionis*, Forst.  
*Blennophis webbi*, Val.  
*Antennarius multiocellatus*, C. V.  
*Glyphidodon saxatilis*, L.

*Julis ascensionis*, Q. and G.,

In specimens 3 inches and 4 inches in length, the sides are of very light colour, and traversed longitudinally by a dark purplish band proceeding from behind the operculum, above the pectoral fin to the root of the caudal. Dorsal with a black spot between the first three spines; the rest of the fin greenish along its basal portion, and with a blackish intramarginal band, the tips of the rays being whitish (in spirits). Anal greenish, with a bright coloured longitudinal band; caudal uniform light yellowish. In a specimen 5½ inches long, there is a darker shade on the upper parts of the body, and no trace of the longitudinal band on the side; the coloration generally is much darker, and there is a vertical dark line on most of the scales; in other respects the coloration of the four specimens is similar.

*Belone trachura*, C. V.  
*Muraena moringa*, Cuv.  
*Monacanthus scriptus*, Osbeck.  
*Balistes vetula*, L.  
*Balistes buniva*, Lac.

### 3. ST THOMAS (WEST INDIES) AND THE COAST OF BRAZIL.

The naturalists of the Expedition had only a few opportunities of collecting shore fishes in this part of the Tropical Atlantic, viz., at St Thomas (March 24, 1873); off Pernambuco (September 10); and Bahia (September 14). Of these localities, the sea off Pernambuco, described in the List of Stations as No. 122, yielded some interesting novelties; the fishes were obtained by means of the trawl in depths varying from 32

to 400 fathoms, so that the exact depth could not be accurately ascertained for every species. However, as some of the species obtained on that occasion belong, or are closely allied, to well known genera of shore fishes, I have considered it safer to include these at least in the present series than to enumerate them among the deep-sea forms.

*Bathyanthias*, n. gen. (Percidæ).

Form of the body similar to that of *Anthias*. One dorsal fin with nine spines; anal with three; caudal truncated. Teeth in villiform bands, in the jaws, on the vomer and palatine bones, without canines. Tongue smooth. Præoperculum finely serrated, without projection. Scales of moderate size, very finely ciliated. Branchiostegals seven. Coast of Brazil.

*Bathyanthias roseus*, n. sp. (Pl. I. fig. B).

D.  $\frac{9}{14}$ , A.  $\frac{3}{8}$ , L. lat. 58, L. transv.  $\frac{2}{18}$ . The length of the head is nearly equal to the depth of the body, and one-third of the total length (without caudal). Eye as long as the snout, and two-sevenths of the length of the head; interorbital space flat, but much narrower than the orbit; maxillary extending to below the middle of the eye; the vomerine teeth form a triangular patch, the palatine bands being very narrow. Six series of scales on the cheek. Præoperculum very finely serrated on its posterior margin and with the angle rounded; operculum without spine. Caudal and anal fins scaly, but the soft dorsal scaleless. Dorsal spines rather feeble, the third being the longest, and about one-third of the length of the head; pectoral fin falciform, extending to the anal, and not quite so long as the head; ventrals only half as long. The lateral line ascends rapidly from its origin towards the spinous dorsal, and runs close to the upper profile, descending again behind the dorsal to the middle of the tail. Colour, uniform rose-coloured, with two faint lighter longitudinal bands. Length of specimen  $4\frac{1}{2}$  inches. Station 122; 30 or 350 fathoms.

*Centropristis annularis*, n. sp. (Pl. I. fig. C).

D.  $\frac{19}{12}$ , A.  $\frac{3}{7}$ , L. lat. 60. Margin of the præoperculum rounded, without stronger spines at the angle; operculum with three spines. Reddish, with two incomplete black rings behind the eye, with a large, saddle-shaped spot on the back of the trunk, and with some small black dots on the dorsal fin. Off Pernambuco. Length of specimen 2 inches. Station 122; 30 or 350 fathoms.

*Serranus apua*, Bl., St Thomas.

*Rhypticus arenatus*, C. V., Bahia.

*Mesoprion chrysurus*, Bl., St Thomas.

*Hæmulon chrysargyreum*, Gthr., Fernando Noronha.

*Priacanthus*, sp., Station 126.

*Pomacanthus paru*, Bl., St Thomas.

*Scorpæna plumieri*, Bl., St Thomas.

*Holocentrum longipinne*, C. V., St Thomas.

*Peristethus truncatum*, n. sp. (Pl. II. fig. A).

D.  $\frac{7}{19}$ , A. 20, L. lat. 32. The length of the præorbital processes is contained twice and three-fourths in the distance between their extremities and the anterior margin of the orbit. Interorbital space deeply concave, with a depressed smooth groove along the middle; a minute spine on the base of each præorbital process, but no other on the upper surface of the snout; lower jaw with numerous barbels, the longest being fringed. The præopercular ridge does not extend beyond the hind margin of the bone, and is not produced into a spine; also the opercular ridge terminates in a short and truncated projection. Each scute of the body with a hooked spine. Each of the bony plates between the ventral fins is not quite twice as long as broad. Rose-coloured, with small irregular brownish spots on the upper parts. Length of specimen  $6\frac{1}{2}$  inches. Coast of Pernambuco. Station 122; 30 or 350 fathoms.

*Malthe vespertilio*, L. Station 122; 30 or 350 fathoms.

*Heliastes flavicauda*, n. sp. (Pl. XXX. fig. D).

D.  $\frac{13}{12}$ , A.  $\frac{2}{11}$ , L. lat. 27, L. transv.  $2\frac{1}{2}/9$ . The height of the body is contained twice and one-third in the total length (without caudal); the diameter of the eye is a little more than one-third of the length of the head or than the width of the interorbital space. Dorsal spines of moderate strength and nearly equal in length; the length of the second anal spine is one-half of that of the head; caudal fin emarginate, with the lobes rounded. Sky-blue (in spirits) with purple reflexions; abdomen purplish; end of the tail and caudal fin yellow; a deep black spot superiorly on the axil of the pectoral. Length of specimen 3 inches. Coast of Pernambuco. Station 122; 30 fathoms.

*Romboidichthys cornutus*, n. sp. (Pl. II. fig. B).

D. 78, A. 62, L. lat. 48. This species differs from all the other species of the genus in having the lateral line anteriorly with a very slight obliquity only; there is no curve. The height of the body is one-half of the total length (without caudal), the length of the head a little less than one-third. Head higher than long, with the anterior profile straight; snout only half as long as the large eye, the diameter of which is two-fifths of the length of the head. Cleft of the mouth of moderate width; the maxillary extending beyond the front margin of the eye, which it equals in length. Interorbital space concave, scaly, its width being one-half of the longitudinal diameter of the eye. Lower

eye a little in advance of the upper. Snout with three pointed projections in front of the upper eye (at least in the adult). None of the fin rays produced. Pectoral of the coloured side as long as the head, without snout. A series of distant large blackish spots along the basal half of the dorsal and anal fins; one or two similar spots on the basal half of the caudal, and on the terminal portion of the tail. Pectoral with two or three blackish transverse bands. In two very young specimens which appear to belong to the same species the eyes are very close together, and there are no tentacles on the snout. Length of specimen  $1\frac{2}{3}$  to  $3\frac{1}{2}$  inches. Coast of Brazil. Station 122; 30 or 350 fathoms.

*Hippocampus guttulatus*, Cuv. Station 122; 30 or 350 fathoms.

*Hippocampus villosus*, n. sp. (Pl. I. fig. D).

Dorsal fin with sixteen rays. Tubercles well developed, rather pointed, the most prominent provided with bundles of filaments; the whole upper surface, and especially the top of the trunk, covered with similar filaments; supraorbital spine slightly truncated, and with its anterior portion slightly detached; coronet of moderate height; the length of the snout is equal to the distance between the centre of the orbit and the gill-opening. Uniform light coloured. Length of specimen  $2\frac{1}{4}$  inches. Off Bahia, in 7 to 20 fathoms. The figure represents the specimen twice its natural size.

*Monacanthus occidentalis*, Gthr. Station 122; 30 or 350 fathoms.

*Ostracion quadricornis*, L. Station 122; 30 or 350 fathoms.

#### 4. BERMUDA.

The marine fish fauna of Bermuda does not exhibit any peculiarity, by which it may be distinguished from that of the tropical Atlantic generally. No naturalist has paid more attention to it than Mr J. Matthew Jones, who has collected the fishes round this island for many years, and who has recently succeeded in obtaining several which hitherto had escaped observation. Mr G. Brown Goode has published (1876) a Catalogue of the Fishes of Bermuda, based chiefly upon the collections of the United States National Museum. Probably in the course of years all the species found round the West Indian Islands will be found to occur, at least occasionally, near Bermuda.

In the following list those recently observed by Mr Jones are enumerated with those collected by the naturalists of the Challenger:—

*Carcharias obscurus.*

*Mustelus lævis.*

*Ætobatis narinari.*

*Holocentrum longipinne.*

*Serranus undulosus.*

*Serranus coronatus.*

*Rhypticus saponaceus.*

*Mesoprion chrysurus.*

<i>Apogon imberbis.</i>	<i>Glyphidodon caelestinus.</i>
<i>Priacanthus macrophthalmus.</i>	<i>PlatyGLOSSUS bivittatus.</i>
<i>Hæmulon xanthopteron.</i>	<i>Scarus catesbyi.</i>
<i>Hæmulon macrostoma.</i>	<i>Pseudoscarus psittacus.</i>
<i>Gerres lefroyi.</i>	<i>Pseudoscarus sanctæ crucis.</i>
<i>Gerres gula.</i>	<i>Brotula barbata.</i>
<i>Gerres jonesi.</i>	<i>Hemirhombus soleæformis.</i>
<i>Sargus capensis.</i>	<i>Rhomboidichthys lunatus.</i>
<i>Sargus argenteus.</i>	<i>Saurus myops.</i>
<i>Pimblepterus bosci.</i>	<i>Saurus intermedius.</i>
<i>Chætodon capistratus.</i>	<i>Saurus fatens.</i>
<i>Holacanthus tricolor.</i>	<i>Fundulus bermudæ.</i>
<i>Scorpæna plumieri.</i>	<i>Belone hians.</i>
<i>Caranx caballus.</i>	<i>Belone jonesi.</i>
<i>Caranx dentex.</i>	<i>Exocætus lineatus.</i>
<i>Caranx carangus.</i>	<i>Exocætus furcatus.</i>
<i>Caranx chrysos.</i>	<i>Albula conorhynchus.</i>
<i>Trachynotus ovatus.</i>	<i>Engraulis chærostomus.</i>
<i>Trachynotus goreensis.</i>	<i>Clupea macrophthalma.</i>
<i>Acanthurus chirurgus.</i>	<i>Clupea thrissa.</i>
<i>Thynnus thunnina.</i>	<i>Ophichthys acuminatus.</i>
<i>Coryphæna pelagica.</i>	<i>Myrophis punctatus.</i>
<i>Coryphæna hippurus.</i>	<i>Muræna miliaris.</i>
<i>Nomeus gronovii.</i>	<i>Muræna maculipinnis.</i>
<i>Thyrsites prometheus.</i>	<i>Muræna sanctæ helenæ.</i>
<i>Sphyræna picuda.</i>	<i>Syngnathus pelagicus.</i>
<i>Mugil brasiliensis.</i>	<i>Syngnathus jonesi.</i>
<i>Malacanthus plumieri.</i>	<i>Diodon maculatus.</i>
<i>Gobius soporator.</i>	<i>Tetrodon rostratus.</i>
<i>Blennius crinitus.</i>	<i>Tetrodon spengleri.</i>
<i>Salarias vomerinus.</i>	<i>Ostracion triqueter.</i>
<i>Regalecus gladius.</i>	<i>Ostracion trigonus.</i>
<i>Fistularia serrata.</i>	<i>Balistes maculatus.</i>
<i>Aulostoma coloratum.</i>	<i>Monacanthus aurantiacus.</i>
<i>Pomacentrus rectifrenum.</i>	

*Gerres lefroyi*, Goode, Bermuda.

*Diapterus lefroyi*, G. Brown Goode, Am. Jour. Sc. and Arts, 1874, p. 123; Bull. U. S. Nat. Mus. No. 5, 1876, p. 39.

*Gerres productus*, Poey, Ann. Lyc. N. York, 1876, vol. xi. p. 59; O'Shaughnessy, Zool. Rec., 1877, vol. xiii. Pisc. p. 12.

*Gerres jonesi*, Gthr. (Ann. and Mag. Nat. Hist., 1879, vol. iii. pp. 150, 389).

D.  $\frac{9}{10}$ , A.  $\frac{3}{7}$ , L. lat. 49, L. transv.  $5\frac{1}{2}/10$ . The height of the body is two-sevenths of the total length (without caudal). Præorbital and præoperculum entire, the latter with the angle slightly rounded. The groove for the processes of the intermaxillaries does not extend to the vertical from the centre of the eye, is elongate, and entirely free from scales. The snout is as long as the eye, and equals the width of the interorbital space. The spines of the fins are slender, the second of the dorsal slightly exceeding half the length of the head, and being more than twice as long as the second of the anal fin, which is stoutish and shorter than the eye. Uniform silvery, from 6 to 9 inches long.

*Sargus capensis*, Smith, Bermuda.

*Pimelepterus bosci*, Lac., Bermuda.

*Caranx caballus*, Gthr., Panama, Bermuda.

*Trachurus boops*, Girard, U. S. Pac. R. R. Route, Fish., p. 108.

*Caranx caballus*, Gthr., Zool. Trans., vol. vi. p. 431.

This species is new to the West Indian fauna.

*Fundulus bermudæ*, Gthr. (Ann. and Mag. Nat. Hist., 1874, vol. xiv. p. 370), (Pl. XXXII. fig. B).

D. 14, A. 12, L. lat. 35, L. transv. 13. The height of the body is one-fourth of the total length (without caudal), the length of the head rather less than two-sevenths. Snout short, not longer than the eye, with the lower jaw ascending and projecting beyond the upper. The width of the interorbital space is contained twice and one-third in the length of the head, the diameter of the eye four times. The origin of the dorsal fin is opposite to the sixteenth scale of the lateral line, and midway between the root of the caudal and the præopercular margin. The first anal ray corresponds to the fourth or fifth of the dorsal fin. Anal fin much higher than long. Brownish-olive, with numerous indistinct dark greenish cross bands (in the male).

Of this species, of which the original specimen was sent by J. Matthew Jones, Esq., the Challenger collection contains a second.  $2\frac{3}{4}$  inches in length. Brackish water, Bermuda.

*Belone jonesi*, Goode (Goode, Amer. Journ., April 1879, p. 340; Gthr., Ann. and Mag. Nat. Hist., 1879, vol. iii. pp. 151, 390).

D. 25, A. 22. The free portion of the tail is rather depressed, somewhat broader



than deep, the lateral line terminating in a black-coloured keel. The length of the head is less than one-third of the total (without caudal); its upper surface is broad, flat, striated; frontal bones diverging behind, leaving a broad space between them which is covered by skin; this space tapers in front, and is closed between the orbits. Maxillary entirely hidden by the præorbital. Jaws and teeth strong; vomerine teeth none; tongue rough. The diameter of the eye is two-thirds of the width of the interorbital space, and two-fifths of the length of the postorbital portion of the head. Body stout, not much compressed. Pectoral fin as long as the postorbital portion of the head. Ventral fin midway between the root of the caudal and the eye. The middle and hinder dorsal and anal rays subequal in length, short, the last terminating at a considerable distance from the root of the caudal. Caudal fin deeply lobed. Scales very small, irregular, and adherent. A single specimen, 3 feet long.

*Syngnathus pelagicus*, Osbeck. Gulf weed, South of Bermuda.

### C. TEMPERATE ZONE OF THE SOUTH ATLANTIC.

#### 1. MOUTH OF THE RIO DE LA PLATA.

The fishes of this river, as well as of the shores near its mouth, are very incompletely known, more so than those of the southernmost extremity of the Continent. Therefore, we may well expect considerable additions to be made by future explorers of this fauna; one-half of the species collected by the Challenger Expedition at this locality, on its homeward journey (February 25 and 26, 1876), have proved to be undescribed.

*Raja platana*, n. sp. (Pl. III.).

Snout long, produced, pointed, the width of the interorbital space being a little more than one-third of the distance of the eye from the end of the snout. The anterior profile (from the snout to the angle of the pectoral fin) is undulated. Width of the interorbital space less than the length of the eye and spiracle together. Mouth strongly curved. Teeth pointed, in about forty-eight series in the upper jaw. Distance between the nostril and the angle of the mouth two-thirds of the inter-nasal space. The outer pectoral angle is a right one. Distance between the two dorsal fins rather more than the length of the base of the first. Bands of minute asperities along each side of the snout, and along each superciliary edge. The remainder of the upper side is smooth, with the exception of the claw-like spines on the pectoral fin which are peculiar to the male sex. A series of small spines along the median line of the tail. Lower parts with large black pores symmetrically arranged. Upper parts uniform brownish, lower whitish.

Distance from the vent to the extremity of the snout,  $13\frac{1}{2}$  inches; distance from the vent to the extremity of the tail,  $11\frac{1}{2}$  inches; greatest width of the disk, 21 inches.

A single adult specimen has been obtained. 25 inches in length. Station 321. Riode la Plata; 13 fathoms.

*Raja microps*, n. sp. (Pl. IV.,  $\frac{2}{3}$  natural size).

A short-snouted species. The angle formed by the margins of the snout is obtuse, and the extremity does not project. The width of the interorbital space is much more than the length of the orbit together with the spiracle, and is contained twice and two-thirds in the distance between the eye and the end of the snout. Mouth very slightly curved; teeth obtuse, in about forty series in the upper jaw. The outer pectoral angle is rounded, but the margins would meet at a right angle. The two dorsal fins close together, separated by a spine only. Minute roughnesses on the snout, the interorbital space, along the median line of the back, and along the front margin of the pectoral fin. A single spine in the middle of the back, and a series of spines along the median line of the tail. The muciferous tubes behind the head are very conspicuous, and arranged like a fan on each side of the occiput; each opens by a pore. Uniform brown above, white below.

Distance of the vent from the extremity of the snout,  $7\frac{1}{4}$  inches; distance of the vent from the extremity of the tail,  $8\frac{1}{2}$  inches; width of the disk, 11 inches. Length of specimen,  $15\frac{3}{4}$  inches.

The single specimen examined is a young male.

Rio de la Plata. Station 321; 13 fathoms.

An adult female (disk, 23 inches wide) received lately by the British Museum, from Buenos Ayres, has a single curved spine, with a broad base on each side, near the front margin, on a level with the spiracles.

*Ancylodon atricauda*, n. sp.

D.  $\frac{8}{31}$ , A. 12. The height of the body is somewhat less than the length of the head, which is one-third of the total (without caudal). Eye of moderate size, equal to the width of the interorbital space, and shorter than the snout. The maxillary does not extend to the posterior margin of the eye. Lower jaw projecting beyond the upper, the mandibular teeth being outside the upper lip. The canine teeth are comparatively smaller than in *Ancylodon jaculidens*. Vertical fins scaly. The middle caudal rays prolonged into a narrow pointed lobe. Scales small, silvery, with the caudal lobe black. Length of specimen, 5 inches. Mouth of the Rio de la Plata. Station 321; 13 fathoms

*Otolithus guatucupa*, C. V. Station 321; 13 fathoms.

*Micropogon ornatus*, n. sp. (Pl. VII. fig. A).

D.  $9\frac{1}{32}$ , A.  $\frac{2}{8}$ , L. lat. 63. The height of the body is one-third of the total length (without caudal), the length of the head one-fourth. Dorsal profile very concave on the neck. Diameter of the eye two-thirds of the length of the snout, two-elevenths of that of the head, and rather more than one-half of the width of the interorbital space. A series of small barbels from the interoperculum to the lower lip, where they are most crowded. Præoperculum without spines at the angle. Dorsal and anal spines very feeble. Pectoral as long as the head. There are eight or nine scales in a transverse series between the first dorsal and the lateral line. A large, round, black spot at the origin of the lateral line. Body with six alternately broad and narrow blackish cross-bands. Pectoral blackish along the middle. Length of specimen,  $8\frac{3}{4}$  inches. Mouth of the Rio de la Plata. Station 321; 13 fathoms.

*Micropogon undulatus*, L., Monte Video.

*Percophis brasilianus*, Q. and G. Station 322; 21 fathoms.

*Prionotus punctatus*, Bl. Station 322; 21 fathoms.

*Læmonema longifilis*, n. sp. (Pl. VII. fig. B).

D.  $\frac{6}{5}$ , A. 45. Head, and particularly the snout, depressed; the latter with the upper jaw much projecting, not quite twice as long as the eye, the diameter of which is nearly one-sixth of the length of the head. The head is one-fourth of the total length (without caudal). Cleft of the mouth rather wide, the maxillary not quite extending to the hind margin of the eye. Teeth of the jaws in villiform bands; vomer, with two groups of teeth, separated in the middle by a toothless interspace. Barbel about as long as the eye. Interorbital space wider than the eye. Operculum without spine. Scales very small. Fins naked. The first dorsal commences above the root of the pectoral, and is narrow and high, the third ray being prolonged into a long filament. The second dorsal rather high, but lower than the body. Caudal rounded. Pectoral nearly as long as the head, without snout. Ventral reduced to a bifid filament, the lower ray being much longer than the upper, almost half as long as the body. Body brownish; the dorsal filament, the outer margins of the vertical fins, and the long ventral filament black. Length of specimen,  $7\frac{1}{2}$  inches. Mouth of the Rio de la Plata. Station 321; 13 fathoms.

*Aphoristia ornata*, Lac. Station 321.

*Arius commersoni*, Lac., Monte Video.

*Engraulis olida*, Gthr. Station 321.

## 2. CAPE OF GOOD HOPE.

The few fishes collected at the Cape do not offer any particular interest.

(a.) *Marine Species.*

*Chorisochismus dentex*, Pall., Simon's Bay.

*Tetrodon honckenii*, Bl., Cape of Good Hope (the poison-fish of Simon's Bay).

*Bdellostoma cirrhatum*, Forst., Simon's Bay.

(b.) *Fresh-water Species.*

*Spirobranchus capensis*, C.V., Rivers at Wellington and Cape Town.

*Barbus afer*, Ptrs., Rivers at Wellington and Cape Town.

*Barbus*, sp. (?), in bad state; River at Cape Town.

## II. THE FISH-FAUNA OF THE ANTARCTIC OCEAN AND OF SHORES ABUTTING ON IT.

The study of the Antarctic surface fish-fauna, and its comparison with that of the Arctic Regions, is one of the most instructive portions of zoogeography. The abundance of fish-life appears to decrease in the same proportion towards both Poles. The forms peculiar to the Antarctic are analogous to those of the North; thus the Cottoids of the North are represented by the *Nototheniæ*, *Chænichthys*, &c., of the South, the Salmonoids by the *Haplochitonidæ*; yet there is no such relation between the representative forms as might be considered to be genetic. The resemblance is rather an external one, indicated by the general form of the body, structure and development of the fins, presence of an adipose fin, &c. Beside those fishes which are peculiar to the Antarctic, some other forms well developed in the North, but nearly or entirely disappearing between the Tropics, reappear, as *Sebastes*, *Agonus*, *Spinax*, *Myxine*, differing but little from their northern congeners.

The Expedition obtained the fishes belonging to this fauna at two points.

### A. KERGUELEN ISLAND AND PRINCE EDWARD'S ISLAND.

Except a flat fish from Prince Edward's Island, the specimens were collected on the north-eastern side of Kerguelen Island, between the 7th and 31st of January 1874. Nearly all we know of the fishes of this island is due to the Naturalists of the Antarctic Expedition under Captain Ross, and to those of the "Transit of Venus" and Challenger Expeditions. The number of species known is very small, the following three only having been described, besides those obtained on the present Expedition:—

*Notothenia coriiceps*, Richards (Voy. "Erebus" and "Terror").

*Notothenia purpuriceps*, Richards (Voy. "Erebus" and "Terror").

*Notothenia antarctica*, Peters (Berl. MB., 1876, p. 837).

*Raja eatoni*, Gthr. (Phil. Trans., vol. clxviii. p. 166).

Of this species a female has been found by the naturalists of the Challenger. It differs very little from the male found by Mr Eaton; but, of course, the claw-like spines on the pectoral fin are absent. The lower part of the body is entirely white, that of the tail blackish.

*Raja murrayi*, n. sp. (Pl. V.).

The angle formed by the margins of the snout slightly obtuse, with the extremity somewhat projecting. The width of the interorbital space equals the length of the orbit. The distance between the outer margins of the nostrils is rather less than their distance from the extremity of the snout. Teeth pointed in both sexes, more so in the male than in the female. Outer pectoral angle obtusely rounded. A curved spine in front and behind on the superciliary edge. From four to six similar spines placed in a triangle in the middle of the back. Tail with a median series of from sixteen to eighteen spines, but with only very small ones on the sides. The spines, as far as described at present, are found in both sexes, in the old as well as in the young. In the male the greater part of the upper side of the body is smooth, with the usual patch of recurved spines near the pectoral angle. In the female the whole of the upper surface is covered with scattered small stellate asperities, which, in young specimens, are still more numerous than in the old. The caudal series of spines is, in the young, generally continued forward to the dorsal spines. Upper parts brown, with rounded darker and lighter spots. A large yellowish ocellus edged with blackish on each side of the back of the male.

Two adults (male and female) and three young specimens were collected. The former are  $17\frac{1}{2}$  inches long, the tail measuring 9 inches. The greatest width of the disk is 11 inches. Kerguelen Island.

*Zanclorhynchus*, n. gen. (Scorpenidae).

Body compressed, oblong, without scales, covered with minute asperities. Bones of the head armed with spines; præorbital not armed. Snout pointed; mouth very protractile, lateral, narrow, toothless. Two dorsal fins. Ventral far behind the pectoral, the pubic bones being much prolonged. Gill-opening reduced to a narrow slit above the root of the pectoral.

*Zanclorhynchus spinifer*, n. sp. (Pl. VIII. fig. A).

D.  $1\frac{9}{2}$ , A. 10, P. 9, V.  $\frac{1}{5}$ . The height of the body is somewhat less than the length of

the head, which is one-third of the total (without caudal). A great part of the surface of the head is bony. Spines are developed, (1) above the nostril, (2) above the hinder half of the eye, (3) above the præoperculum, (4) on the suprascapula, (5) below the hinder half of the orbit, (6) on the humerus, above the base of the pectoral. Of these spines the second, fourth, and fifth are the strongest. Eye large, two-sevenths of the head, and rather shorter than the snout.

The dorsal fin commences on the neck with a short spine. All its spines are strong, the third being the longest, as high as the body. The soft dorsal is well separated from, and lower than, the spinous. Caudal subtruncated. Pectoral with narrow base, somewhat shorter than the head. Ventral inserted midway between the vent and root of the pectoral, extending beyond the vent, and with the spine two-thirds as long as the longest ray. All the soft rays of the fins are simple. Body and vertical fins yellowish, broadly marbled with black. Length of specimen,  $3\frac{1}{2}$  inches. Kerguelen Island (in trawl).

*Chænichthys rhinoceratus*, Rich., Kerguelen.

*Notothenia cyaneobrancha*, Richards (Voy. "Erebus" and "Terror," Fish., p. 7, pl. iv.; Gthr., Fish., vol. ii. p. 261). Obtained by dredge.

*Notothenia mizops*, n. sp. (Pl. VIII. fig. D).

D. 4-5/35, A. 34, L. lat. 60. The length of the head is one-fourth of the total (without caudal); the height of the body two-ninths. The crown of the head is covered with minute scales to between the eyes, the snout and præorbital being scaleless. Eye large, one-third of the length of the head in young specimens, and two-sevenths in adults. Interorbital space extremely narrow; operculum with a short spine behind. Ventral long, extending sometimes as far back as the fourth anal ray. Body with two series of large irregular partly confluent blackish spots; cheek with two oblique streaks. First dorsal with a black spot. Vertical fins with bands of blackish dots, oblique on the dorsal and anal, and transverse on the caudal.

This species is distinguished from all its congeners from Kerguelen Island by having an eye of the same large size as *Notothenia squamifrons*. Length of specimens,  $1\frac{1}{2}$  to 6 inches. Off Christmas Harbour, and Howes Foreland; 120 fathoms.

*Notothenia squamifrons*, n. sp. (Pl. VIII. fig. C).

D. 5/35, A. 32, L. lat. 70. The length of the head is two-sevenths of the total (without caudal); the height of the body two-ninths. The upper surface of the head to the foremost part of the snout and the præorbital are entirely covered with scales, but in the smaller specimen the scales on the præorbital are less distinct than in the adult. Eye large, two-sevenths of the length of the head; interorbital space flat, scaly, rather narrow,

one-half of the vertical diameter of the eye. Ventral long, extending to the third or fourth anal ray. Body with irregular broad brown transverse bands; cheek with two oblique streaks. First dorsal nearly entirely black; caudal immaculate. This species is distinguished from *Notothenia tessellata* by the much greater size of its eye. Length of specimens, 4 to 6 inches. Kerguelen Island. Obtained by the dredge.

*Notothenia acuta*, n. sp.

D. 6/31, A. 30, L. lat. ca. 75. Head low, elongate, with pointed snout, its length being two-sevenths of the total (without caudal); the height of the body one-sixth. Head covered above with small scales nearly to the nostrils, the snout and præorbital being scaleless. Eye large, two-sevenths of the length of the head; interorbital space extremely narrow. Ventral extending to vent. Head and body marbled with blackish; cheek without streaks. Dorsal rays with blackish dots; caudal with cross-bands of blackish spots; anal white. Length of specimen, 2½ inches. Kerguelen Island. Obtained in trawl.

*Notothenia marionensis*, n. sp.

D. 7/29, A. 25, L. lat. 50. Head rather low, with pointed snout, its length being two-sevenths of the total (without caudal); the height of the body is two-elevenths of the same. Scales strongly ctenoid. Head covered above with small scales nearly to the nostrils; the snout, the præorbital, and the lower half of the cheek and operculum being naked. Eye of moderate size, equal to the length of the snout, and a little more than one-fourth of the length of the head; interorbital space narrow. Ventral not extending to the vent; pectoral reaching the third or fourth anal ray. Upper parts greenish, with subtessellated blackish spots along the side of the body; fins indistinctly dotted with greyish, a blackish spot at the base of the upper pectoral rays. Length of specimen, 3½ inches. Marion Island; 50 to 75 fathoms.

*Harpagifer bispinis*, Forst. Off Marion Island; 50 to 75 fathoms.

This species occurs also at Kerguelen Island, Cape Horn, and Falkland Islands.

*Murænolepis*, n. gen. (Gadidæ).

Body compressed, elongate, covered with epidermoid productions which are lanceolate, intersecting each other at right angles, like those of a fresh-water eel. Vertical fins confluent, no caudal fin being discernible; an anterior dorsal fin is represented by a single filamentous ray; ventral fins narrow, composed of several rays. A barbel. Jaws with a band of villiform teeth; palate toothless. Gill-openings rather narrow, extending from the lower part of the root of the pectoral round the isthmus, the gill-membranes

being confluent and not attached to the isthmus. Gills four. Air-bladder in the posterior half of the abdominal cavity, with a pneumatic duct, with rather stiff walls, and glandular internal surface. Peritoneum deep black. Kerguelen Island.

*Muraenolepis marmoratus*, n. sp. (Pl. VIII. fig. B).

Body compressed, its height equals the length of the head, and is contained five and a half to five and three-quarter times in the total length. Head compressed like the body, higher than broad, its greatest width being three-fifths of its length. Interorbital space slightly convex, equal in width to the diameter of the eye, which is rather less than one-fourth of the length of the head. Snout obtuse, rounded, as long as the eye, the upper jaw overlapping the lower. Cleft of the mouth rather oblique, the maxillary extending to the vertical from the centre of the eye. Barbel shorter than the eye. No teeth on the vomer. Nostrils immediately before the eye. Operculum rounded, without point. Branchiostegals five, the second with a process anteriorly at its root, directed downwards. Dorsal filament as long as the eye. Vertical fins continuous, of uniform height, and enveloped in a membrane on to which the epidermoid productions extend; the dorsal filament is just above the root of the pectoral, immediately before the commencement of the fin. Pectoral rounded, longer than the postorbital portion of the head. Ventral fins narrow, composed of five rays, the two outer ones much the thickest, and produced into filaments, the second ray being the longest, and about two-thirds the length of the head. The distance of the vent from the head exceeds the length of the latter. Reddish, finely marbled with brown; fins of a lighter colour and with a transparent margin. Length of specimen,  $3\frac{1}{4}$  and 6 inches.

*Lepidopsetta*, n. gen. (Pleuronectidæ).

Mouth rather narrow; jaws and dentition very feeble, but nearly equally developed on both sides. Eyes well developed, on the left side, the lower somewhat in advance of the upper. The dorsal fin commences in front of the eye. Pectorals none, or quite rudimentary. Lateral line single, straight. Scales very small. The entire head, and even the eyelids, are covered with minute scales.

*Lepidopsetta maculata*, n. sp. (Pl. XXX. fig. C).

D. 118, A. 98. The height of the body is contained twice and one-sixth in the total length (without caudal), the length of the head thrice and two-thirds. The eyes are large, one-third of the length of the head. The feeble maxillary extends to below the front margin of the eye. Teeth minute, apparently in a single series. Scales strongly ctenoid on both sides of the body. All the fin-rays are scaly. Dorsal and anal fins low. Pectoral entirely absent on the blind side, and represented by a small rudi-



ment only on the coloured; ventrals separate from each other and from the anal fin. Brown, body and fins covered with rounded irregular darker spots. Length of specimen,  $5\frac{1}{4}$  inches. Off Prince Edward's Island. Station 145; 310 fathoms.

#### B. MAGELLAN STRAITS AND FALKLAND ISLANDS.

The Fish-Fauna of Magellan Straits, to which must be joined that of the Falkland Islands and of the littoral archipelago on the western side of the extremity of the South American continent, bears a thoroughly antarctic character, closely resembling that of Kerguelen Island. Although it has been well worked as lately as the year 1867 by Dr R. O. Cunningham in his "Notes on the Natural History of the Strait of Magellan," it is still very far from being completely known, as may be seen from the large proportion of novel forms discovered by the Naturalists of the Challenger Expedition, who dredged at thirteen stations (Stations 304 to 316), between December 31, 1875, and February 3, 1876.

##### *Scyllium chilense*, Guich.

Having examined some specimens preserved in spirits in the Challenger collection, I am able to correct two errors in my former description, which was drawn up from dried specimens. The nasal valve is provided with a cirrus which, however, does not extend to the lip; and the teeth of the lower jaw have more or less distinct lateral cusps. Gray's Harbour, Messier Channel.

##### *Spinax granulatus*, n. sp. (Pl. II. fig. C).

This species is distinguished especially by the structure of its skin, which is finely granulated, the granules being serially arranged on the tail, where they appear rather in the form of minute spinelets than in that of granules. The space between the nostrils and the median line of the lower side of the snout, the circumference of the mouth, the base of the fins, and the back of the tail, are naked. The snout is much produced, the symphysis of the lower jaw being midway between the end of the snout and the root of the pectoral; snout very obtuse in front, with the front nostril opening forward. The first dorsal fin shorter than the second, midway between the second and the spiracle. Second dorsal spine three times the size of the first, not much lower than the fin. The length of the base of the second dorsal is one-third of the distance between the two fins. Pectoral truncated behind, extending backwards nearly to the first dorsal. Ventral extending to below the middle of the second dorsal. Black; hind margins of all the fins white. South-west coast of South America. Length of specimen (male),  $10\frac{1}{2}$  inches. Station 305; 120 fathoms.

*Raja brachyura*, n. sp. (Pl. VI.).

A short-snouted species. The angle formed by the margins of the snout is slightly obtuse, and the extremity does not project. The width of the interorbital space is more than the length of the orbit together with the spiracle, and but little less than one-half of the distance between the eye and the end of the snout. Mouth nearly transverse. Teeth pointed, in about thirty-five series in the upper jaw. Tail remarkably short and stout. The outer pectoral angle is rounded, and the margins would meet at an obtuse angle. The two dorsal fins are very close together. The upper part of the head and of the pectoral, and the back are covered with minute spines. A series of conical spines along the median line of the back and tail, the spines on the back being smaller and less constant than those on the tail. Brown, marbled with darker and lighter.

	Male.	Female.
Distance of the vent from the extremity of the snout, . . . . .	14 $\frac{1}{2}$ inches.	18 inches.
Distance of the vent from the extremity of the tail, . . . . .	12 $\frac{3}{4}$ „	14 $\frac{1}{2}$ „
Width of the disk, . . . . .	18 $\frac{1}{2}$ „	25 „
Total Length, . . . . .	27 $\frac{1}{4}$ „	32 $\frac{1}{2}$ „

Magellan Straits and west of them. Station 313; 55 fathoms. Station 314; 70 fathoms.

*Psammobatis rudis*, Gthr. (Pl. X.).

(?) *Raja scobina*, Phil. Wieg. Arch., 1857, p. 270.

This species, described by me from a very young example, attains a much more considerable size, a male, 11 $\frac{1}{2}$  inches long, being still far from being mature. With age the disk ceases to be as perfectly circular as is observed in young specimens, its anterior margins becoming more rectilinear. A very short and thin rostral appendage in front of the disk is present in all examples. Beside the median series of small thorns on the tail of very young examples, there are developed two other similar series on each side of the back of examples more advanced in age, and they are continued along each side of the tail, which thus is armed with a triple series. The tail of the larger specimens shows a distinct terminal fin, which, however, is small and confluent with the second dorsal. Beside the dark spots, white spots are more or less numerous on the disk and upper parts of the ventrals; they are more numerous in very young than in older examples.

Figures A and B represent our largest male, and C the typical specimen of the natural size. Length of specimens 3 $\frac{1}{2}$  to 11 $\frac{1}{2}$  inches. Off Cape Virgins. Station 313; 55 fathoms.

*Sebastes oculatus*; C. V. Station 306; 345 fathoms. Station 307; 147 fathoms. Porto Bueno.

*Agonus chiloensis*, Jen., Port Famine ; 10 to 15 fathoms.

*Aphritis gobio*, Gthr. (Pl. IX.).

Dr Cunningham has already had the opportunity of examining fresh examples (Trans. Linn. Soc., vol. xxvii. p. 469), and supplemented my original description (Ann. and Mag. Nat. Hist., 1861, vol. vii. p. 88), which was drawn up from dry skins. In the large, beautifully-preserved specimens collected by him and the naturalists of the Challenger, there is especially noticeable the great height of the dorsal fins, which exceeds that of the body. A short stout tentacle, which is often fringed, occupies the supero-posterior angle of the orbit, and other smaller tentacles are arranged in a series along the lower part of the side of the trunk and tail. Dr Cunningham states the colours, when fresh, to be—above, dusky brown; sides paler, blotched with brown and orange-yellow; under surface of head, breast, and belly orange-yellow. Length of specimens, 6 to 18½ inches. Porto Bueno Station 307; 147 fathoms. Tom Bay, Messier Channel. Port Famine, Station 312; 10 to 15 fathoms.

*Eleginus maclovinus*, C. V. Gray Harbour, Messier Channel. Port Stanley.

*Notothenia longipes*, Steindachner (Wien. S. B., 1876, vol. lxxii. p. 70, fig. 7).

The following specimens agree well with the description and figure given by Steindachner, but I count from 67 to 70 scales along the lateral line:—Length of specimens 3 to 7 inches. Station 306, Messier Channel; 345 fathoms. Station 312, Port Famine; 10 to 15 fathoms. Station 313, off Cape Virgins; 55 fathoms.

*Notothenia elegans*, n. sp. (Pl. XI. fig. C).

D. 6/33, A. 31, L. lat. 53. The length of the head is one-fourth of the total (without caudal), the height of the body one-seventh. The entire head is scaleless. Snout shorter than the eye, which is two-sevenths of the length of the head; interorbital space very narrow. Ventrals rather longer than the pectorals, and as long as the head, without snout, extending to the second anal ray. There are only two series of scales between the lateral line and the dorsal fin. Light brownish, with large transverse dark spots; the second dorsal with four series of small blackish spots; the first dorsal with the top salmon coloured; the other fins without distinct ornamentation. Length of specimen, 3⅔ inches. Off Cape Virgins; 55 fathoms.

*Lycodes macrops*, n. sp. (Pl. XI. fig. B).

The length of the head is a little more than that of the trunk and a little less than one-fifth of the total. Eyes large, two-sevenths of the length of the head, and longer than the snout which is broad, with the upper jaw overlapping the lower. Teeth in bands of

moderate width, subequal in size; a small patch of teeth on the vomer and a few teeth anteriorly on the palatine bones. More or less shallow grooves along the infraorbital and the mandible. Gill-opening of moderate width. The dorsal commences above the posterior portion of the pectoral; length of the pectoral one-half of that of the head; each ventral reduced to a short simple filament. Yellowish, with nine broad dark brown bands across the upper half of the fish, separated from one another by very narrow interspaces of the ground colour. The cross-bars are lighter in the centre, subocellated, and extend on to the dorsal fin. A brown band runs from the snout through the eye to the end of the operculum; throat and abdomen blackish. Length of specimen, 5 inches. Station 309; 40 to 140 fathoms.

*Merluccius gayi*, Guich.

*Merlus gayi*, Guichen. in Gay, Chile, vol. ii. p. 328; Ichth., lam. 8, fig. 2.

*Merluccius gayi*, Gthr., Fish., p. 346.

*Merluccius australis*, Hutton.

D. 10/43-44, A. 43. New Zealand, Coast of Chile to Straits of Magellan. Gray Harbour, Messier Channel.

*Macruronus novæ-zealandiæ*, Hect.

*Coryphaenoides novæ-zealandiæ*, Hect., Trans. N. Z. Inst., vol. iii. p. 136, pl. xviii. fig. 1.

*Macruronus novæ-zealandiæ*, Gthr., Zool. Record, vol. viii. p. 103; Hutton, Fish. New Zealand, fig. 79.

This species was hitherto known from New Zealand and Tasmania; its reappearance at the southern extremity of the American continent, therefore, is quite what may have been expected. Tom Bay, Messier Channel.

*Thysanopsetta*, n. gen. (Pleuronectidæ).

Body oblong; head small; cleft of the mouth of moderate width, the length of the maxillary being more than one-third of that of the head. Dentition nearly equally developed on both sides; teeth villiform, in bands; palatine and vomerine teeth none. Dorsal fin commencing above the front margin of the eye. Eyes on the left side, the upper but little in advance of the lower, both separated from each other by a narrow, flat, scaly interspace. Margin of the gill-opening of the coloured side fringed. Scales small, adherent, ctenoid, more distinctly so on the coloured side than on the blind. Lateral line straight. Straits of Magellan.

*Thysanopsetta naresi*, n. sp. (Pl. XI. fig. A).

D. 87, A. 59. The height of the body is two-fifths of the total length (without caudal), the length of the head one-fifth; snout rather shorter than the eye, the diameter

of which is two-sevenths of the length of the head; mouth oblique, the maxillary of the left side not quite extending to below the middle of the eye. The dorsal fin terminates at a short distance from the caudal, the rays being rather short. Caudal rounded. The left pectoral is scarcely longer than the right, and as long as the postorbital portion of the head; the left ventral is opposite to the right; a conspicuous fleshy lobe behind the left ventral, opposite to the commencement of the anal. Brown, indistinctly mottled with darker, all the rays of the vertical fins finely dotted with brown. Length of specimens, 6 and 7 inches. Off Cape Virgins; 55 fathoms.

*Haplochiton zebra*, Jen., Stream at Gray Harbour, Messier Channel. Lake at Porto Bueno. Port Stanley, Falkland Islands.

*Myxine australis*, Jen., Grapler Harbour, Messier Channel. Port Chirrucha, Straits of Magellan.

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### III. THE FISH FAUNA OF THE TEMPERATE ZONE OF THE SOUTH PACIFIC.

#### A. VALPARAISO AND JUAN FERNANDEZ.

During the month (November to December, 1875) the Challenger stayed at these localities, several undescribed shore fishes were obtained. The fishes of Juan Fernandez have scarcely been touched, and those known are chiefly such as are caught for food. Dr Steindachner has recently described several in a paper which will be quoted hereafter. The fauna of Chile and Juan Fernandez might be described, without much exaggeration, as a mixture of European and New Zealand forms; of the fishes mentioned here two being identical with, and four representative of, European species.

##### *Acanthias blainvilli*, Risso.

This common species of the Mediterranean seems to be widely spread in the temperate seas of the Southern Hemisphere. The British Museum possesses specimens from the Cape of Good Hope, Tasmania, and New Holland.

Specimens from Juan Fernandez have been noticed as *Squalus fernandinus* in Molina (Hist. Chile, p. 194), and as *Spinax fernandezianus* in Gay's Chile (Zool., vol. ii. p. 365); Dr Steindachner has described it as *Acanthias fernandinus* in Wien. S. B., 1875, vol. lxxi. p. 466. The distinctive characters given by the latter author are, in my opinion, quite insufficient for the specific discrimination of the Juan Fernandez specimens.

Female with foetus, preserved in salt. Juan Fernandez.

*Polyprion kneri*, Steindachner (Wien. S. B., 1875, vol. lxxi. p. 443).

D.  $10\frac{1}{2}$ , A.  $\frac{3}{8}$ . The height of the body is contained four and a half, the length of the head nearly three times in the total length. Snout pointed, the lower jaw projecting beyond the upper; head entirely covered with scales, with the exception of the lips which are naked. Intermaxillary band of teeth broader than that of the lower jaw, and interrupted in the middle. An oval patch of villiform teeth on the tongue. Operculum with two points, the lower of which is the termination of the straight, moderately raised, and smooth opercular ridge. A median rough bony ridge on the hinder part of the head superiorly. Dorsal spines moderately strong, shorter than the rays, the eighth the longest. Caudal emarginate. Scales small. Juan Fernandez. Length of specimen, 24 inches.

*Scorpaena thomsoni*, n. sp. (Pl. XII).

D.  $11\frac{1}{3}$ , A.  $\frac{3}{8}$ , P. 16, L. lat. 42. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head, twice and a half. Head nearly entirely naked; interorbital space very concave and narrow, the two ridges at its bottom being slightly prominent, divergent behind, and passing into the anterior nuchal spines; nuchal fossa shallow, square; supraorbital tentacles moderately developed; spines of the head strong and compressed. The third and fourth dorsal spines are the longest, and nearly as long as the second of the anal, about two-fifths of the length of the head. A band of palatine teeth. Reddish, marbled with darker; all the fins light coloured, scantily spotted. Length of specimen,  $10\frac{1}{2}$  inches. Juan Fernandez.

*Haplodactylus punctatus*, C. V., Valparaiso.

*Chilodactylus monodactylus*, Carmich., Juan Fernandez.

*Thyrsites atun*, Euphrasen., Valparaiso.

*Trachurus trachurus*, L., Valparaiso.

*Caranx georgianus*, C. V., Juan Fernandez:

*Caranx chilensis*, Gay; Steindachner, Wien. S. B., 1875, vol. lxxi. p. 459.

*Latilus jugularis*, C. V., Valparaiso.

*Trigla picta*, n. sp. (Pl. XIII. fig. A).

D. 7/11, A. 12. Scales exceedingly small. Præorbital spines short, only half as long as the eye; humeral spines extremely long and strong, as long as the eye; præopercular spines rudimentary, the others of medium size. Interorbital space concave, equal in width to the diameter of the eye. Dorsal spines strong, of moderate length; the pectoral reaches to the seventh anal ray. Lateral line not spiny. The whole body (with the

exception of the abdomen) and all the fins with deep black round drops. Length of specimen,  $10\frac{3}{4}$  inches. Juan Fernandez.

*Umbrina reedi*, n. sp. (Pl. XIII. fig. B).

D.  $9\frac{1}{24}$ , A.  $\frac{2}{3}$ , L. lat., 60 ca. The height of the body is one-third of the total length (without caudal), and somewhat more than the length of the head; the diameter of the eye is two-thirds of the length of the snout, which equals the width of the interorbital space which is very convex; the intermaxillary extends beyond the middle of the orbit; barbel very short. Dorsal spines rather strong; anal spine very strong, one-third of the length of the head. The pectoral fin does not extend to the vent, and is two-thirds the length of the head. Scales very thin, covered with minute scales on the base. Undulated black lines follow the series of the scales; pectoral, ventral, and anal blackish, with broad whitish margin.

The skin of a specimen, 23 inches long, from Juan Fernandez, was presented to the British Museum some years ago by Edwin C. Reed, Esq. It agrees in every respect with the following specimen from the same locality. Length of specimen,  $20\frac{1}{2}$  inches. Juan Fernandez.

*Porichthys porosus*, C. V., Valparaiso.

*Clinus microcirrhis*, C. V., Valparaiso.

*Atherinichthys brevianalis*, n. sp.

D. 6/11, A. 15, L. lat. 67, L. transv. 16. The origin of the anterior dorsal fin is opposite to the middle or posterior third of the ventral fins, and nearer to the base of the caudal than to the end of the snout. The distance between the origins of the two dorsal fins is less than one-half of that between the origin of the posterior and the caudal. The height of the body is somewhat less than one-fifth of the total length (without caudal), the length of the head one-fourth. Scales with two or three incisions. Pectoral shorter than the head. The silvery streak occupies the eighth series of scales and a part of the adjoining one. Length of specimen, 5 inches. Valparaiso.

*Genypterus chilensis*, Guich., Valparaiso.

*Merluccius gayi*, Guich., Valparaiso.

*Clupea sagax*, Jen., Valparaiso.

*Ophichthys dicellurus*, Rich., Valparaiso.

*Muraena porphyrea*, Guich., Juan Fernandez.

*Muraenopsis porphyreus*, Guichen. in Gay, Chile, Zool., p. 342, lam. xi. fig. 2.

*Muraena porphyrea*, Steindachner, Wien. S. B., 1875, vol. lxxi. p. 464.

*Bdellostoma polytrema*, Girard, Valparaiso. Fourteen gill-openings on each side.

(Zool. CHALL. EXP.—PART VI.—1880.)

## B. NEW ZEALAND.

During the short stay of the Challenger in New Zealand (June 28 to July 7), only a few shore fishes were collected, and these do not add to our knowledge of its fauna, which has been so well worked out by the indefatigable resident naturalists of that colony. Some of the species, like *Halargyreus johnsoni*, *Coryphænoides denticulatus*, and *Photichthys argenteus*, might be assigned to the deep-sea series; but they seem to frequently approach the surface, as we may judge from their being so often included in collections of shore fishes.

*Sebastes percooides*, Rich., Port Hardy, D'Urville Island.

*Scorpaena cruenta*, Sol. (dry), New Zealand.

*Trachichthys intermedius*, Hector (Trans. N. Z. Inst., vol. vii. p. 245, pl. xi).  
Station 166; 275 fathoms.

*Chilodactylus macropterus*, Forst., Port Hardy, D'Urville Island.

*Cyttus abbreviatus*, Hect. Station 166; 275 fathoms.

*Platystethus abbreviatus*, Hector, Trans. N. Z. Inst., vol. vii. p. 247, pl. xi.

*Percis colias*, Forst. (= *P. nyctomerus*, C. V.), Wellington Harbour; Port Hardy  
D'Urville Island.

*Hemerocætes acanthorhynchus*, Forst., Wellington Harbour.

*Notacanthus sexspinis*, Rich. (dry), Cook's Straits.

*Labrichthys celidota*, Forst. (See Gthr., Ann. and Mag. Nat. Hist., 1876, vol. xvii.  
p. 398), Wellington Harbour.

*Labrichthys bothryocosmus*, Rich., Port Hardy, D'Urville Island.

*Halargyreus johnsoni*, Gthr. (dry), New Zealand.

*Pseudophycis bacchus*, Forst., Port Hardy, D'Urville Island.

*Coryphænoides denticulatus*, Rich. (dry), Cook's Straits.

*Pseudorhombus boops*, Hect. (Trans. New Zealand Inst., vol. vii. p. 249, pl. xi).

D. 117, A. 89, L. lat. 78. The dorsal commences above the nostrils. The height of the body is two-fifths of the total length (without caudal), the length of the head nearly one-fourth. Scales ciliated; those on the head and on the anterior part of the body smaller than those on the tail. Interorbital ridge very narrow and naked. No spines or tubercles along the lateral line or the base of the fins. The curve of the lateral line is strong, but flat above. Snout rather shorter than the eye, the diameter of which is two-sevenths of the length of the head. Lower jaw scarcely prominent when the mouth is shut. The maxillary extends beyond the front margin of the eye and is two-fifths of the length of the head. Lower eye considerably in advance of the upper. Vertical fins



of moderate height, extending nearly to the root of the caudal. Left pectoral more developed than the right and rather more than one-half of the length of the head. Brownish; fin-rays indistinctly punctulated with brown. New Zealand. Length of specimens, 6 inches. Station 167; 150 fathoms.

*Photichthys argenteus*, Hutt. (dry), Cook's Straits.

*Monacanthus convexirostris*, Gthr., Queen Charlotte Sound.

*Bdellostoma cirrhatum*, Forst., Queen Charlotte Sound.

### C. COASTS OF SOUTHERN AUSTRALIA.

The fishes were collected principally at two places: close to Twofold Bay and at Sydney, at which place the ship remained from April 6 to June 8, 1874.<sup>1</sup>

*Raja nitida*, n. sp. (Pl. XIV. fig. A).

The angle formed by the front margins of the snout is obtuse, with a very thin median papillary projection. The width of the interorbital space is a little less than the length of the orbit, and the distance between the outer margins of the nostrils is likewise less than their distance from the extremity of the snout. Teeth with very small points, almost obtuse. Outer pectoral margin obtusely rounded, the greatest width of the disk being equal to the distance of the snout from the extremity of the ventral. All the upper parts covered with minute asperities; one or two curved spines in front and behind the orbit; one in the middle of the back, and a series along the median line of the tail. Upper parts light brownish, marbled with dark brown, the dark brown blotches being ornamented by small, round yellowish ocelli.

The single young specimen is a male; it is 8 inches long, the tail being  $4\frac{1}{2}$  inches; greatest width 5 inches. Off Twofold Bay; 120 fathoms (?).

*Etelis*, sp.

Partly from the want of a larger series of examples, partly from the indifferent state of preservation of the two very young examples obtained near Twofold Bay, I am unable to say whether the latter are the young of *Etelis carbunculus* or of a distinct species. These fishes evidently inhabit not inconsiderable depths. Length of specimens,  $2\frac{1}{2}$  inches. Off Twofold Bay; 120 fathoms (?).

*Enoplosus armatus*, White, Botany Bay.

*Chaetodon nesogallicus*, C. V., Botany Bay.

<sup>1</sup> [Off Twofold Bay a sounding was taken in 2200 fathoms. The ship then moved in towards the shore; the dredge was put over and we sounded again in 120 fathoms. As, in this instance, the dredge was dragged for a considerable distance up an irregular slope, it is impossible to say at what depth each particular species was taken.—C. WY. T.]

*Sebastes percooides*, Rich., Twofold Bay; 120 fathoms (?). Port Jackson; 30 fathoms.

*Scorpena cruenta*, Sol., Twofold Bay; 120 fathoms (?).

*Centropogon australis*, White, Port Jackson.

*Lepidotrigla phalæna*, C. V., Victoria; 38 fathoms. Bass Straits; 38 fathoms.

*Percis allporti*, Gthr. (Ann. and Mag. Nat. Hist., 1876, vol. xvii. p. 394), Bass Straits; 38 fathoms. Twofold Bay; 120 fathoms (?).

*Gobius brevifilis*, Day, Port Jackson.

*Gobius albopunctatus*, C. V., Port Jackson.

*Callionymus calauropomus*, Rich., Bass Straits; 38 fathoms.

*Callionymus phasis*, n. sp. (Pl. XV. fig. C).

D. 4/9, A. 7, C. 10. Præopercular spine considerably shorter than the eye, terminating in three curved spines, of which the two anterior are the larger, and directed upwards. Dorsal spines prolonged; second dorsal high; caudal long; the ventral fin extends somewhat beyond the origin of the anal. Gill-opening reduced to a small foramen on the upper side of the neck; lateral line single. The length of the head is one-third of the total length without caudal, or one-fourth with that fin. Eye very large, a little longer than the snout, one-third of the length of the head. Reddish-white with irregular broad blackish cross-bands on the back; first dorsal blackish, with some whitish zig-zag lines; second variegated with greyish; the other fins white. Length of specimen, 4 inches. Twofold Bay; 120 fathoms (?).

*Callionymus lunatus*, Schleg., Port Jackson; 6 to 8 fathoms.

*Blennius tasmanianus*, Rich., Port Jackson.

*Brachionichthys hirsutus*, Lac.

D 1/2/16, A. 9. Off Twofold Bay; 120 fathoms (?).

*Tripterygium*, sp., Port Jackson.

*Pseudophycis bacchus*, Forst., Twofold Bay.

*Gadus bacchus*, Forst., Descr. Anim., p. 120.

*Lota breviscula*, Rich., Voy. "Erebus" and "Terror," Fish., p. 61, pl. xxxviii. fig. 1.

*Pseudophycis brevisculus*, Gthr., Fish., vol. iv. p. 350.

#### *Lophonectes*, n. gen.

Body oblong, head small, cleft of the mouth very narrow, with the jaws and dentition nearly equally developed on both sides; teeth small, in single series; palatine and vomerine teeth none. Dorsal fin commencing above the nostrils, with the anterior rays produced. Scales of moderate size, thin, and deciduous. Lateral line with a strong curve anteriorly. Eyes on the left side. Bass Straits. Off Port Jackson.

*Lophonectes gallus*, n. sp. (Pl. XV. fig. B).

D. 87, A. 71, L. lat. 68. The height of the body is two-fifths of the total length (without caudal), the length of the head two-ninths; the snout is short, shorter than the eye, the diameter of which is a little less than one-fourth of the length of the head. Eyes separated by a very narrow ridge, the lower somewhat in advance of the upper, the upper not encroaching upon the upper profile. The mouth is obliquely directed upwards; the maxillary extending to the front margin of the eye and equalling it in length. Adult males with pointed tubercles on the snout; two on the sides, and one at the mandibular symphysis. The dorsal fin commences opposite the anterior nostril, and is continued to nearly the root of the caudal. In the adult the five anterior rays are prolonged into more or less long filaments. Left pectoral longer than the right, or as long as the head without snout. Ventrals separate: the rays of the left are arranged in the same line as the anal, the right ventral being shorter. The curve of the lateral line is sub-semicircular and short. Brownish, marbled with darker. Vertical fins irregularly and finely dotted with black. Ventrals with a black spot. Length of specimens,  $2\frac{1}{2}$  to  $5\frac{1}{2}$  inches. Station 162; 38 fathoms. Off Port Jackson; 30 fathoms.

*Læops*, n. gen.

Body oblong; head small; cleft of the mouth very narrow, with the dentition much more developed on the blind side than on the coloured. Teeth villiform, in narrow bands; palatine and vomerine teeth none. Dorsal fin commencing above the front margin of the eye. Scales small, thin, deciduous. Eyes on the left side. This genus appears to represent *Pleuronectes* in the Southern Hemisphere. Arafura Sea. South-Eastern Australia.

*Læops parviceps*, n. sp. (Pl. XV. fig. A).

D. 104, A. 86. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head five times and one-third. The snout is very short. The eye rather large; its diameter being contained thrice and one-third in the length of the head. A very narrow ridge, longitudinally grooved, separates the two eyes, the lower being conspicuously in advance of the upper. The mouth is directed upwards, and the maxillary of the left side extends scarcely to below the anterior margin of the eye. The dorsal fin commences opposite to the front margin of the upper eye and is continued to the root of the caudal, the rays being of moderate length. Caudal rounded. The left pectoral rather longer than the right and as long as the postorbital portion of the head. The rays of the left ventral are arranged in the same line as the anal, the right ventral being entirely on the right side. The lateral line makes a very short semicircular curve anteriorly, and is straight for the remainder of its course. The colour appears to have been uniform brown. Arafura Sea. South-Eastern Australia.

Length of specimens,  $2\frac{2}{3}$  to  $5\frac{1}{2}$  inches. Station 190; 35 to 49 fathoms Station 163, off Twofold Bay; 120 fathoms (?).

*Cnidoglanis megastoma*, Rich., Port Jackson.

(?) *Muraenichthys gymnotus*, Blkr., Port Jackson.

*Syngnathus superciliaris*, n. sp.

D. 23. Osseous rings 20 + 38. Snout as long as the postorbital part of the head, with a median ridge above, terminating on the interorbital space; neck compressed into a trenchant ridge; operculum without a keel, and with fine radiating striæ. Shields without spines; lateral line passing into the lower caudal edge; base of the dorsal fin not elevated, standing on three body and three caudal rings. Tail twice as long as the trunk. A very conspicuous filament above each eye. Pectoral and caudal fins well developed. - Brownish-grey, with indistinct darker cross-bands, and finely marbled with darker and lighter spots; snout and lower half of the head with oblique vermiculated brown lines. Length of specimens, 3 to  $6\frac{3}{4}$  inches. Port Jackson; 4 to 6 fathoms.

*Urocampus caelorhynchus*, Gthr., Port Jackson.

*Solenognathus fasciatus*, n. sp. (Pl. XIV. fig. B).

D, 41. Osseous rings 27 + 55. This species is most closely allied to *Solenognathus spinosissimus*, having the same rough and spiny scutes, but the forehead is somewhat broader, the dorsal longer and composed of more numerous rays, and the back of the trunk ornamented with seven narrow blackish cross-bars. Also the præanal region is blackish. Length of specimen, 12 inches. Off Twofold Bay; 120 fathoms. (Tail,  $5\frac{1}{2}$  inches long.)

*Ostracion cornutus*, L., Botany Bay.

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#### IV. THE FISH-FAUNA OF THE TROPICAL ZONE OF THE INDO-PACIFIC.

##### A. FISHES FROM THE RIVER MARY, QUEENSLAND.

Geographically only a portion of Queensland belongs to the Tropics; but among its fishes so thoroughly a tropical character predominates, that no one will associate them with the fauna of the more southern temperate parts. This refers to the fresh-water fishes as well as to those inhabiting its coasts. The Challenger did not touch in

Southern and Middle Queensland, and the fishes enumerated here were obtained chiefly during an excursion made by Sir W. Thomson.<sup>1</sup> All the species obtained are known to enter freely brackish and fresh water.

<sup>1</sup>[There seemed to us, from what we heard at Sydney, to be a chance of making valuable additions to the knowledge of the natural history of South-East Australia, by examining carefully the fauna of some of the rivers. Those in which *Ceratodus* had lately been discovered had the greatest interest for us, for we hoped that, besides getting a good supply of *Ceratodus* in all stages, we might by effective netting and other means find some additional forms of the Dipnoi.

Accordingly a little party, consisting of Lieutenant (now Commander) Aldrich, who afterwards commanded the sledge which ran westwards from the "Alert's" winter quarters along the coast of Grinnel's Land, Mr Murray, and myself, with Pearcey and a couple of blue-jackets in attendance, was organised to go to Brisbane during the stay of the ship at Sydney, with the view of pushing on, if time permitted, to the upper reaches of the Mary or the Burnet.

We got information and introductions from Dr Bennett, Mr Hill, and others. We prepared a stock of trammel nets, lines, and other fishing appliances, a box of dynamite cartridges, fowling pieces, and collecting gear of all kinds, and we arranged to leave Sydney by the "City of Brisbane" on Tuesday the 29th of April 1874; the vessel was, however, detained by bad weather till the 4th of May. We arrived at Brisbane on the morning of the 7th. An intimation of our intended trip had preceded us, and we found a kind invitation from the Marquis of Normanby to Government House awaiting us at the club, of which we had already been made honorary members.

We stayed a few days at Brisbane seeing all that was to be seen. The governor's A.D.C. tried to make arrangements to send us on to Gympie in carriages, but we found it more convenient to go by a coasting steamer to Maryburgh. The departure of the "Lady Bowen," the regular trading packet, was hurried to give us more time, and on Sunday the 10th we were steaming past a monotonous undulating coast-line, the low hills crowned with dusky woods of sombre gum-trees, past Fraser Island, one of the districts given up entirely to the natives, many of whom we saw in the distance, with a fine walk and gait, but absolutely unclothed. We were disappointed that none of them swam off to the steamer as they often do.

We reached Maryburgh on the morning of the 11th, and introduced ourselves to Mr Sheridan, the Collector of Customs, to whom we had been referred by Lord Normanby. We found Mr Sheridan a most pleasant companion, and a man of great intelligence and considerable special knowledge of natural science. He most kindly placed himself at our disposal during our stay, and he afterwards took the trouble to collect and send home to us a valuable collection of such species as we had not an opportunity of procuring in sufficient quantity during our short visit.

We went on in the evening in a couple of buggies through the bush of scattered gum-trees, to a little group of wooden shanties called Tiaro, about twenty miles above Maryburgh, on a pretty bend of the river Mary, with a good long stretch of open river, succeeded by some irregular rapids and deep pools, and overhanging woods farther up. The influence of the tide was slightly felt for a considerable distance beyond Tiaro, and some of the fishes had consequently an estuarine character.

We got the loan of a boat from a contractor who was deepening the river a little below Tiaro for the Queensland Government, and on the following day we were joined by Mr Sheridan with his boat and servant. We heard on all hands that the Barramunda (the native name for *Ceratodus*) was to be found occasionally in the neighbourhood, and we determined to spend the short time at our disposal in exploring the fauna of the river for a few miles up stream.

Lieutenant Aldrich and Mr Murray, with our escort and one or two natives whom we had secured, camped a little way up the river, and Mr Sheridan and I, as the seniors of the party, slept at Tiaro, rowing up the river in the morning, and usually reaching the camping-ground in time to supply the materials of stew for luncheon, of cockatoos, wallaby, ducks, &c., which we had shot by the way. For about ten days the river was fished day and night with net and rod, and fishes of several species were taken in large numbers, but we found no trace of *Ceratodus* or of any allied form. We had taken with us a number of powerful dynamite cartridges, and these were thrown, with a few feet of Bickford's fuse attached, into the deeper pools, and in a minute or so a shock like a blow from a heavy wooden mallet was felt on the bottom of the boat, one could see a slight rise on the surface of the water, and perhaps a hundred fishes of different sorts and sizes rose to the surface and floated on their backs or sides. Those we required were taken into the boat with a landing-net, and the rest recovered from their shock in a few minutes and swam away. The number of individual fishes taken in this way was very large, but it is somewhat singular that *Ceratodus* never occurred among them. At the end of about ten days three specimens of *Ceratodus* were taken, one by Lieutenant Aldrich with hook and bait, and two others afterwards, one by a native.

As our leave of absence was nearly exhausted, we now returned to Maryburgh, and after waiting for a few days to catch a return steamer, we rejoined the Challenger at Sydney.

*Ceratodus miolepis*, Gthr.

Irregularities in the arrangement of scales do not appear to be scarce in both species of this genus, and occur chiefly in the median line of the back or abdomen, some of the scales of the median series being either subdivided or confluent with those of the adjoining series. The specimens collected by the naturalists of the Challenger Expedition belong to the smaller-scaled species, which, as far as is known at present, is confined to the Mary River. In some twenty specimens from that river, which passed through my hands, the normal number of longitudinal series was found to be twenty-one, although in a few of them, as also in one of the specimens of the Challenger collection, one more or less may be counted on account of the irregularity mentioned. The Burnett *Ceratodus* (*Ceratodus forsteri*) is more rarely brought to Europe. I have seen three specimens only, which had eighteen rows of scales; but Dr A. B. Meyer mentions a specimen in which he counted twelve scales below the lateral line, or nineteen altogether (Ann. and Mag. Nat. Hist., 1875, vol. xv. p. 368).

*Oligorus macquariensis*, C. V., River Mary, near the village of Tiaro.

*Ctenolates ambiguus*, Rich., Queensland, lat. 27° 9' long. 144° 0'.

*Datnia ambigua*, Richards, Voy. "Erebus" and "Terror," Fish., p. 25, pl. xix.

*Ctenolates macquariensis*, Gthr., Proc. Zool. Soc., 1871, p. 320, pl. xxxiii.

*Therapon unicolor*, Gthr., Queensland, lat. 27° 0' S., long. 144° 0'; River Mary, near the village of Tiaro.

*Ambassis marianus*, n. sp.

D.  $7/\frac{1}{10-11}$ , A.  $\frac{3}{11}$ , L. lat. 28. The height of the body is two-fifths, or in young specimens less than two-fifths of the total length (without caudal), the length of the head one-third. The diameter of the eye is two-sevenths of the length of the head and two-thirds of that of the postorbital portion. Præorbital strongly serrated. Scales on the middle of the trunk much larger, and those on the nape much smaller than the remainder. Lateral line interrupted below the end of the spinous dorsal, the pores of the posterior portion being rather indistinct. The second dorsal spine is as long as, or sometimes a little longer than, the third, and one-fourth of the total length (without caudal). The third anal spine is longer than the second, but considerably shorter than the second of the dorsal. A narrow, silvery, longitudinal streak along the middle of the tail; the membrane between the second and third dorsal spines blackish. Caudal fin not coloured.

We had altogether some fair sport, and a good opportunity of seeing the natives and making ourselves familiar with the character of Australian scenery and the Australian fauna. I am sure all our party will long remember our months' excursion with pleasure.

Most of the fishes in the Queensland list were procured during this trip. Those marked lat. 27° 9' long., 144° 0' E., were collected by Mr Lyon at his station about 400 miles inland of Brisbane, and was sent by him to Mr Murray. —C. WY. T.]

Queensland. Length of specimens,  $1\frac{1}{2}$  to  $3\frac{1}{4}$  inches. River Mary, near the village of Tiaro.

*Chrysophrys australis*, Gthr., River Mary, near the village of Tiaro.

*Centropogon robustus*, Gthr., River Mary, near the village of Tiaro.

*Platycephalus insidiator*, Forsk., River Mary.

*Corvina australis*, n. sp.

D.  $10\frac{1}{2}$ -29, A. 2/7, L. lat. 49, L. trans.  $\frac{8}{16}$ . The height of the body is a little more than the length of the head, which is nearly one-fourth of the total (without caudal). Snout convex, with the upper jaw overlapping the lower, longer than the eye, the diameter of which is two-ninths of the length of the head. Dorsal spines very slender; anal spine rather strong, about one-half of the first ray and one-third of the length of the head. Margin of the præoperculum very finely crenulated. Coloration uniform silvery; upper half of the first dorsal blackish. Queensland. Length of specimens, 10 and 11 inches. River Mary, near the village of Tiaro.

*Periophthalmus schlosseri*, Pall., Cardwell, Queensland.

*Eleotris compressa*, Kreff, River Mary, near the village of Tiaro.

*Eleotris macrolepidota*, Bl., River Mary.

*Mugil cephalotus*, C. V., River Mary, near the village of Tiaro.

*Myxus elongatus*, Gthr., River Mary, near the village of Tiaro.

*Atherinichthys nigrans*, Rich., Queensland, lat.  $27^{\circ} 9' S.$ , long.  $144^{\circ} 0'$ ; River Mary, near the village of Tiaro.

*Copidoglanis tandanus*, Mitch., River Mary, near the village of Tiaro.

*Copidoglanis hyrtli*, Steind., Queensland, lat.  $27^{\circ} 9' S.$ , long.  $144^{\circ} 0'$ .

*Mosilurus hyrtli*, Steindachner, Wien. S. B., 1867, vol. lv. p. 14.

*Arius australis*, Gthr., River Mary, near the village of Tiaro.

*Arrhamphus sclerolepis*, Gthr., River Mary, near the village of Tiaro.

*Chatoëssus erebi*, Gthr., River Mary, near the village of Tiaro.

(?) *Chatoëssus erebi*, Gthr., Queensland, lat.  $27^{\circ} 9' S.$ , long.  $144^{\circ}$ .

*Megalops cyprinoides*, Brouss., River Mary.

*Anguilla mauritiana*, Benn., River Mary.

#### B. THE FIJI ISLANDS.

The Challenger stayed at this group from July 25 to August 10, 1874, and a considerable number of species were collected; but, with one exception, they belong to the common Polynesian forms of this well-known fauna.

*Serranus hexagonatus*, Forst., Levuka.

*Plectropoma maculatum*, Bl. (Probably = *Plectropoma leopardinum*, Lac.), Levuka, Fiji.

*Mesoprion bengalensis*, Bl., Kandavu.

*Mesoprion fulviflamma*, Forsk., Kandavu, Levuka.

*Mesoprion marginatus*, C. V., Levuka.

*Mesoprion semicinctus*, Q. and G., Levuka.

*Lutjanus semicinctus*, Quoy and Gaim.

*Mesoprion semicinctus*, Cuv., vol. ii. p. 485; Gthr., Fisch. d. Südsee, p. 15, pl. xvii.

*Apogon savayensis* (Gthr. Fisch. Südsee, p. 22, taf. xix. fig. B), Levuka.

*Therapon servus*, L., Levuka, Kandavu.

*Therapon oxyrhynchus*, Schleg., Ovalau.<sup>1</sup>

*Dules rupestris*, Lac., Ovalau.

*Dules marginatus*, C. V., Ovalau.

*Diagramma pardale*, C. V., Ovalau.

*Diagramma pictum*, Thunb., Ovalau.

*Scolopsis bilineatus*, Bl., Levuka, Ovalau.

*Scolopsis temporalis*, C. V., Kandavu.

*Gerres oyena*, Forsk., Kandavu.

*Lethrinus nebulosus*, Forsk., Levuka.

*Lethrinus ramak*, Forsk., Levuka.

*Lethrinus moensi*, Blkr. (Bleeker, Nat. Tyds. Ned. Ind., 1855, vol. ix. p. 435; Gthr., Fisch. Südsee, p. 64, pl. xlvi. fig. A), Kandavu.

*Lethrinus hæmatopterus*, Schleg., Kandavu.

*Sphaerodon grandoculis*, Forsk., Kandavu.

*Scorpcæna zanzibarensis*, Playfair, in Fish. Zanz., p. 47, pl. viii. fig. 2.

This species has hitherto been known from Zanzibar only. Levuka.

*Pterois zebra*, C. V., Levuka.

*Synanceia verrucosa*, Bl., Ovalau.

*Chætodon rafflesi*, Benn., Ovalau.

*Chætodon vagabundus*, L., Ovalau.

*Holacanthus cyanotis*, (Gthr. Fish., vol. ii. p. 517; and Fisch. d. Südsee, p. 52, taf. xl., fig. B), Kandavu.

*Heniochus macrolepidotus*, L., Ovalau.

*Myripristis murdjan*, Forsk., Ovalau.

<sup>1</sup> [The fishes in this list from Ovalau, were collected and presented to the Expedition by Mr Boyd, Fiji.—C. WY. T.]



*Upeneus indicus*, Shaw, Kandavu.  
*Upeneoides vittatus*, Forsk., Ovalau.  
*Percis hexophthalma*, C. V., Levuka.

*Plesiops corallicola*, Blkr. (Bleeker, Nat. Tyds. Ned. Ind., 1853, p. 280; Gthr. Fisch. d. Südsee, p. 87, taf. lviii. fig. B.).

A specimen obtained at Levuka is remarkable for having ten dorsal spines only. As I cannot detect any other marked difference from a specimen with eleven or twelve dorsal spines, I consider this specimen for the present as an individual variety. Length of specimen,  $2\frac{1}{2}$  inches, Levuka.

*Caranx speciosus*, Forsk., Levuka.  
*Platax orbicularis*, Forsk., Kandavu.  
*Psettus argenteus*, L., Levuka.  
*Equula fasciata*, Lac., Ovalau.  
*Acanthurus triostegus*, L., Ovalau.  
*Acanthurus blochi*, C. V., Ovalau.  
*Acanthurus gahm*, Forsk., Kandavu.  
*Acanthurus rhombeus*, Kittl., Levuka.  
*Naseus marginatus*, C. V., Ovalau.  
*Teuthis marmorata*, Q. and G., Kandavu.  
*Teuthis hexagonata*, Blkr., Kandavu.  
*Gobius phalæna*, C. V., Ovalau.

*Euctenogobius ophthalmonema*, Blkr., Kandavu.

*Gobius ophthalmonema*, Bleek, Nat. Tyds. Ned. Ind., 1856, vol. xii. p. 208.

*Euctenogobius ophthalmonema*, Gthr., Fisch. Südsee, p. 180, taf. cxi., fig. B.

*Eleotris macrolepidota*, Bl., Ovalau.  
*Eleotris fusca*, Bl. Schn., Levuka.  
*Eleotris longipinnis*, Benn., Ovalau.  
*Periophthalmus kölreuteri*, Pall., Kandavu.

*Petroscirtes oualanensis*, n. sp.

D.  $\frac{12}{8}$ , A. 20. The length of the head is a little more than the depth of the body and one-fifth of the total. Snout with the upper profile obliquely descending forwards. The canine teeth of the lower jaw are very large, those of the upper small. Orbital tentacle none. Diameter of the eye equals the width of the interorbital space. The dorsal fin is not elevated, commences on a line with the posterior margin of the præoperculum, and terminates at a short distance from the root of the caudal. The upper and lower caudal rays prolonged into filaments. Uniform light olive coloured in spirits. Ovalau. Length of specimens,  $2\frac{1}{2}$  and 3 inches.

- Petroscirtes*, sp. (not in g. st.), Ovalau.  
*Atherina lacunosa*, Forst. (Forst. Descr. An., p. 298; Gthr., Fisch. d. Südsee, p. 213, taf. cxviii., fig. E), Levuka.  
*Pomacentrus scolopsis*, Q. and G., Levuka.  
*Glyphidodon xanthozona*, Blkr., Levuka.  
*Glyphidodon assimilis*, Gthr., Ovalau.  
*PlatyGLOSSUS trimaculatus*, Q. and G., Levuka.  
*Julis dorsalis*, Q. and G., Ovalau.  
*Chilinus trilobatus*, Lac., Levuka.  
*Chilinus chlorurus*, Bl., Levuka.  
*Pseudoscarus nuchipunctatus*, C. V., Kandavu.  
*Pseudoscarus microrhinus*, Blkr., Kandavu.  
*Rhomboidichthys*, sp. (?) Levuka.  
*Solea heterorhina*, Blkr., Ovalau.  
*Saurus varius*, Lac., Ovalau.  
*Belone annulata*, C. V., Levuka ; Ovalau ; Kandavu.  
*Hemirhamphus commersoni*, Kandavu.  
*Clupea tembang*, Blkr., Levuka ; Kandavu.  
*Megalops cyprinoides*, Brouss., Ovalau.  
*Anguilla mauritiana*, Benn., fresh-water of Levuka ; Ovalau.  
*Muraena polyuranodon*, Blkr., Ovalau.  
*Doryichthys brachyurus*, Blkr., Ovalau.  
*Balistes stellatus*, Lac., Kandavu.  
*Balistes fuscus*, Bl. Schn., Kandavu.  
*Balistes aculeatus*, L., Kandavu.  
*Tetrodon immaculatus*, Bl., Ovalau.  
*Ostracion cornutus*, L., Ovalau.  
*Ostracion cubicus*, L., Ovalau.

### C. THE SEA BETWEEN AUSTRALIA AND NEW GUINEA.

The Challenger proceeded from the Fiji Islands to Api, one of the New Hebrides (August 18, 1874), to Raine Island (August 31), and to Cape York, where the Expedition stayed from September 2 to September 8. Much attention to collecting specimens was paid on the passage to the Arafura Sea, the trawl being used every day in this comparatively shallow basin ; finally the Aru and Ki Islands were visited (September 9 to September 27).

The fishes collected in this part of the Voyage may be conveniently enumerated separately, as comparatively little had been done previously in the exploration of this fauna ;

at least much less than in the Fiji group towards the east, and the East Indian Archipelago towards the west. It bears thoroughly the character of the Indo-Pacific Ocean, and probably none of the characteristic forms will be found to be absent. There is but a slight admixture of specifically Australian forms, like *Cnidoglanis*. The great proportion of new forms is due to the circumstance that a very interesting collection was made at Station 192 in the Ki Islands, at a depth of 129 fathoms: which depth appears to be sufficient to ensure the discovery of distinct species. Several of the fishes obtained there are so markedly distinguished as deep-sea forms as to necessitate their removal to that series.

*Trygon pastinaca*, L., Arafura Sea.

*Urolophus kaianus*, n. sp.

No dorsal fin. Disk much broader than long; the anterior margins meeting at a very obtuse angle. Snout not projecting. Tail a little shorter than the disk. Disk entirely smooth. Uniform brownish. Distance of the extremity of the snout from the vent,  $4\frac{3}{4}$  inches. Distance of the extremity of the tail from the vent,  $4\frac{1}{2}$  inches. Greatest width of the disk,  $5\frac{1}{2}$  inches. Ki Islands. Length of specimens,  $8\frac{3}{4}$  and  $9\frac{1}{4}$  inches. Station 192; 129 fathoms.

*Anthias megalepis*, n. sp. (Pl. XVI. fig. E).

D.  $\frac{10}{6}$ , A.  $\frac{3}{7}$ , L. lat. 30, L. transv.  $2\frac{1}{2}/12$ . The height of the body is rather more than one-third of the total length (without caudal), the length of the head two-fifths. The diameter of the eye equals the length of the snout, and is one-fourth of that of the head. Interorbital space flat, scaly, very narrow. The maxillary extends to, or nearly to, the posterior margin of the eye. A pair of canines in the upper jaw, and a pair in the middle of the side of the lower are well developed. Præorbital very narrow, narrower than the maxillary. Præoperculum strongly serrated. Six series of scales on the cheek. Dorsal spines of moderate strength and length, not so strong as the second of the anal fin. Pectoral extending to the first soft anal ray. Rose coloured; uniform, or with irregular blackish patches on the back. Ki Islands. Length of specimens, 3 to 4 inches. Station 192; 129 fathoms.

*Centropristis pleurospilus*, n. sp. (Pl. XVI. fig. D).

D.  $\frac{10}{6}$ , A.  $\frac{3}{7}$ , L. lat. 44, L. transv.  $\frac{3}{11}$ . The height of the body is two-ninths of the total length (without caudal), the length of the head two-fifths. The diameter of the eye is longer than the snout, and more than one-fourth of the length of the head. Interorbital space one-third of the diameter of the eye. The maxillary reaches beyond the vertical from the centre of the orbit. Præoperculum rounded throughout, serrated. Operculum with two spines. Six series of scales on the cheek; a series of four or five

oblong black spots along the side of the body. Ki Islands. Length of specimens,  $5\frac{1}{4}$  inches. Station 192; 129 fathoms.

*Myriodon waigiensis*, Q. and G. Station 186 (trawl).

*Serranus diacanthus*, C. V. Arafura Sea. Station 189.

*Mesoprion annularis*, C. V. Arafura Sea, Station 189.

*Mesoprion chrysotania*, Blkr. Somerset, Cape York.

*Apogon monogramma*, n. sp. (Pl. XVI. fig. B).

D.  $7\frac{1}{3}$ , A.  $\frac{2}{3}$ , L. lat. 26. The height of the body is one-third of the total length (without caudal), the length of the head two-fifths. Inner edge of the præoperculum not serrated. Dorsal spines of moderate strength, the fourth a little longer than the third. White (in spirits), with a well-defined narrow blackish band from the snout through the eye, to and along the central rays of the caudal fin. No black round spot at the base of the caudal. A narrow blackish line along the base of the soft dorsal and anal. Length of specimens, 2 to 3 inches. Arafura Sea.

*Apogon septemstriatus*, n. sp. (Pl. XVI. fig. A).

D.  $7\frac{1}{3}$ , A.  $\frac{2}{3}$ , L. lat. 28. The height of the body is two-fifths of the total length (without caudal), and equal to the length of the head. Inner edge of the præoperculum not serrated. Dorsal spines rather strong, the third and fourth equal in length. White (in spirits), with three well-defined narrow black streaks on each side; the first from the snout, through the eye, along the middle of the tail and caudal fin; the second from the snout along the superciliary margin to the back of the tail; the third from the occiput along the base of the dorsal fins; a seventh stripe runs along the median line of the head and nape. No black round spot at the base of the caudal. A narrow blackish line along the base of the soft dorsal and anal fins. Length of specimens, 3 inches. Arafura Sea.

*Apogon arafuræ*, n. sp. (Pl. XVI. fig. C).

D.  $7\frac{1}{3}$ , A.  $\frac{2}{3}$ , L. lat. 26. Form of the body as in *Apogon taniopterus*, but with the snout shorter, and the caudal fin rounded. Both limbs of the præoperculum are serrated; snout as long as the eye; interorbital space convex, as wide as the eye. Light coloured, with some indistinct darker transverse spots on the back; upper half of the first dorsal black; second dorsal and anal with a black band along the middle; upper margin of the second dorsal and posterior margin of the caudal black; pectoral, ventral, and hyoid region powdered with black. Length of specimen,  $4\frac{1}{2}$  inches. Arafura Sea.

(?) *Acropoma japonicum*, Gthr., Arafura Sea (not in good state).

*Therapon servus*, L., Somerset.<sup>1</sup>

*Therapon caudovittatus*, Rich., Somerset, Cape York.

*Priacanthus bennebari*, Schles., Arafura Sea.

*Pentapus vitta*, Q. and G. Station 188 (South of New Guinea).

*Propoma*, n. gen. (Pristipomatidæ).

This genus is closely allied to *Heterognathodon*, but differs from it in having nine dorsal spines only, in lacking the canine teeth in the upper jaw, and in having considerably smaller scales on the back.

*Propoma roseum*, n. sp. (Pl. XX. fig. B).

D.  $\frac{9}{10}$ , A.  $\frac{3}{7}$ , L. lat. 60, L. transv.  $\frac{5}{15}$ . The height of the body is contained thrice and a half or thrice and three-fourths in the total length (without caudal), the length of the head thrice and one-fourth or thrice and a half. Eye large, one-third of the length of the head, much longer than the snout, or than the width of the interorbital space. Snout rather convex and obtuse, with the jaws sub-equal in front; teeth very small, maxillary covered with scales, extending to, or nearly to, the centre of the eye. Præoperculum with a flat projecting spine at the angle, and with a very fine serrature along its lower limb; operculum with an acute small spine. Infraorbital extremely narrow, the end of the maxillary nearly touching the eye. Dorsal spines feeble, sub-equal in height; the third anal spine is the longest. Caudal fin deeply forked, with the lobes produced into filaments. Pectoral extending to the vent. Scales very finely ciliated. Apparently rose coloured during life; caudal fin yellowish. Lower parts silvery. Off Ki Islands. Length of specimen,  $5\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Gerres abbreviatus*, Blkr., Somerset.

*Lethrinus nebulosus*, Forsk., Somerset.

*Myripristis kaianus*, n. sp.

D.  $11\frac{1}{13}$ , A.  $\frac{4}{11}$ , L. lat. 29, L. transv.  $2\frac{1}{2}/7$ . The height of the body is rather more than the length of the head, and one-half of the total (without caudal). The diameter of the eye is two-sevenths of the length of the head, and twice the width of the interorbital space which is convex. The maxillary reaches to below the hind margin of the eye, and is not denticulated. Scales deeply serrated, those above the lateral line with acute long spines. Opercles covered with series of spines; opercular spine strong, of

<sup>1</sup> [The fishes in this list marked "Somerset, Cape York," were mostly taken with the seine at Albany Island.—C. Wy. T.]

moderate length. The third dorsal spine is the longest, nearly half as long as the head; the third anal spine much stronger and also longer than the fourth, and much longer than the opercular spine. Reddish-pink, with a silvery line along each series of scales. Ki Islands. (*a*) Length of specimen,  $7\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Sebastes hexanema*, n. sp. (Pl. XVII. fig. B).

D.  $11\frac{1}{3}$ , A.  $\frac{3}{5}$ , L. lat. ca. 53. The height of the body is contained thrice or thrice and one-third in the total length (without caudal), the length of the head nearly twice. The snout is considerably produced, the diameter of the eye being two-ninths of the length of the head, and two-thirds of that of the snout. The interorbital space is very narrow, concave, two-fifths of the length of the eye. Vertex with the spines rather prominent, and covered with very small scales. A simple tentacle above the anterior angle of the orbit, a second longer one above the middle of the eye, and a third, which is again shorter, between the nuchal spines. Other small tentacles along the lateral line. The maxillary extends nearly to below the middle of the eye. The band of vomerine teeth is V-shaped, that on the palatine bones very narrow. Tongue free and pointed. The third and fourth dorsal spines are the longest, rather less than one-third of the length of the head, and shorter than the second of the anal. Pectoral fin not quite reaching the anal. Rose coloured, with more or less indistinct blackish patches on the back, one extending over the dorsal fin, and occupying the space between the seventh and ninth spines. Ki Islands. Length of specimens, 2 to  $5\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Lioscorpius*, n. gen. (Scorpenidæ).

Head and body compressed, the former with muciferous cavities above, but with scarcely any ridges or spines. Occiput without groove, naked. Opercles armed as in *Sebastes*. Body covered with very small scales, and with a wide lateral line. Vertical fins not elongate. Dorsal fins entirely separate, the first with eight or nine spines. Pectoral fin long, without separate appendages. Bands of villiform teeth in the jaws, on the vomer and palatine bones. Seven branchiostegals.

*Lioscorpius longiceps*, n. sp. (Pl. XVII. fig. C).

D. 8 or  $9\frac{1}{11}$ , A.  $\frac{2\text{ or }3}{6}$ , P. 23, V.  $\frac{1}{5}$ . The height of the body is one-fourth of the total length (without caudal), and the length of the head is contained in it twice, or, one-fourth. Snout rather produced, the diameter of the eye being one-half of the length of the snout, and two-elevenths of that of the head. The interorbital space flat, its width being nearly equal to the diameter of the eye; the maxillary does not quite extend to the hind margin of the orbit. Armature of the head weak, and limited to a pair of minute spines

on the occiput, to another above the præoperculum, to two small ones on the præorbital, four on the margin of the præoperculum, and two on the operculum. The bands of teeth are very narrow, those on the vomer and palatine bones almost linear. Dorsal spines rather slender, the third and fourth are the longest, one-third of the length of the head. Anal spines feeble. Pectoral fin extending to the middle of the anal. Ventral fin thoracic, terminating at some distance from the vent.

Coloration, uniform reddish, with some obscure spots on the base of the second dorsal and caudal. Ki Islands. Length of specimen,  $4\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Pterois lunulata*, Schleg., Arafura Sea.

*Minous pictus*, n. sp. (Pl. XVIII. fig. D).

D.  $\frac{11}{10-11}$ , A. 12. The length of the head is two-fifths of the total length, without caudal, and equal to the length of the pectoral fin. Præorbital, with a rather strong spine, obliquely directed downwards and backwards, and with another small one in front. Interorbital space concave, equal in width to the vertical diameter of the eye. Dorsal spines slender; the three anterior a little remote from the remainder of the fin. Back and dorsal fin largely marbled with blackish-brown and white; lower parts and caudal whitish. Pectoral ventral and anal black; the posterior surface of the pectoral whitish, with a black stripe along each ray. Length of specimens, 2 to  $2\frac{1}{2}$  inches. Arafura Sea. Station 188. (South of New Guinea.)

*Platycephalus insidiator*, Forsk., Somerset.

*Platycephalus malabaricus*, C. V., Arafura Sea. Station 188; 28 fathoms.

*Platycephalus isacanthus*, C. V., South of New Guinea. Station 187.

*Platycephalus sculptus*, n. sp. (Pl. XVII. fig. A).

D. 9/11, A. 12, L. lat. 70 Length of the head is one-third of the total (without caudal), and its width between the præopercular spines is contained once and one-third in its length. Interorbital space very narrow and concave, its width being one-half of the vertical diameter of the eye, or one-fourth of the length of the snout. Snout rather obtuse. Bones of the head deeply sculptured with radiating striae. A series of spines along the superciliary margin, along the ridges of the crown of the head, along the opercular ridge, and along the infraorbital ring. Angle of the præoperculum armed with two spines, of which the upper is much longer than the lower, though not quite so long as the eye, and armed at the upper part of its base with a small accessory spine. Anterior half of the lateral line spiny. The third and fourth dorsal spines are the longest, one-half of the length of the head. A tongue-shaped membranaceous flap below the præ-

opercular spines. The bands of vomerine and palatine teeth are very narrow, almost linear. Coloration nearly uniform; a few indistinct cross bands; spinous dorsal with a black margin. Length of specimens, 2 and  $8\frac{1}{2}$  inches. Arafura Sea.

*Platycephalus spinosus*, Schleg., South of New Guinea. Station 187; 6 fathoms.

*Platycephalus pristiger*, C. V., South of New Guinea. Station 187.

*Trigla leptacanthus*, n. sp. (Pl. XVIII. fig. B).

D. 8/11, A. 12. Scales exceedingly small. The præorbital and suprascapular spines are slender and very long, as long or longer than the eye. Præopercular, opercular, and humeral spines short. Interorbital space concave, equal in width to the diameter of the eye. Dorsal spines of moderate length and strength. The pectoral reaches to the sixth or seventh anal ray. Lateral lines not spiny. Light reddish; back and base of the second dorsal with scattered irregular blue ocelli. A bluish streak below the canthus rostralis. Posterior surface of the pectoral fin blue, with a white margin all round, and a large black spot at the base. Ki Islands. Length of specimens, 4 to  $4\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Lepidotrigla spiloptera*, n. sp. (Pl. XVIII. fig. C).

D. 9/15, A. 15, L. lat. ca. 65. Scales very indistinctly serrated. Lateral line without spines. Anterior profile of the snout concave. Præorbital projecting in the form of a short triangular lamina. Interorbital space very concave, in width nearly equal to the vertical diameter of the eye. A deep transverse groove separates the interorbital space from the crown of the head. The spines of the dorsal fin are of moderate strength, those running along the base of the dorsal fins are well developed, lanceolate. Pectoral fin extending to the fourth anal ray. Coloration uniform reddish. Pectoral dark blue on its inner surface, with numerous white ocelli, and a white margin. In very young specimens the groove behind the eyes is but slightly indicated; the white ocelli on the pectoral fin are absent, and a blackish blotch occupies the membrane between the fourth and sixth dorsal spines. Ki Island. Length of specimens,  $3\frac{1}{2}$  to  $5\frac{1}{4}$  inches. Station 192; 129 fathoms. Arafura Sea.

*Dactylopterus orientalis*, C. V., Arafura Sea. Station 188.

*Peristethus moluccense*, Blkr. Station 192, Ki Islands; 129 fathoms.

*Pegasus natans*, L., Somerset, Cape York.

*Sillago ciliata*, C. V., Somerset, Cape York.



*Acanthaphritis*, n. gen. (Trachinidæ).

Head depressed, tail compressed. Cleft of the mouth sub-horizontal, with the upper jaw longest. Eye rather large, obliquely directed upwards. Scales large, ciliated. Two separate dorsal fins, the first with five or six spines. Ventrals jugular, with one spine and five soft rays. The lower pectoral rays branched. Bands of villiform teeth in the jaws, without canines; vomerine teeth in two small widely separate patches. Opercles unarmed; each præorbital with a horizontal spine pointing forward. Six branchiostegals. Gill-membranes entirely separate from each other, and from the isthmus.

*Acanthaphritis grandisquamis*, n. sp. (Pl. XVIII. fig. A).

D. 5-6/20, A. 24, L. lat. 33, L. transv. 8. Head depressed, its length being rather more than two-sevenths of the total length (without caudal); the eyes are large, occupying the second fourth of the length of the head, and standing very close together; mouth wide, the maxillary extending to below the middle of the eye. Occiput, cheeks, and opercles scaly. The first dorsal composed of feeble and short spines; the second high, the posterior rays being the longest, and extending in old specimens to the middle of the caudal fin. The anal commences immediately behind the first dorsal; caudal sub-truncated; pectoral broad, reaching to below the commencement of the second dorsal; ventrals reaching to the vent. The scales are very coarsely ciliated. Light olive coloured, with an indistinct series of silvery spots along the upper side of the body; the first dorsal black. Ki Islands. Length of specimens,  $2\frac{1}{4}$  to  $5\frac{1}{2}$  inches. Ki Islands, Station 192; 129 fathoms.

*Champsodon vorax*, Gthr., Arafura Sea, Ki Islands. Station 192; 129 fathoms.

*Uranoscopus fuscomaculatus*, Steindachner (Wien, S. B. 1868, vol. lviii. p. 319).

Previously known from Kandavu. Arafura Sea.

*Uranoscopus kaianus*, n. sp. (Pl. XIX. fig. A).

D. 4/13, A. 13. No barbel below the chin. The length of the head is contained thrice and two-thirds, or thrice and three-fourths in the total without caudal. Sub-operculum with one, præoperculum with four, five, or six spines pointing downwards. Humeral spine more or less directed upwards. Upper parts brown, with numerous round whitish spots. Lower parts whitish. First dorsal black. Ki Islands. Arafura Sea. Length of specimens, 7 to 10 inches. Station 192; 129 fathoms. Station 188; 28 fathoms.

*Caranx speciosus*, Forsk., Somerset.

*Caranx armatus*, Forsk., Somerset.

*Chorinemus toloo*, C. V., Somerset.

*Trachynotus ovatus*, L., Somerset.

*Hypsinotus rubescens*, Gthr.

D.  $\frac{7-8}{27-35}$ , A.  $\frac{3}{26-33}$ . Young specimens have the body comparatively less high than old ones; in the latter the depth exceeds much the length (fins excluded), in the former the length may even exceed the depth. Japan, Celebes. Ki Island. Length of specimens,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Upeneoides*, sp. (?), Arafura Sea.

*Gobius genivittatus*, C. V., fresh-water at Api, New Hebrides.

*Gobius albopunctatus*, C. V., Somerset.

*Gobius bynoensis*, Rich., Somerset.

*Gobius ornatus*, Rüpp., Somerset.

*Callionymus longicaudatus*, Schleg., South of New Guinea. Station 188.

*Callionymus kaianus*, n. sp. (Pl. XIX. fig. B).

D. 4/9, A. 9, C. 10. Præopercular spine shorter than the eye, terminating in three hooks, of which the hindermost points backwards and the middle upwards, both being barbed; the third is very small. Anterior dorsal spine prolonged, second dorsal high, caudal long. The ventral extends somewhat beyond the origin of the anal. The occipital region granulated on each side. Gill-opening reduced to a small foramen on the upper side of the neck. Lateral line single. The length of the head is contained thrice and one-fourth in the total length, without caudal. Eye as long as the snout, and one-fourth the length of the head. Reddish-white, with irregular, rounded violet spots along the middle of the side of the body. A lunate black spot between the third and fourth dorsal spines. Second dorsal ornamented with large subocellated and inframarginal bands. Ki Islands. Length of specimen, 7 inches. Station 192; 129 fathoms.

*Batrachus diemensis*, Les. Station 186 (trawl).

*Antennarius marmoratus*, Gthr., Ki Doulan, Little Ki Island.

*Tetrabrachium*, n. gen. (Pederalidæ).

Head large, compressed; cleft of the mouth vertical, narrow. Teeth very small. Eye small, projecting on the upper surface of the head. Skin naked. The spinous dorsal is reduced to three isolated spines, with the same arrangement and functions as in

*Antennarius*; the soft dorsal and anal rather long; pectoral with the upper portion detached. The gill-opening is reduced to a small foramen at the lowermost part of the root of the pectoral fin.

*Tetrabrachium ocellatum*, n. sp. (Pl. XIX. fig. C).

D. 1/1/1/18, A. 12, P. 4/5, V. 5. The head and body are strongly compressed, the trunk being very short; the neck is raised into a convex hump, the mouth looking upwards, transverse, without being cleft down the sides of the snout. The first and second dorsal spines are close together, situated above the upper lip, the first being very short and slender, the second as long as the mouth is wide and fringed. The third is again very small and delicate, and occupies the middle of the nape. Dorsal and anal rays short, enveloped in a tight membrane. Caudal rounded. The upper four pectoral rays form a separate portion; the lower part of the fin being horizontally spread out, and with the inner ray attached to the body in its whole length; also the ventral fins are attached to the side of the body by a loose membrane by which a kind of recess is formed. Eyes very small, prominent, covered by the general integument. The upper half of the fish is brownish, with numerous white ocelli greatly varying in size; they extend on the dorsal fin, but all the other fins are white, without any spots. South of New Guinea. Length of specimen,  $2\frac{3}{4}$  inches. Station 188; 28 fathoms.

*Sicydium*, sp., Fry., freshwater at Api, New Hebrides.

*Congrogadus subducens*, Rich. Station 186 (trawl).

*Mugil waigiensis*, Q. and G., Somerset.

*Glyphidodon septemfasciatus*, C. V., Raine Island.

*Glyphidodon sordidus*, Forsk., Raine Island.

*Heliastes roseus*, n. sp. (Pl. XX. fig. D).

D.  $\frac{1}{8}$ , A.  $\frac{3}{8}$ , L. lat. 26, L. transv.  $\frac{1}{10}$ . The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head three times. Eye very large, scarcely two-fifths of the length of the head. Snout extremely short, with the cleft of the mouth very oblique; maxillary narrow, not extending to below the middle of the eye. The lateral line pierces two or three scales behind the head, is then interrupted, and proceeds close to the base of the dorsal fin, at the end of which it stops. Caudal fin subtruncated. Pectoral with a broad base extending to the origin of the anal fin. Scales very finely ciliated. Uniform rose coloured. Off Ki Islands. Length of specimen,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Xiphochilus quadrimaculatus*, n. sp. (Pl. XX. fig. C).

D.  $\frac{1}{8}$ , A.  $\frac{3}{10}$ , L. lat. 30, L. transv.  $2\frac{1}{10}$ . The height of the body is rather less

than the length of the head, and contained thrice and three-sevenths in the total length (without caudal); snout rather short, as long as the eye, the diameter of which is two-sevenths of the length of the head. The maxillary reaches the front margin of the eye; both jaws with four canine teeth in front, the upper with a posterior one; operculum dilated into a large flap; three series of scales on the cheek; sub- and interoperculum scaly; præorbital as high as the orbit. Dorsal spines rather slender. Rose coloured; a blackish spot below the sixth and seventh dorsal spines on the lateral line; another above the end of the lateral line above the caudal fin. Length of specimen, 4 inches. Arafura Sea.

*Chærops cyanodon*, Rich., Somerset.

*Chærops ommopterus*, Rich. Station 186 (trawl).

*Ophidium murænolepis*, n. sp. (Pl. XX. fig. A).

The length of the head equals its distance from the vent, which is somewhat nearer to the end of the snout than to that of the tail. (In *Ophidium broussoneti* the distance of the vent from the end of the tail is nearly twice that from the end of the snout.) The scales are extremely small, not imbricate, elongate, and obliquely arranged as in an eel. The outer pair of barbels is considerably longer than the inner, and much shorter than the head. The lower branch of the outer branchial arch with four gill-rakers, which are very short, scarcely one-third of the diameter of the eye. No hook-like prominence at the ethmoid. Head entirely naked. Dorsal fin with a blackish edge. Ki Islands. Length of specimen, 7 inches. Station 192; 129 fathoms.

*Pseudorhombus russelli*, Gray, Arafura Sea; 35 to 49 fathoms.

*Rhomboidichthys angustifrons*, n. sp. (Pl. XXI. fig. B).

D. 83, A. 62, L. lat. 80. The height of the body is a little more than one-half of the total length with the caudal; the length of the head one-fourth; head about as high as long; anterior profile of the head parabolic, with a small notch in front of the interorbital space. Cleft of the mouth narrow, with the lower jaw prominent, and with the maxillary extending to below the front margin of the orbit; snout a little shorter than the eye, the diameter of which is two-sevenths of the length of the head. An inconspicuous knob superiorly on the maxillary, and on the front margin of the lower orbit. Length of the maxillary a little less than one-third of that of the head. Interorbital space very narrow, deeply concave, smooth. Vent on the left side. Scales of the coloured side ethmoid, of the blind side smooth. No spines along the base of the dorsal and anal fins. In the single specimen observed, the anterior dorsal rays are nearly detached and produced. Light brownish with indistinct darker spots, of which a series

runs along the base of the dorsal and anal; also the caudal is ornamented by a pair of similar spots, one being close to the upper and lower margin. Three large black ocelli, edged with white, and with a black outer ring, are placed in the middle of the body in the form of a triangle. Length of specimens,  $5\frac{1}{2}$  inches. Arafura Sea; 30 fathoms.

*Rhomboidichthys spilurus*, n. sp. (Pl. XXI. fig. A).

D. 90, A. 66, L. lat. 47. The height of the body is contained once and three-fourths in the total length (without caudal). Scales deciduous. Interorbital space scaly, concave; its width being equal to the diameter of the orbit, which is one-fourth of the length of the head; mouth narrow, the length of the maxillary being equal to the diameter of the eye. The dorsal fin terminates immediately before the root of the caudal, the left pectoral longer and more developed than the right. Greyish, finely marbled with brown; caudal with a pair of black spots on the middle of its length, each spot being close to the upper and lower margins.

This species is closely allied to *Rhomboidichthys grandisquama*, but distinguished by the much narrower interorbital space and smaller scales. South of New Guinea, Zebu. Length of specimen, 4 inches. Station 188; 28 fathoms.

*Samaris maculatus*, n. sp. (Pl. XXI. fig. A).

D. 73, A. 57. Scales very small. The height of the body is contained thrice and one-fourth in the total length without caudal, the length of the head thrice and three-fourths. None of the dorsal rays are prolonged, but the anterior are much more distant from each other than the succeeding. Right pectoral with narrow base, five-rayed, elongate, but shorter than the head. No pectoral fin on the blind side. Eyes very close together, the lower somewhat in advance of the upper. Light coloured, with a series of five distant black spots along the dorsal profile; a similar series along the anal profile, and a third composed of three spots along the lateral line. Vertical fins, with irregular blackish dots and blackish margins. Pectoral variegated with black. Ki Islands. Length of specimen, 4 inches. Station 192; 129 fathoms.

*Arnoglossus aspilus*, Blkr., Arafura Sea; 30 fathoms.

*Anticitharus*, n. gen.

Mouth wide, or rather wide; the length of the maxillary being more than one-third of that of the head. Teeth conical, of unequal size, in a single series in both jaws; vomerine and palatine teeth none. The dorsal fin commences on the snout. Scales of moderate size, smooth, deciduous. Lateral line, with a strong curve above the pectoral. Eyes on

the left side. Gill-membranes broadly united below the throat. Gill-rakers short and lanceolate. Ki Islands.

*Anticitharus polyaspilus*, n. sp. (Pl. XXII. fig. A).

D. 106, A. 82, L. lat. 75. Height of the body is contained twice and two-thirds in the total length (without caudal). The length of the head thrice and three-fourths. The curve of the lateral line is rather open, its span being equal to the length of the head without snout. Snout about as long as the eye, which is one-fourth of the length of the head. The eyes are separated from each other by a narrow scaleless ridge, the lower being considerably in advance of the upper. Mouth obliquely ascending upwards, but with the lower jaw scarcely projecting beyond the upper. The maxillary extends to behind the front margin of the eye. Anterior teeth stronger and longer than the lateral. The dorsal fin commences anteriorly on the snout, and is continued to the root of the caudal. Its anterior rays are somewhat longer than the succeeding, but not longer than those behind the middle of the length of the fin. Pectoral of the coloured side somewhat longer than that of the blind, and rather more than half as long as the head. Ventrals separate, opposite to each other, the anterior being rather in advance of the posterior. Coloration transparent, with some small black spots regularly disposed, but not constantly present. They form a series of three or four near the dorsal and ventral outlines; another along the lateral line; a pair of spots occupying the basal portion of the caudal. Similar but larger spots along the dorsal and anal fins. Ki Islands. Length of specimens, 7 and  $8\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Pæcilopsetta*, n. gen. (Pleuronectidæ).

Mouth rather narrow, the length of the maxillary being one-third of that of the head. Each jaw with a narrow band of villiform teeth. Vomerine and palatine teeth none. The dorsal fin commences above the middle of the eye. Scales very small. Gill-membranes united below the throat.

*Pæcilopsetta colorata*, n. sp. (Pl. XXII. fig. B).

D. 61, A. 50. The height of the body is contained twice and one-fourth in the total length (without caudal), the length of the head thrice and three-fourths. Lateral line with a semi-circular curve above the pectoral fin, the diameter of which is equal to three-fourths of the length of the head. Snout very short, with the jaws equal in front. Cleft of the mouth obliquely ascending upwards, the maxillary reaching beyond the anterior margin of the eye. Eyes large, one-third of the length of the head, opposite to each other, separated by a narrow, flat, scaly space; the upper encroaches upon the upper profile of

the head. Only the rays of the caudal fin are scaly. The dorsal fin commences above the middle of the eye, and is continued to within a short distance of the caudal. None of its rays are elongate. Pectoral equally developed on both sides, more than half as long as the head. Ventrals separate, opposite to each other. Light brownish; head and body with numerous black dots; dorsal and anal blackish; caudal with a large black spot near its upper and lower margins; pectoral with a large black spot occupying nearly the whole fin. Ki Islands. Length of specimens, 6 inches. Station 192; 129 fathoms.

*Læops parviceps*, Gthr. Station 190. Arafura Sea; 35 to 49 fathoms.

*Brachypleura novæ-zealandiæ*, Gthr., Arafura Sea; 35 to 49 fathoms. Coast of New Guinea; 30 fathoms.

*Solea kaiiana*, n. sp. (Pl. XXI. fig. C).

D. 70, A. 50, L. lat. ca. 70. The height of the body is two-fifths of the total length (without caudal), the length of the head rather more than one-fourth; the width of the interorbital space equal to the diameter of the eye. No pectoral whatever. Light brownish: head, body, and fins reticulated with brown, the network being more distinct towards the margins of the fish. Ki Islands. Length of specimen,  $4\frac{1}{4}$  inches. Station 192; 129 fathoms.

*Synaptura zebra*, Bl., Arafura Sea; 35 to 49 fathoms.

*Synaptura arafurensis*, n. sp.

D. 65, A. 52, P. 6, L. lat. 100. The height of the body is two-fifths of the total length, with the caudal; the length of the head one-fifth. Scales ciliated on both sides of the body, those of the neck not larger. There are several patches of black filaments on different parts of the body; the largest is in the middle of the length of the lateral line, two or three smaller ones along the base of the dorsal, and of the anal, and one on the base of the caudal. Upper jaw slightly overlapping the lower. The eyes are very small; they occupy jointly a single protuberance, which can partially be received in a hollow. Pectorals rudimentary, about one-sixth of the length of the head; the right is black between the rays, and its axil is black also. The last dorsal and anal ray extends beyond the middle of the length of the caudal. Nasal tubes short. Uniform brownish-grey. Arafura Sea. Length of specimen,  $4\frac{1}{4}$  inches. Station 190; 35 fathoms.

*Cynoglossus kopsi*, Blkr., Arafura Sea. Station 190.

*Cnidoglanis nudiceps*, n. sp.

Closely allied to *Cnidoglanis lepturus* and *Cnidoglanis microcephalus*, but with the occipital region osseous, and not covered with loose skin. Head depressed, small, its

length being equal to its distance from the vent; the nasal and maxillary barbels do not extend to the end of the head; lower lip not pendent or fringed; isthmus between the branchial membranes comparatively broad, as broad as the interorbital space. Intermaxillary teeth conical, in two subtriangular patches; vomerine teeth more obtuse, in two series which form a subrescentric band; mandibular teeth in a band. Eye of moderate size. The first dorsal is lower than the body, and placed at a very short distance from the occiput; spine serrated in front and behind, as long and strong as that of the pectoral fin. Light brownish, fins with a black margin. Length of specimen,  $8\frac{1}{2}$  to 9 inches. Arafura Sea.

*Saurus intermedius*, Agass.

Hitherto known from the Atlantic only. Arafura Sea.

*Saurus kaianus*, n. sp. (Pl. XXIII. fig. C).

D. 11, A. 10, V. 8, L. lat. 63, L. transv.  $3\frac{1}{2}/8$ . Body subcylindrical. Length of the head contained thrice and two-thirds in the total (without caudal). Snout depressed, pointed, nearly as broad as long, with the upper jaw projecting beyond the lower. Interorbital space slightly concave, narrower than the eye, the diameter of which is two-ninths of the length of the head. Frontal bones without sculpture. There are seventeen scales between the occiput and the dorsal fin. Dorsal fin as high as long. The pectoral fin extends to the twelfth scale of the lateral line. The series of scales on the tail without keel. Upper parts greenish, lower silvery. A series of blackish spots alternately larger and smaller along the middle of the body. Ki Islands. Length of specimen,  $5\frac{1}{2}$  inches. Station 192; 129 fathoms.

*Saurida grandisquamis*, Gthr., Arafura Sea.

*Belone strongylurus*, Blkr., Somerset.

*Belone annulata*, C. V., Somerset.

*Hemirhamphus quoyi*, C. V., Somerset.

*Hemirhamphus commersoni*, Cuv., Somerset.

*Chirocentrus dorab*, Forsk., Somerset.

*Phyllopteryx tæniophorus*, Gray, male with full pouch. Cape York. Station 186; 8 fathoms.

*Triacanthodes anomalus*, Schleg., Ki Island. Station 192; 129 fathoms.

*Monacanthus penicilligerus*, Cuv. Station 188; 28 fathoms.

*Monacanthus longirostris*, Cuv., New Caledonia.

*Monacanthus filicauda*, n. sp. (Pl. XXIII. fig. D).

D. 35, A. 37. Scales minute, the entire surface of the fish being uniformly covered with asperities longitudinally arranged. Dorsal spine rather slender, longer than the



snout, granular in front, and armed with a double series of barbs behind; it is placed above the hind margin of the orbit. Body elevated, its depth being contained once and three-fifths in the total length (without caudal). The origin of the dorsal fin is the highest point in the dorsal profile. Snout moderately produced, with the upper profile very slightly concave. Caudal fin obliquely truncated with the upper ray prolonged into a filament. Ventral spine movable, small. Light brownish, with more or less conspicuous darker spots; a round black spot immediately below the anterior third of the dorsal fin is constant. South of New Guinea. Length of specimen,  $3\frac{1}{2}$  to 5 inches. Station 188; 28 fathoms.

*Tetrodon nigropunctatus*, Bl., Arafura Sea; 35 to 49 fathoms.

#### D. THE EAST INDIAN ARCHIPELAGO.

A few species only were collected by the Expedition at Banda (September 30, 1874) and Amboyna (October 4). Better opportunities offered themselves during the prolonged stay of the Challenger at the Philippine Islands: Manilla was visited twice, from November 4 to 11, and from January 11, 1875, to January 14; Zebu was reached on the 18th, and its celebrated sponge-grounds were thoroughly examined; but the majority of fishes were obtained at Samboangan, where the Expedition landed several times. Some of the species collected there prove to be new, two being fluviatile.

*Chiloseyllium indicum*, Gm., Manilla.

*Serranus diacanthus*, C. V., Philippines. Station 203.

*Acropoma philippinense*, n. sp.

D.  $9\frac{1}{8}$ , A.  $\frac{2}{7}$ , L. lat. 31, L. transv.  $\frac{2}{5}$ . The height of the body is contained thrice and a half in the total length (without caudal), the length of the head twice and three-fifths. Eye one-third of the length of the head, and longer than the snout and the interorbital space. The two canine teeth of the upper jaw are strong, much longer than in *Acropoma japonicum*; lower jaw with a pair of small canine teeth in front, and with three strong ones on each side. Vomerine and palatine teeth small, in very narrow bands. Lower jaw not much projecting beyond the upper; maxillary without scales, not extending to the centre of the eye. Præoperculum with the angle slightly produced and serrated; operculum without prolongation. Dorsal spines rather feeble, the third being the longest, and half as long as the head. Caudal fin forked. Pectoral reaching to the vent. Uniform silvery, with the back greenish. Philippine Islands. Length of specimens, 2 to  $3\frac{1}{2}$  inches. Station 201; 82 to 102 fathoms.

*Therapon theraps*, C. V., Philippines. Station 203.

*Priacanthus*, sp. (?). Station 194, off Banda, in tow-net.

*Scolopsis monogramma*, C. V., Philippines. Station 203.

*Sebastes nematophthalmus*, Gthr. Hitherto known from the West Indies and Mauritius. Philippines. Station 201 ; 82 fathoms.

*Tetraroge longispinis*, C. V., Philippines. Station 203.

*Lioscorpius longiceps*, n. sp. (see p. 40). Station 204. Philippines.

*Equula fasciata*, Lac., Philippines. Station 203.

*Equula dussumieri*, C. V., Philippines. Station 203.

*Acanthurus hepatus*, L., Samboangan.

*Champsodon vorax* (Pl. XXIII. fig. A), (Gthr., Proc. Zool. Soc., 1867, p. 102).

D. 5/17-20, A. 17-19. A series of numerous and apparently full-grown examples enables me to correct an error in the original generic diagnosis, in which the bones of the head are described as unarmed. The angle of the præoperculum is armed with a long lanceolate spine obliquely directed upwards, and there are several denticulations on the hind margin of the same bone. Also the præorbital has some obtuse spines. Eye with one or two minute filaments at its supero-posterior angle. Two lateral lines become very distinct as soon as the fish is dry, and both are provided with lateral vertical branches. Length of specimens, 3 to 4 inches. Station 204 ; 115 fathoms. Philippines.

*Opisthognathus macrolepis*, Peters (Berl. Monatsber., 1866, p. 520).

B. 6, D.  $\frac{11}{1}$ , A. 13, L. lat. 56. The maxillary is not so much elongate as in the other species ; it reaches beyond the eye, but not to the angle of the præoperculum. The height of the body is one-fifth of the total length (without caudal), the length of the head a little less than one-third. Eyes very close together. The last spine of the dorsal fin considerably shorter than the first ray. Dorsal fin with a large black spot between the second and fourth spines. Length of specimen, 4 inches. Philippines. Station 201 ; 82 fathoms.

*Platycephalus*, sp., young, Philippines. Station 203. Straits near Zebu ; 18 fathoms.

*Peristethus murrayi*, n. sp. (Pl. XXXII. fig. A).

D. 7/21, A. 20, L. lat. 30. Præorbital processes narrow, narrower in their basal half than towards their extremity ; their length is one-third of the distance between their extremity and the front margin of the orbit. Snout and forehead without any spines ; a small spine above the posterior margin of the orbit, and one on each side of the occiput. Præopercular ridge prominent, trenchant, terminating in a slender spine nearly as long

as the eye. Interorbital space concave, its width being equal to the diameter of the eye. Anterior abdominal scutes not much longer than broad, and nearly equal in size to the posterior, which are as broad as long. Red, dorsal fins with a blackish margin. Sea of Banda. Length of specimen, 8 inches; 200 fathoms,

It seems that the sojourn at a moderate depth (200 fathoms) has not sufficed to effect a visible modification of the different organs of the fishes of this genus. However, it seems to me that also the other species of the genus, and especially the Mediterranean form, of the habits of which more is known than of any other, descend to greater depths than is generally supposed.

*Gobius echinocephalus*, Rüpp., Zebu.

*Callionymus curvicornis*, C. V., Philippines. Station 201; 82 fathoms.

*Callionymus calauropomus*, Rich. Station 204. Philippines; 115 fathoms. (This specimen, which is a male, has the first dorsal spine prolonged into a filament, and a black ocellus between the third and fourth spines.)

*Lophius naresi*, n. sp. (see p. 60, and Pl. XXV.) Station 204; 115 fathoms.

*Trypauchen vagina*, Bl., Amboyna; 15 fathoms.

*Amphisile scutata*, L., Philippines. Station 203; 10 to 20 fathoms.

*Ophiocephalus vagus*, Ptrs. (scarcely distinct from *Ophiocephalus striatus*, Bl.), Manilla.

*Duymæria flagellifera*, C. V. (= *Daymæria filamentosa*, Ptrs.), Samboangan.

*Bregmaceros maccllellandi*, Thomps., Amboyna; 15 fathoms.

*Pseudorhombus russelli*, Gray. Station 203. Philippines.

*Rhomboidichthys pavo*, Blkr., Island of Malanipa, near Samboangan.

*Rhomboidichthys spilurus*, n. sp. (see p. 47, and Pl. XXI. fig. A.), Straits of Zebu; fathoms, 18.

*Solea ovata*, Rich. Station 203. Philippines.

*Cynoglossus puncticeps*, Rich. Station 203. Philippines.

*Barbus maculatus*, C. V., var.

D. 11, A. 8, L. lat. 26, L. transv.  $4\frac{1}{2}/4\frac{1}{2}$ . The osseous dorsal ray is rather feeble, its stiff portion being about as long as the head without snout; its serrature is fine and rather inconspicuous. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The depth of the body is one-third of the total length (without caudal). The length of the head one-fourth. Snout of moderate length, a little longer than the diameter of the eye, which is one-fourth, or a little less than one-fourth of the length of the head. Barbels well developed, longer than the eye. The origin of the dorsal fin is slightly in advance of the vertical from that of the ventrals, and scarcely nearer to the end of the snout than to the root of the caudal. A

series of four round black spots along the middle of the side of the body, a fifth similar spot below the origin of the dorsal fin. Samboangan, Philippines. Length of specimens,  $2\frac{1}{2}$  to 5 inches. Pasananca, near Samboangan.

*Rasbora philippina*, n. sp.

L. lat. 28–29. The origin of the dorsal fin is much nearer to the base of the ventrals than to the anal, and opposite to the ninth and tenth scales of the lateral line. The length of the head is contained four and one-third times in the total (without caudal). Barbel none; maxillary extending to below the front margin of the eye. Pectoral as long as the head. A silvery band along the side of the tail. River at Pasananca, near Samboangan (Philippine Islands). Length of specimens,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches.

*Muraena richardsoni*, Blkr., Reefs near Zebu, Samboangan.

*Muraena nebulosa*, Ahl., Reefs of Zebu.

*Muraena*, sp.; young, Reefs near Zebu.

*Balistes verrucosus*, Bl., Schn., Reefs of Zebu.

*Monacanthus pardalis*, Rüpp., Reefs of Zebu.

*Monacanthus tessellatus*, n. sp. (Pl. XXIII. fig. B).

D. 36, A. 32. Skin velvety, without distinct scales. The depth of the body is one-half of the total length (without caudal). Snout long, the distance of the eye from its extremity being two-sevenths of the total length (without caudal). Upper profile very slightly concave. Gill-opening below the middle of the eye; root of the pectoral below its posterior half. Dorsal spine rather long, nearly half as high as the body above the posterior half of the eye, armed with four rows of barbs, of which the anterior are close together. Caudal with the margin rounded. Dorsal and anal fins but little higher anteriorly than posteriorly. Ventral spine small, fixed. Colour light brownish. Head and body ornamented with squarish dark brown spots, regularly arranged in transverse and longitudinal series; caudal blackish. Philippine Islands. Length of specimen, 5 inches. Station 204; 115 fathoms.

*Tetrodon immaculatus*, Bl., Schn., Philippines. Station 203.

*Tetrodon patoca*, H. B., Philippines. Station 203.

*Chilomycterus orbicularis*, Bl., Straits near Zebu; 18 fathoms.

E. HONG KONG.

The Expedition remained at this locality from November 16, 1874, to January 6, 1875. Its fish-fauna being well known, but few species were collected, one of which appears to be undescribed.

*Serranus diacanthus*, C. V.

*Mesoprion vitta*, Q. and G.

*Chilodactylus zonatus*, C. V.

*Sebastes marmoratus*, C. V.

*Scorpena cirrhosa*, Thunb.

*Drepane punctata*, L.

*Platycephalus insidiator*, Forsk.

*Platycephalus japonicus*, Tiles.

*Stromateus argenteus*, Bl.

*Gobius knutteli*, Blkr.

*Eleotris sinensis*, Lac.

*Apocryptes polyophthalmus*, Gthr.

*Callionymus curvicornis*, C. V.

*Trypauchen vagina*, Bl., Schn.

*Trypauchen chinensis*, Steind., off Hong Kong, in 10 fathoms.

*Ctenotrypauchen chinensis*, Steindachner, Wien. S. B., 1867, vol. lv. p. 530, taf. vi. fig. 3.

*Trypauchen chinensis*, Steindachner, *ibid.*, p. 708.

*Ophiocephalus maculatus*, Lac.

*Pseudoscarus nuchipunctatus*, C. V.

*Pseudorhombus cinnamomeus*, Schleg., off Hong Kong, in 7 fathoms.

*Arnoglossus tenuis*, n. sp.

D. 93, A. 70, L. lat. 48. Scales very thin and deciduous. The height of the body is two-fifths of the total length (without caudal), the length of the head two-ninths. The greatest depth between the anal fin, and the straight portion of the lateral line is less than the length of the head. Snout with the lower jaw somewhat projecting, as long as the diameter of the eye, which is nearly one-fourth of the length of the head. The length of the maxillary is one-third of the length of the head, that of the mandible rather less than one-half. Eyes separated by a very narrow ridge, the lower being considerably in advance of the upper. Lateral line with a semicircular curve above the pectoral. The dorsal and anal are continued on to the root of the caudal, and the rays of moderate length. The rays of the left ventral occupy the whole length between throat and vent. Humeral arch without projecting spines. Coloration uniform. Length of specimens,  $2\frac{1}{2}$  and  $4\frac{1}{2}$  inches.

*Solea ovata*, Rich., off Hong Kong; 7 fathoms.

*Cynoglossus melampetalus*, Rich., off Hong Kong; 7 fathoms.

*Saurida argyrophanes*, Rich.

*Cyprinus auratus*, L.

## F. THE ADMIRALTY ISLANDS.

The visit of the Challenger to the Admiralty Islands extended from March 4 to March 10, 1875. The fishes collected are, as might have been expected, identical with those of the Indo-Pacific Ocean. Three have proved to be undescribed, viz., a *Lophius*, which also occurs in the Philippines, and two *Pleuronectidæ*; they are inhabitants of the moderate depth of 150 fathoms.

- Mesoprion monostigma*, C. V., Nares Harbour.  
*Spharodon grandoculis*, Forsk., Nares Harbour.  
*Gerres macracanthus*, Blkr., Nares Harbour.  
*Pimelepterus waigiensis*, Q. and G., Nares Harbour.  
*Upeneus barberinus*, C. V., Nares Harbour.  
*Peristethus liorhynchus*, Gthr., outside Nares Harbour; 152 fathoms.  
*Sillago sihama*, Forsk., Nares Harbour.  
*Champsodon vorax*, Gthr., outside Nares Harbour; 152 fathoms.  
*Caranx crumenophthalmus*, Bl., Nares Harbour.  
*Platax orbicularis*, Forsk., (= *vespertilio*, Bl.), Nares Harbour.  
*Acanthurus blochi*, C. V., Nares Harbour.  
*Teuthis concatenata*, C. V., Nares Harbour.  
*Teuthis vermiculata*, C. V., Nares Harbour.  
*Teuthis margaritifera*, C. V., Nares Harbour.

*Lophius naresi*, n. sp. (Pl. XXV.).

D.  $3\frac{3}{8}$ , A. 6. Head and body covered with long fringes. Interorbital space deeply concave, with sharp raised denticulated superciliary edges. Humeral spine simple, acute. Mouth behind the hyoid greyish. Length of specimens, 3 and 8 inches. Nares Harbour, Admiralty Island. Station 219. North of New Guinea. 152 fathoms.

*Pseudorhombus ocellatus*, n. sp. (Pl. XXIV. figs. A and B).

D. 88, A. 75-76. Scales minute, but distinctly imbricated, not ciliated; lateral line anteriorly with a strong curve, the diameter of which equals the length of the pectoral fin. The height of the body is one-half of the total length (without caudal), the length of the head one-fourth. Eyes separated merely by a ridge, large, one-third of the length of the head, the lower considerably in advance of the upper. One (male) specimen with a small spine in front of each eye, another above the mouth, and a fourth at the mandibular symphysis. Snout very short, with the narrow mouth obliquely directed upwards, the maxillary terminating immediately behind the front margin of the orbit. The dorsal fin

commences above the nostrils, is not scaly, and terminates close to the caudal, its anterior rays being shorter than the middle ones. In the male the thirteenth to nineteenth rays of the dorsal, and the seven anterior of the anal, are prolonged into long filaments. Pectoral as long as the postorbital portion of the head. Ventrals distinct, opposite to each other. Brown, with scattered, more or less irregular whitish ocelli, margined with black. Fin-rays with black dots, and some entirely black for some portion of their length. On the blind side the anterior half of the body is whitish, the posterior blackish. Admiralty Islands. Length of specimens,  $5\frac{1}{2}$  inches. Outside Nares Harbour; 152 fathoms.

*Nematops*, n. gen. (Pleuronectidæ).

Cleft of the mouth narrow. Teeth minute; scarcely any teeth on the coloured side. Vomerine teeth none. The dorsal fin commences above the eye. Scales rather small, ciliated. Lateral line with a strong curve anteriorly. Eyes on the right side, large, each provided with a tentacle, the upper encroaching upon the upper profile.

*Nematops microstoma*, n. sp. (Pl. XXIV. fig. C).

D. 64, A. 54, L. lat. 65. The height of the body is contained twice and a half in the total length (without caudal), the length of the head four times and a third. Snout extremely short, with narrow mouth obliquely ascending upwards. Eyes very large, two-fifths of the length of the head, very close together, the upper encroaching upon the upper profile. Tentacle nearly as long as the eye, attached to its posterior half. The eyes are inserted on the same level. The dorsal fin commences above the middle of the eye, and terminates at a very short distance from the caudal; its rays are of moderate length. Pectorals of both sides nearly equally developed, half as long as the head. Ventrals separate, opposite to each other. The scales of the coloured side are indistinctly ciliated, those of the blind smooth. The curve of the lateral line is semicircular, with a diameter shorter than the head. Dorsal and anal rays dotted with black, and a larger black spot on the posterior dorsal and anal rays. Caudal black, with a broad whitish posterior margin. Length of specimen,  $3\frac{3}{4}$  inches. Outside Nares Harbour, in 152 fathoms.

*Belone liuroides*, Blkr., Nares Harbour.

*Clupea moluccensis*, Blkr., Nares Harbour.

*Balistes maculatus*, Gm., North of Admiralty Islands.

G. THE FRIENDLY AND SOCIETY ISLANDS.

But few species were collected during the Challenger's stay at Tongatabu (July 20, 1874), to which were added a small number from Tahiti (September 1875). None of them are of special interest.

*Zygæna malleus*, Risso, (stuffed), Tongatabu.

*Trygon kuhli*, M. and H., Tongatabu.

*Serranus dispar*, Playf., Tongatabu.

*Mesoprion fulviflamma*, Forsk., Tongatabu.

*Dules marginatus*, C. V., Papeuriri, Otaheiti.

*Cæcio tile*, C. V., Tongatabu.

*Gerres oyena*, Forsk., Tongatabu.

*Holocentrum spiniferum*, Forsk., Tongatabu.

*Caranx hippos*, L., brackish water near Papiete, Tahiti.

*Caranx hippos*, L. : Gthr., Fish., vol. ii, p. 449, and Fisch. d. Südsee, p. 131, taf. lxxxiv.

*Acanthurus* (?), sp., young (*Acronurus*), brackish water near Papiete, Tahiti.

*Eleotris fusca*, Bl., Schn., streams and brackish water near Papiete, Tahiti.

*Mugil kelaarti*, Gthr., Tongatabu.

*Mugil tongæ*, n. sp.

D.  $4\frac{1}{8}$ , A.  $\frac{3}{8}$ , L. lat. 45, L. transv. 16. The height of the body is one-fourth of the total length (without caudal), the length of the head two-sevenths; the snout is very broad, the width of the interorbital space being a little more than two-fifths of the length of the head. Eye with a broad adipose membrane. Lips thin; the maxillary is nearly entirely covered by the præorbital, only a narrow strip of its extremity being visible; cleft of the mouth nearly twice as broad as deep; the angle made by the anterior margins of the mandibles slightly exceeding a right one. Anterior dorsal spines half as long as the head, occupying the middle of the distance between the snout and the root of the caudal. There are about twenty-six scales between the snout and the spinous dorsal fin; the eleventh, thirteenth, and twenty-seventh scales of the lateral line correspond to the extremity of the pectoral fin, and to the origins of the two dorsals. Coloration uniform. Length of specimen,  $6\frac{1}{2}$  inches. Tongatabu.

*Gomphosus tricolor*, Q. and G., Harbour of Tahiti.

*Anguilla aneitensis*, Gthr., Lake Waihirra, Tahiti. A malformed specimen from River near Lake Waihirra.

*Anguilla mauritiana*, Benn., Lake Waihirra, Tahiti.

*Ophichthys maculosus*, Cuv., Tongatabu.

*Muraena nebulosa*, Ahl., Tahiti.

*Muraena richardsoni*, Blkr., Tahiti.

*Diodon hystrix*, L., Tahiti.



## H. THE SANDWICH ISLANDS.

The Challenger stayed a fortnight at Honolulu, and five days at Hilo, Hawaii. The fauna is almost purely Polynesian, although we may remember that several species from the West Coast of America have strayed as far eastwards as to reach this group. Most of the fresh-water species, on the other hand, are peculiar to this isolated group; and the Expedition obtained two Blennioids which hitherto had escaped observation.

*Zygæna malleus*, Risso, Reefs at Honolulu.

*Dules marginatus*, C. V., Hilo, Hawaii (seine). Reefs at Honolulu.

*Scorpena nuchalis*, Gthr. (Fisch. d. Südsee, p. 76).

If the two following specimens really belong to this species, it is subject to variation of colour, the Sandwich Islands specimens showing no white dots on any part of their body; both, however, have a broad light band across the nape and side of the head. One of the specimens has a large black spot between the four last dorsal spines, which is absent in the other specimen. The typical specimen came from Rarotonga. Length of specimens,  $2\frac{1}{2}$  to 3 inches. Reefs at Honolulu.

*Cirrhitès arcatus*, C. V., Reefs at Honolulu.

*Cirrhichthys maculatus*, Lac., Reefs at Honolulu.

*Caranx crumenophthalmus*, Bl., Reefs at Honolulu.

*Caranx hippos*, L., Hilo, Hawaii (seine).

*Acanthurus blochi*, C. V., Reefs at Honolulu.

*Upeneus trifasciatus*, Lac., Reefs at Honolulu.

*Polynemus seæfilis*, C. V., Hilo, Hawaii (seine).

*Gobius stamineus*, Valenc. (Voy. Bonite Poiss., p. 179, pl. v. fig. 5).

This is the first time that this species has been rediscovered since it was described and figured by Valenciennes. Although the figure given in the French Voyage is recognisable as far as the form is concerned, the coloration seems to be imaginary, and is certainly very different from that of the specimens before me. This species is closely allied to *Gobius ocellaris* and *crassilabris*; from the former it differs in having smaller scales on the neck, and in lacking a black dorsal spot; from the latter in having the eye placed farther back.

D. 6/11, A. 11, L. lat. 60. Fifteen longitudinal series of scales between the origin of the second dorsal and anal; scales on the neck much smaller than those on the tail; cheeks and opercles naked. The height of the body is four and one-half times, the length of the head thrice or thrice and one-fourth the total length (without caudal).

Head low, flattened above, with the snout much produced, the small eye being nearer to the gill opening than to the end of the snout. Mouth horizontal, scarcely extending to the eye, with projecting upper jaw and very thick lips. Teeth in villiform bands, without canines. Interorbital space wider than the eye in old specimens, and of about the same width in younger ones. Dorsal fins lower than the body, caudal rounded; ventral terminating a long way from the vent, with broad basal membrane. Yellowish or brownish, with irregular darker spots, some in the middle of the body being arranged more or less distinctly in a longitudinal series; the rays of the dorsal fins and of the caudal with small black spots; a round spot at the root of the caudal, and an oblong one on the upper part of the root of the pectoral are rather constant. Length of specimen, 2 to 8 inches. Fresh-waters of Honolulu. Streams of Hawaii.

*Gobius sandvicensis*, n. sp.

D.  $6\frac{1}{9}$ , A. 9, L. lat. 35. Twelve longitudinal series of scales between the second dorsal and the anal. Only a few very small scales before the dorsal, the nape and the whole head being naked. The height of the body is contained five and a half times in the total length (without caudal), the length of the head four times. The head is rather broader than high, with the cheeks swollen. Interorbital space very narrow. Eye as long as the snout, which is convex. Cleft of the mouth scarcely oblique. Jaws equal in front; a curved canine tooth on each side of the jaw. Upper pectoral rays silk-like. Dorsal and anal fins of moderate height. Caudal fin obtusely rounded, not quite so long as the head. The ventral fin does not quite reach to the vent, and has the basal membrane well developed. Reddish-olive with lighter dots, and with a series of larger brown spots along the lower half of the side of the body. Vertical fins dotted with brown. Length of specimen,  $1\frac{1}{2}$  inches. Honolulu, fresh-water.

*Eleotris fusca*, Bl., Schn., Honolulu, fresh-water.

*Sicydium nigrescens*, n. sp. (Pl. XXVI. fig. C).

D: 6/11, A. 11. The scales on the nape, on the anterior half of the trunk, and on the abdomen, are very small; sixteen longitudinal series may be counted between the origin of the first dorsal and anal. Head small, two-ninths of the total length (without caudal), broad, with small eye, the diameter of which is scarcely one-half of the width of the interorbital space. In the adult the third dorsal spine is prolonged into a filament, and the posterior rays of the second fin are much prolonged, so as to extend sometimes beyond the root of the caudal. Old specimens are nearly uniform black. Younger ones are sometimes of a lighter colour, with irregular and indistinct dark transverse spots and bands. Caudal without spots or bands. Length of specimen, 2 to 5 inches. Honolulu, fresh-water. Streams in the Island of Hawaii.

*Lentipes concolor*, Gill., Streams of Hawaii.

*Sicyogaster concolor*, Gill., Proc. Ac. N. Sc. Philad., 1860, p. 102.

*Lentipes concolor*, Gthr., Fish., vol. iii. p. 96.

*Lentipes seminudus*, n. sp.

D. 6/11, A. 10. A small fish, two inches long, and in an indifferent state of preservation, seems to be a second species of this genus, having the same singular dentition as *Lentipes concolor*, but the tail is covered with small scales, the head and trunk only being naked. It is an adult specimen, the ovaries being fully developed. The eyes are small, situated in the anterior half of the length of the head. The length of the head is one-fourth of the total, the caudal not included. The vent is somewhat nearer to the root of the caudal than to the head. Length of specimen, 2 inches. Honolulu, fresh-water.

*Mugil dobula*, Gthr., Hilo, Hawaii (shore).

*Dascyllus albisella*, Gill., Honolulu Reefs.

*Julis obscura*, n. sp. (Pl. XXVI. figs. A and B).

D.  $\frac{8}{13}$ , A.  $\frac{2}{11}$ , L. lat. 29, L. transv.  $3\frac{1}{2}/10$ . The determination of this species is rather doubtful, as it seems subject to great variation of colour, without being distinguished by some striking and constant peculiarity. There are four specimens in the collection, three of which are young, and the fourth apparently adult. The dorsal spines are remarkably short, and the upper and lower caudal lobes produced into short filaments. In the young the body is of a brownish-violet colour, which extends sometimes over the whole caudal fin, sometimes stopping short at the base of that fin, leaving it white. Scales with or without an indistinct vertical purplish line. Head apparently without markings. Dorsal and anal fins uniform blackish, or if of a lighter colour, with a black spot between the three anterior spines. Pectoral fin with a black spot superiorly at the base, and with a broad black longitudinal band, which sometimes becomes indistinct.

The adult has the ground colour light reddish, only the end of the tail, and the upper and lower margins of the caudal being black. Each scale with a vertical purple streak. Dorsal and anal fins greyish, without black spot in front. Pectoral light yellow, without black band, and without axillary spot. Length of specimen, 4 to 7 inches. Honolulu.

*Rhomboidichthys pantherinus*, Rüpp., Honolulu Reefs.

*Chanos salmoneus*, Forst., Reefs at Honolulu.

*Albula conorhynchus*, Bl., Schn., Hilo, Hawaii (seine); Hilo, Hawaii (seine).

*Conger marginatus*, Val., Reefs at Honolulu.

*Muraena flavo-marginata*, Rüpp., Reefs at Honolulu.

*Muraena* (?), sp., Reefs at Honolulu.

*Doryichthys pleurotania*, n. sp. (Pl. XXVI. fig. D).

D. 25, Osseous rings 18 + 14. The edges of each ring terminate in a slightly prominent spine. Lateral line continuous, passing into the lower caudal edge. Snout with denticulated ridges; operculum with a slightly oblique raised line, below which there are several other radiating keels; snout shorter than the remaining portion of the head; interorbital space concave, the supraorbital ridge being raised, but scarcely serrated. Vent behind the middle of the dorsal fin, equidistant from the root of the pectoral, and from the end of the caudal. Pectoral shorter than the operculum; caudal longer than the snout. Light greyish, with a brownish-black band from the snout along the middle of the body and caudal fin.

Distance of the snout from the vent, 14 lines. Distance of the vent from the end of the caudal, 9 lines.

The figure is twice the natural size. Length of specimen, 23 lines. Off Honolulu; 18 fathoms.

*Balistes buniva*, Lac., Reefs at Honolulu.

#### I. JAPAN.

A considerable collection was brought together during the prolonged stay of the Expedition in Japan (April 11 to June 16, 1875). All the specimens were obtained on the southern and south-eastern shores of Nipon, viz., at Yokohama (where, besides marine fishes, several fresh-water species were purchased in the market), and from fishing-boats off Inosima. These boats were fishing with long lines in 400 fathoms. They had small hooks attached all along the lines, and on these they brought up, along with a number of deep-sea fishes, specimens of *Hyalonema*, and many Pennatulids and other Alcyonarians. The ship dredged in 345 fathoms. The remainder of the collection came from the sheltered straits which separates Nipon from the Southern Islands, called the "Inland Sea," and particularly from Kobé.

A fact to which I have repeatedly drawn attention, and again quite recently in Ann. Mag. Nat Hist., 1878, vol. i. p. 385, viz., that there exists the greatest similarity between the marine fauna of Japan and that of the Mediterranean, the adjacent parts of the Atlantic, and the West Indies, is fully borne out by the Challenger collections. It is proved not only by a number of species absolutely identical in the seas named, but also by a large proportion of representative species. The similarity becomes still more obvious when we take into consideration species which live at a moderate depth of from 200 to 400 fathoms; and although I have included the descriptions of those fishes in the deep-sea series, it will be useful to enumerate them here with an indication of their geographical range. Of the nineteen species obtained at a depth of 345 fathoms, four are

identical with Mediterranean species, five are representatives of Mediterranean species, eight belong to genera with a wide range at great depths, and two only must be regarded as peculiar Japanese forms.

- |  |   |   |   |
|--|---|---|---|
| 1. <i>Centrophorus squamulosus</i> , . | } | Eight species of <i>Centrophorus</i> from the Coast of Portugal, Madeira, and Mediterranean.            |   |
| 2. <i>Centrophorus foliaceus</i> , .   |   |   |   |
| 3. <i>Beryx decadactylus</i> , .       | . | Madeira and Coast of Portugal.  |   |
| 4. <i>Polymixia japonica</i> , .       | } | One species of this genus from Madeira and St Helena.<br>One species from Cuba.                         |   |
| 5. <i>Lepidopus tenuis</i> , .         |   |   | . |
| 6. <i>Physiculus dalwigki</i> , .      | . | Madeira and St Helena.  |   |
| 7. <i>Haloporphyrus lepidion</i> , .   | . | Mediterranean, Madeira, and Coast of Portugal.  |   |
| 8. <i>Macrurus japonicus</i> , .       | } | The species of <i>Macrurus</i> and <i>Coryphænoides</i> are generally distributed over the deep sea.    |   |
| 9. <i>Macrurus macrochir</i> , .       |   |   | . |
| 10. <i>Macrurus parallelus</i> , .     |   |   | . |
| 11. <i>Coryphænoides nasutus</i> , .   |   |   | . |
| 12. <i>Coryphænoides villosus</i> , .  |   |   | . |
| 13. <i>Bathyrhissa dorsalis</i> .      | . | Peculiar to the sea off Japan.  |   |
| 14. <i>Xenodermichthys nodulosus</i> . | . | Peculiar to the sea off Japan.  |   |
| 15. <i>Gonostoma gracile</i> , .       | } | One species from the Mediterranean and Madeira, the other from the deep sea, and generally distributed. |   |
| 16. <i>Synaphobranchus pinnatus</i> ,  |   |   | . |
| 17. <i>Synaphobranchus affinis</i> .   | . | Madeira, Brazil.  |   |
| 18. <i>Nettastoma parviceps</i> ,      | . | Japan.  |   |
| 19. <i>Myxine australis</i> ,          | . | One species from the Mediterranean.   |   |
|  | . | Southern Coasts of South America.   |   |

*Trygon pastinaca*, L., Market of Yokohama.

*Myliobatis aquila*, L., Market of Yokohama.

*Percalabrax japonicus*, C. V., off Inosima, from Japanese fisher-boats; Inland Sea, from Japanese fisher-boats.

*Nippon spinosus*, C. V., Market of Yokohama.

*Serranus octocinctus*, Schleg. (= *Serranus mystacinus*, Poey.), Market at Yokohama.

*Apogon lineatus*, Schleg., Inland Sea of Japan, Yokohama Bay, 15 fathoms; Harbour of Kobé, 8 fathoms.

*Scombrops chilodipteroides*, Blkr., off Inosima, 345 fathoms.

*Haapalogenys mucronatus*, Eyd. and Soul., Harbour of Kobé, 8 fathoms.

*Chatodon modestus*, Schleg., Market of Yokohama.

*Upeneoides bensasi*, Schleg., Market at Yokohama, Kobé.

*Pagrus major*, Schleg., off Inosima, from Japanese fisher-boats, Harbour of Oosima.

*Pagrus cardinalis*, Lac., Market of Yokohama.

*Chrysophrys swinhonis*, Gthr., Inland Sea of Japan, Market of Yokohama.

*Hoplegnathus fasciatus*, Schleg., Inland Sea of Japan.

*Sebastes ventricosus*, Schleg., Market of Yokohama.

*Sebastes oblongus*, n. sp. (Pl. XVIII.).

Allied to *Sebastes inermis* and *pachycephalus*.

D.  $12\frac{1}{2}$ , A.  $\frac{3}{5}$ , L. lat. ca. 65. The height of the body is contained thrice and one-half in the total length (without caudal); the length of the head twice and three-fifths. The scales are rather irregularly arranged, and much smaller above than below the lateral line. On the upper side of the head they advance to the nostrils, very minute ones covering even the præorbital. The snout is pointed and longer than the eye, the diameter of which is one-sixth of the length of the head, and equal to the width of the flat interorbital space. None of the spines on the upper side of the head project, and those of the præoperculum are obtuse; the teeth form broad villiform bands in the jaws as well as on the vomer and palatine bones; the maxillary reaches to the vertical from the hind margin of the eye. Dorsal spines strong; the fourth to the seventh are the longest, two-fifths of the length of the head. Anal spines stronger, but much shorter than the longest of the dorsal. Brownish, marbled with darker; lower parts and all the fins with brown spots; an oblique brown streak from the præorbital towards the angle of the præoperculum. Inland Sea, Japan. Market of Yokohama.

*Sebastes joyneri*, Gthr. (Ann. and Mag. Nat. Hist., 1878, vol. i. p. 485). (Pl. XXIX. fig. A.)

D.  $1\frac{3}{5}$ , A.  $\frac{3}{7}$ , L. lat. ca. 60. The height of the body is equal to the length of the head, and one-third of the total length (without caudal); scales very thin, scarcely serrated, a little smaller above the lateral line than below it; on the upper side of the head they advance to the nostrils and cover the præorbital and maxillary. Snout short, three-fourths of the diameter of the eye, which is three-tenths of the length of the head, and exceeds by one-third the width of the interorbital space which is flat. Upper surface of head smooth, scarcely armed, the two occipital ridges very low and terminating in short spines; præorbital with two flat spines; præoperculum with five spines, the second from above being the longest, and one-third of the diameter of the eye; operculum with two spines, the upper of which is the longest. Teeth in narrow villiform bands, in the jaws, on the vomerine and palatine bones; the vomerine teeth form a triangular patch. The maxillary does not reach to the vertical from the middle of the eye. The fourth dorsal spine is the longest, contained twice and a quarter in the length of the head. Anal spines stronger than those of the dorsal, the second anal spine being shorter than the

third dorsal. Probably red in life, with five brown cross bars on the back and the dorsal fin, the three anterior ones descending a little below the lateral line. Fins immaculate. Pharynx uncoloured.

Although no specimens of this species have been obtained by the Challenger Expedition, I enumerate it here along with the other Japanese species of this genus. The two specimens, which have been quite recently discovered, are 9 inches long, and from the south-east coast of Nippon.

*Sebastes macrochir*, n. sp. (Pl. XXVII).

D.  $14\frac{1}{6}$ , A.  $\frac{3}{5}$ , P.  $17\frac{1}{5}$ , L. lat. ca. 45. The height of the body is contained thrice and one-fourth in the total length (without caudal), the length of the head two and a half times. Scales rather regularly arranged. Eye very large, one-third of the length of the head, much longer than the snout. Mouth wide, the maxillary extending to behind the middle of the eye. The bands of intermaxillary teeth are of moderate breadth, but those of the vomer, palatines, and mandible are very narrow. Interorbital space flattish, scaleless, narrow, its width being only two-fifths of the orbit. Occipital region flat, with some rudimentary scales. A series of spines runs along each side of the forehead and occiput; it consists of a spine in front of the orbit, three above it, and two on each side of the occiput. Infraorbital ridge with strong spines. Præoperculum with five pointed spines on the margin. Each ramus of the mandible with three large muciferous apertures. Dorsal spines rather feeble; the third to the sixth are the longest, two-fifths of the length of the head. Anal spines stronger, but shorter than the longest of the dorsal. Caudal truncated. The pectoral fin is extremely broad, the five or six lower rays being elongated beyond the extremity of those next above them; their extremities are somewhat thickened, and they, like the similar outer ventral rays, serve as an organ of locomotion. The pectoral rays extend to, the ventral rays beyond, the vent. The latter are as long as the head without snout.

Red, with a large black spot on the posterior half of the spinous dorsal, and with another between the anal spines. Length of specimens, 7 to 11 inches. Inland Sea of Japan. Off Inosima, 345 fathoms.

*Scorpena miostoma*, n. sp.

Allied to *Scorpena zanzibarensis* and *Scorpena longicornis*, but with a considerably narrower mouth.

D.  $11\frac{1}{16}$ , A.  $\frac{3}{5}$ , L. lat. 45. Palatine teeth; the vomerine teeth form a simple open V-shaped band. The height of the body is less than the length of the head, which is contained twice and one-third in the total length (without caudal). Head nearly entirely scaleless. Upper jaw slightly overlapping the lower. Orbital tentacles broad, fringed, shorter than the eye which equals the length of the snout. Interorbital space deeply

concave, with a pair of slight ridges within its concavity. Vertex with a quadrate depression, which is rather broader than long, and surrounded by spines. The maxillary does not extend backwards to below the middle of the eye. All the cutaneous appendages on the head, body, and fins are well developed. The fourth and fifth dorsal spines are the longest, two-fifths of the length of the head, and equal to the second of the anal fin, which, however, is stronger. Eight of the pectoral rays are branched. Body and fins marbled with the usual colours of this genus, but without any peculiar markings. The axil of the pectoral is scarcely spotted, and the lower part of the head is white. Japan. Length of specimen,  $5\frac{1}{3}$  inches. Market of Yokohama.

*Pterois lunulata*, Schleg. (probably = *Pterois volitans*, L.), Market of Yokohama.

*Tetraroge longispinis*, C. V., var. *nuda*.

In the typical form of this species the body is covered with minute but very conspicuous scales. In the following specimens the scales are so rudimentary, and in such small number, that the body appears to be almost naked. No other distinction can be made out between the scaly and naked specimens. Length of specimens,  $1\frac{1}{2}$  to  $3\frac{1}{4}$  inches, Kobé, Japan.

*Sciæna sina*, C. V., Inland Sea, Japan.

*Trichiurus lepturus*, L. (= *Trichiurus savala*, Cuv. = *Trichiurus armatus*, Gray = *Trichiurus japonicus*, Blkr.), off Inosima, 345 fathoms.

*Prionurus scalprum*, Langsd., Market of Yokohama.

*Trachurus trachurus*, L., Market of Yokohama.

*Caranx muroadsi*, Schleg., Inland Sea, Japan.

*Equula nuchalis*, Schleg., Market of Yokohama.

*Zeus japonicus*, C. V., Market of Yokohama.

*Cybium nipponium*, C. V., Inland Sea, Japan.

*Brama raii*, Bl. (this also is a new addition to the Japanese fauna), off Inosima, purchased of fishing-boats.

*Psenes anomalus*, Schleg., Market of Yokohama.

*Percis sexfasciata*, Schleg., Market of Yokohama.

*Uranoscopus asper*, Schleg., Market of Yokohama.

*Sillago japonica*, Schleg., Inland Sea, Japan.

*Latilus argentatus*, C. V., Market of Yokohama.

*Lophius setigerus*, Wahl, Yokohama, Kobé.

*Platycephalus insidiator*, Forsk., Yokohama Bay, Inland Sea of Japan.

*Platycephalus punctatus*, C. V., Inland Sea, Japan.

*Platycephalus rudis*, n. sp. (Pl. XXIX. fig. B).

D.  $1\frac{1}{8}/11$ , A. 11, L. lat. ca. 70. The length of the head is one-third of the total



(without caudal), and its width between the præopercular spines is more than one-half of its length. All the bones on the upper surface, and the scales covering its sides, are rough. The space between the eyes is concave, its width being one-half of the vertical diameter of the eye. Superciliary edge serrated; ridges with distant spines along the infraorbital and above the operculum, the central ridges of the crown of the head being rather obscure. Opercular ridge not serrated. Three spines at the angle of the præoperculum, the lower of which is the smallest, the upper the longest, but only half the length of the eye. Only the foremost part of the lateral line is spiny. Ventral fins reaching to the anal. Greyish, with black dots on the trunk and operculum. The spinous dorsal and ventral black, the second dorsal and pectoral, with blackish dots. Caudal irregularly marbled with blackish. Length of specimen,  $7\frac{1}{4}$  inches. Market of Yokohama.

*Lepidotrigla microptera*, Gthr. (Ann. and Mag. Nat. Hist., 1873, vol. xii. p. 241),  
Inland Sea, Japan.

*Gobius yokohamæ*, n. sp.

D. 6/11, A. 11, L. lat. 26. The height of the body is contained four and a half times in the total length (without caudal), the length of the head thrice and three-fourths. Snout obtuse, as long as the eye, the diameter of which is more than one-fourth of the length of the head. Eyes very close together; mouth oblique, with the jaws subequal in front, reaching to below the front margin of the eye; a very small canine tooth on each side of the lower jaw; head and occiput naked, but nape covered with small scales. A wide porus in front and behind the interorbital space, and two others behind the eye; they are the openings of the muciferous channels. Seven longitudinal series of scales between the second dorsal and the anal. The ventral fin terminates at some distance from the vent, which is midway between the root of the caudal and the præoperculum. Dorsal fins rather lower than the body; caudal slightly pointed, as long as the head. Light brownish olive, with a series of five brown spots along the lower half of the body, the last being on the root of the caudal and the most distinct; a triangular black spot occupies the lower angle of the operculum; gill-membrane on the throat blackish.

Small as this species is, it is adult, a female having the ovaries fully developed. Length of specimen,  $2\frac{1}{2}$  inches. Yokohama Bay; 15 fathoms. Inland Sea of Japan.

*Gobius hexanema*, Blkr., Yokohama Bay, 15 fathoms, Inland Sea, Japan, Kobé.

*Gobius flavimanus*, Schleg., Market of Yokohama.

*Trypauchen vagina*, Bl. Schn., Kobé, 8 fathoms.

*Callionymus lunatus*, Schleg. (Faun. Japon. Poiss., p. 155, pl. lxxviii. fig. 4).

D. 4/9, A. 9, C. 10. Præopercular spine rather shorter than the eye, terminating

in four small hooks, three of which are directed upwards, the fourth being on the outer side of the spine and pointing forward. The *females* have the first dorsal spine prolonged into a much shorter filament than the males, but all have the large black sublunate spot between the third and fourth dorsal spines. Caudal fin with rather distant small black drops arranged longitudinally; caudal fin but little longer than the head, obtusely rounded. In the *males* the dorsal spines and caudal rays are much prolonged, and the greater portion of the first dorsal fin is whitish, with large ovate black spots. Length of specimens, 2 to 6 inches. Inland Sea, Japan. Yokohama Bay; 15 fathoms. Kobé.

*Chirus hexagrammus*, Pall., Inland Sea, Japan, Market of Yokohama.

*Agrammus schlegeli*, Gthr., Market of Yokohama.

*Centronotus nebulosus*, Schleg., Inland Sea, Japan, Market of Yokohama.

*Mugil joyneri*, Gthr. (Ann. and Mag. Nat. Hist., 1878, vol. i. p. 486).

D.  $4\frac{1}{3}$ , A.  $\frac{3}{8}$ , L. lat. 40, L. transv. 14. The height of the body is less than the length of the head, which is two-ninths of the total (without caudal). Eye small; its diameter is one-seventh, the width of the interorbital space more than one-third of the length of the head. Adipose eyelid none; præorbital emarginate and denticulated; snout longer than the orbit; extremity of the maxillary visible. There are eighteen scales between the snout and the origin of the spinous dorsal; no elongate scale in the axil. Dorsal fins equal in height; the spines are rather slender, the length of the first being rather more than three-fourths of the postorbital part of the head; it is much nearer to the end of the snout than to the base of the caudal fin. The first two rays of the soft dorsal are scaly, the rest of the fin being devoid of scales; anal scaly anteriorly, as high as the soft dorsal, and commencing in advance of that fin. Caudal notched, one-seventh of the total length. Pectoral two-thirds of the length of the head. Axil without spot.

This species was not contained in the Challenger collection, but may be enumerated here for completeness' sake. It was discovered by Mr H. B. Joyner at Tokei. The specimens are 12 inches long.

*Fistularia serrata*, Cuv. (Pl. XXXII. fig. C).

*Fistularia serrata*, Cuv., Gthr., Fish., vol. iii. p. 533.

Dr Steindachner has recently directed my attention to certain differences in the sculpture of the head which he observed in a small series of examples from Japan, and the constancy of which I have been able to confirm in the series in the British Museum. It appears that two species were confounded by previous authors, and none of the various names used by them were given with the intention of distinguishing those two species;

so that it is impossible to say to which of them the names *serrata*, *immaculata*, and *commersoni* apply. Dr Steindachner and myself have agreed to treat those names as synonyms, and to leave the term *serrata* to the deeply-sculptured form, of which a full description is given in the "Catalogue of Fishes." This species may be characterised thus :—

Interorbital space concave; the two middle ridges on the upper surface of the snout, run close and parallel to each other along the anterior half of the length of the snout. Body moderately depressed with minute asperities, which render the skin rough to the touch.

The British Museum series includes specimens from Aden, Madras, Penang, Singapore, Bengal, China, Formosa, New South Wales, and from Bermuda (Mr J. Matthew Jones). It reaches a length of nearly 5 feet. Length of specimens, 20 and 23 inches. Yokohama.

*Fistularia depressa*, n. sp. (Pl. XXXII. fig. D).

Bones of the head less deeply sculptured than in *Fistularia serrata*, but with the upper lateral edges of the snout likewise serrated. Interorbital space nearly flat. The two middle ridges on the upper surface of the snout are not very close together, and diverge again on the anterior half of the length of the snout, converging finally on the foremost part. Body much depressed, nearly smooth, the asperities of the skin being scarcely perceptible.

The British Museum series contains specimens from Natal, Zanzibar, Amboyna, China, New Guinea, New South Wales, Fiji Islands, and California. This species attains to the same length as *Fistularia serrata*. Length of specimen, 24 inches. Sulu Archipelago. Station 200; 255 fathoms.

I am inclined to doubt the occurrence of this shore fish at so great a depth as 250 fathoms, and it does not seem to me to be improbable that this specimen got into the trawl when near to the surface of the water.

*PlatyGLOSSUS pæciLOPTERUS*, Schleg., Inland Sea of Japan, Market at Yokohama.

*PlatyGLOSSUS pyrRHOGRAMMA*, Schleg., Market at Yokohama.

*PseudORHOMBUS olivACEUS*, Schleg., Inland Sea, Japan.

*Hippoglossus olivaceus*, Schleg., Faun. Japon. Poiss., p. 184, tab. xciv.

*Pseudorhombus olivaceus*, Gthr., Fishes, vol. iv. p. 429.

*PseudORHOMBUS pentOPHTHALMUS*, Gthr., Inland Sea, Japan.

*PleurONECTES variegATUS*, Schleg., Market of Yokohama.

*PleurONECTES yokOHAMÆ*, n. sp.

D. 68–72. A. 52. The height of the body is contained twice and one-sixth in the

total length (without caudal), the length of the head four times. Snout shorter than the eye, the diameter of which is one-fifth of the length of the head; lower jaw prominent; maxillary as long as the eye; the upper jaw with a series of fifteen truncated teeth on the blind side, none on the other; eyes separated by a very narrow space covered with rudimentary scales. Scales small, cycloid, imbricate, larger about the lateral line than elsewhere; the anterior curve of the lateral line is strong in the adult specimen, but much more open in the young one; its width equals the length of the pectoral; pectoral more than half as long as the head; ventrals entirely separate; fin-rays smooth; the dorsal commences immediately behind the front margin of the orbit. The free portion of the tail much higher than long. Gill-rakers very short; about ten on the first branchial arch. Blackish-brown, uniform, or indistinctly mottled with darker. In the young specimen the rays of the vertical fins are dotted with brown, five or six of them, of the dorsal as well as of the anal, having a broad black ring. In the adult example those fin rays are uniformly coloured, only traces of the dark rings being still visible. Length, 12 inches. Inland Sea, Japan. Yokohama Bay; 15 fathoms.

*Parophrys cornuta*, Schleg., Inland Sea, Japan, Kobé.

*Platessa cornuta*, Schleg., Faun. Japon. Poiss., p. 179, pl. xcii. fig. 1.

*Parophrys cornuta*, Gthr., Fish., vol. iv. p. 455.

*Cynoglossus interruptus*, n. sp. (Pl. XXX. fig. B).

D. 106, A. 77-85, L. lat. 78. Two lateral lines on the left side, the upper of which is discontinued at the end of the anterior third of the body. The lateral lines are separated at the point of their greatest distance by twelve longitudinal series of scales. No lateral line on the blind side. Two nostrils, one immediately in front of the eyes, the other above the middle of the upper lip. Eyes close together, the upper somewhat in advance of the lower. Lips not fringed. The angle of the mouth is below the middle of the eye, much nearer to the extremity of the snout than to the gill-opening. The rostral hook terminates below the symphysis of the mandibles. The height of the body is contained thrice and three-fourths in the total length, the length of the head five times and one-third. Brownish, irregularly speckled with brown. Fin-rays dotted with brown. Length of specimens, 6 inches. Market at Yokohama.

*Cynoglossus joyneri*, Gthr. (Pl. XXX., fig. A.), (Ann. and Mag. Nat. Hist., 1878, vol. i. p. 486).

D. 106-107, A. 79, L. lat. 85. Three lateral lines on the left side; on the level of the end of the abdominal cavity the upper and lower lines are separated from the middle by thirteen rows of scales; four series of scales between the dorsal fin and the upper lateral line, and four between the anal and lower lateral line. No lateral line on

the right side. All the scales on the left side strongly ctenoid; those of the blind side are nearly smooth on the anterior half of the body, and more conspicuously serrate on the posterior. One nostril situated between the eyes, the other above the lip. Eyes very small, the upper slightly in advance of the lower; interorbital space equal to the width of the orbit. Snout contained twice and two-thirds in the length of the head. Angle of the mouth much nearer to the end of the snout than to the hind margin of the gill-cover behind the eye. Tail not much elongate. The height of the body is two-sevenths of the total length (without caudal), the length of the head two-elevenths. Brownish, mottled with darker.

This species has been recently discovered by Mr H. B. Joyner at Tokei, and is introduced here for comparison with the preceding species. The specimens collected are  $9\frac{3}{4}$  inches long.

*Silurus asotus*, L., Lake Hakou.

*Saurida tumbil*, Bl., Inland Sea of Japan.

*Harpodon microchir*, Gthr. (Ann. and Mag. Nat. Hist., 1878, p. 487).

D. 14, A. 14, V. 9. This gigantic species of *Harpodon* differs from *Harpodon nehereus* in having a second distinct band of palatine teeth within the first one, and in having the pectoral fin very short. The tubes of the lateral line are narrow and elongate; the basal half of the adipose fin is covered with scales. The interior of the mouth and gill-cavity is black.

A single specimen, 27 inches long, was obtained by Mr H. B. Joyner at Tokei. To judge from the structure of its skeleton, and from its evident rarity, it seems to descend to a moderate depth.

*Salmo macrostoma*, n. sp. (Pl. XXXI. fig. A).

B. 12, D. 13, A. 14, L. lat. ca. 130. This fish is distinguished by its remarkably pointed snout, the upper jaw being rather the longer, and by its wide oblique mouth, the narrow and slightly-curved maxillary extending considerably behind the hind margin of the orbit. The head is small, only one-fourth of the total length (without caudal). Eye small, nearly one-seventh of the length of the head. Teeth rather small; one pair on the head of the vomer is followed by three or four other small teeth, arranged in a series. Præoperculum crescent-shaped, without lower limb. Body rather deep, its depth being equal to the length of the head. There are sixteen or seventeen scales in a series obliquely descending from behind the adipose fin to the lateral line. Dorsal fin but little higher than long. Caudal fin deeply emarginate, silvery, with nine parr marks along the lateral line, and with several round spots above and below them on the sides.

This fish is in many respects very similar to one figured by Brevoort in United States

“Narrative of an Expedition to China and Japan,” vol. ii., Fish., p. 277, pl. x. fig. 1. Unfortunately our specimen is eviscerated, so that nothing can be said as regards its anatomy. Length of specimen, 11 inches. Yokohama Market.

*Aulopus japonicus*, n. sp.

D. 15, A. 9, L. lat. 43, L. transv.  $4\frac{1}{2}/6$ . The length of the head is contained thrice and one-fourth in the total (without caudal). The diameter of the eye equals the length of the snout, and is contained thrice and two-thirds in the length of the head. Interorbital space concave, one-half of the width of the eye. Maxillary extending to behind the middle of the eye. Body irregularly marbled with blackish. Length of specimen,  $7\frac{1}{4}$  inches. Market of Yokohama.

*Plecoglossus altivelis*, Schleg., Tokaido.

*Salanx microdon*, Blkr., Market at Yokohama

*Hemirhamphus sajori*, Schleg., Market of Yokohama.

*Cyprinus auratus*, L., Yokohama, Japan.

*Leuciscus hakuensis*, n. sp. (Pl. XXXI. fig. B).

D. 10, A. 10, L. lat. 73, L. transv. 15/14. The height of the body is one-fourth of the total length (without caudal), the length of the head two-ninths. The diameter of the eye is one-fifth of the length of the head, and nearly two-thirds of the length of the snout or of the width of the interorbital space. The head is remarkably small, with narrow pointed snout, the cleft of the mouth being oblique and not reaching to the front margin of the eye. Upper jaw overlapping the lower. Origin of the dorsal fin above the root of the ventrals, midway between the snout and the root of the caudal fin; fins generally small and short, the pectoral being not much more than one-half of its distance from the ventral. Scales very indistinctly striated; there are eight longitudinal series between the lateral line and ventral fin. Pharyngeal teeth  $5/2$ , pointed. Coloration uniform.

This species is infested by a large *Ligula*, like so many other Cyprinoids of the Old World. Length of specimens,  $7\frac{1}{2}$  and  $9\frac{1}{2}$  inches. Lake Hakou, Japan.

*Achilognathus melanogaster*, Blkr., Lake Bioa.

*Misgurnus anguillicaudatus*, Cant., Kiyoto. (The Japanese fed *Sieboldia* in captivity on this fish, and said it was its natural food.)

*Engraulis japonica*, Houtt.

(1) *Atherina japonica*, Houttuyn, Verh. Holl. Maatsch. Wet. Haarlem, vol. xx. p. 340, pt. 2, 1781.

*Engraulis japonica*, Schleg., Faun. Japon. Poiss., p. 239, pl. cviii. fig. 3.

When I described specimens from the Coast of China under the name of *Engraulis*

*japonica*, I had overlooked that a fish of the same genus had been described under the same name in the "Fauna Japonica." These two fishes prove to be distinct, the Japanese species having D. 13-14 and A. 17, whilst the fin formula of the Chinese species is D. 17, A. 22. Houttuyn gives much too little descriptive detail to show what species he had before him; but as his specimens were also Japanese, his *Atherina japonica* is better referred to the species described by Schlegel; thus, the specimens described by me in Fish., vol. vii. p. 390, require a distinct name, *Engraulis chinensis*. Length of specimens,  $3\frac{1}{2}$  to 5 inches. Inland Sea, Japan. Kobé.

*Conger marginatus*, Val., Inland Sea of Japan. (Tail mutilated.)

*Congromuræna anago*, Schleg., Market of Yokohama.

*Congromuræna megastoma*, n. sp.

The length of the head is two-thirds of that of the trunk, the tail being longer than the body; upper jaw much projecting beyond the lower, rather pointed; mouth extending far behind the middle of the eye, which is large, two-ninths or one-fifth of the length of the head, and nearly two-thirds of that of the snout; posterior nostril a wide, round, open aperture; length of the pectoral fin one-third of that of the head; the dorsal commences above the root of the pectoral; vertical fins with a light margin; terminal portion of the tail black, extremity of the fin white.

	Spec. $15\frac{1}{2}$ in.	Spec. 11 in.
Distance of the snout from the root of the pectoral, . . . .	2 in. 4 lines.	1 in. 10 lines.
Distance of the snout from the vent, . . . . .	6 ,, 2 ,,	4 ,, 8 ,,
Length of tail, . . . . .	9 ,, 4 ,,	6 ,, 6 ,,

Length of specimens, 11 to 19 inches. Off Inosima, from Japanese fisher-boats.

*Murænesox cinereus*, Forsk., Kobé.

*Tetrodon oblongus*, Bl., Inland Sea, Japan, Kobé.

*Tetrodon pardalis*, Schleg., Market of Yokohama.

*Tetrodon rubripes*, Schleg., Inland Sea of Japan, Market of Yokohama.

*Monocanthus septentrionalis*, Gthr. (Ann. and Mag. Nat. Hist., 1874, vol. xiii. p. 158),

Inland Sea, Japan.

*Monocanthus modestus*, n. sp.

D. 36, A. 34. Skin velvety, without spines or bristles on the tail; the height of the body is contained thrice and three-fourths in the total length (without caudal); upper

profile of the head convex; the gill-opening extends downwards to the level of the middle of the root of the pectoral. The dorsal spine is inserted above the posterior third of the eye, and scarcely half as long as the head, or as its distance from the second dorsal fin; it is armed with four series of very small barbs, the two front series being very close together. The anterior half of the dorsal and anal fins elevated somewhat higher than the dorsal spine; ventral spine fixed. Uniform brownish-grey; caudal blackish, with the interradial membrane whitish and without any cross bands. Length of specimen, 12 inches. Inland Sea, Japan.

*Monacanthus setifer*, Benn., Market at Yokohama.



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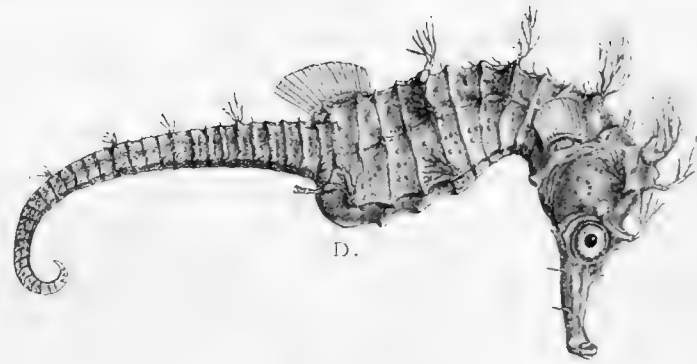
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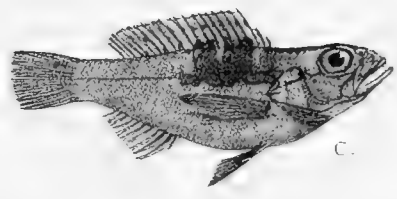
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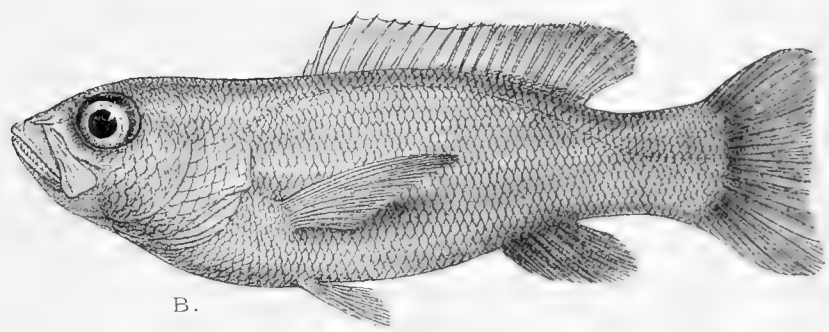




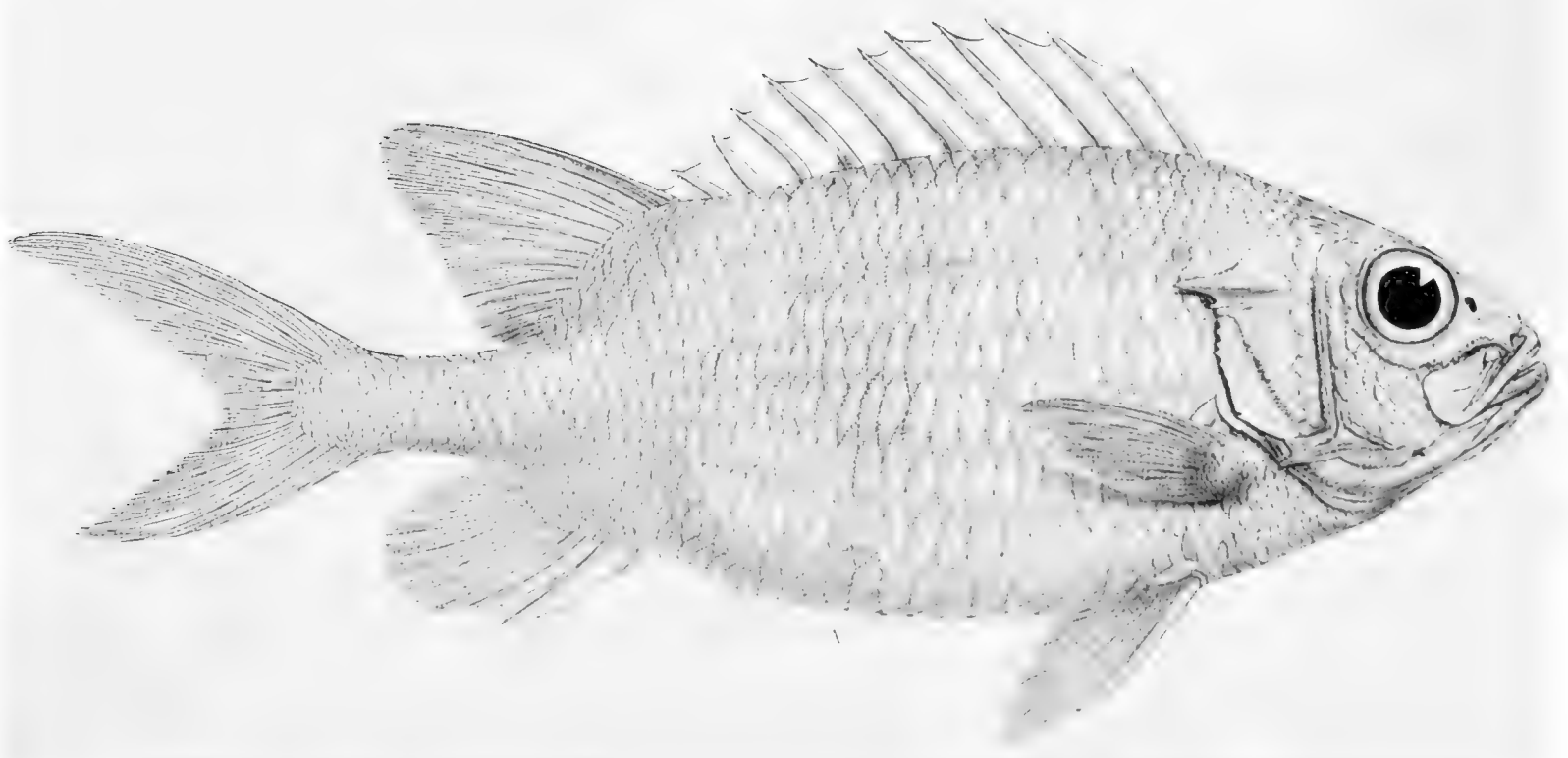
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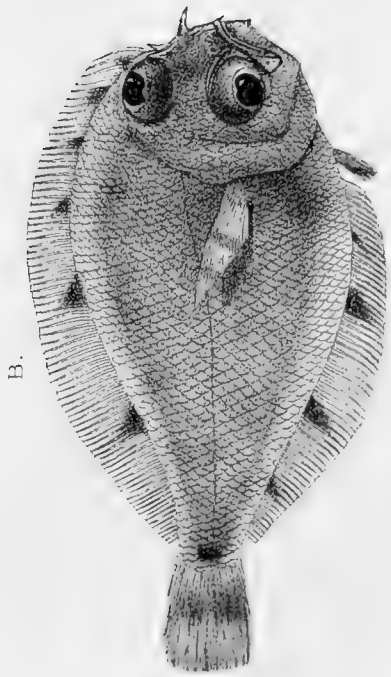
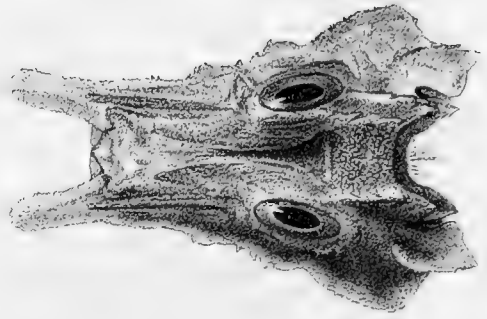
B.



A HOLOCENTRUM SANCTI PAULI.

B. BATHYANTHIAS ROSEUS. C. CENTROPRISTIS ANNULARIS. D. HIPPOCAMPUS VILLI.

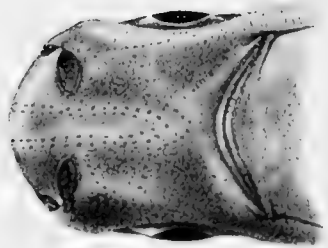




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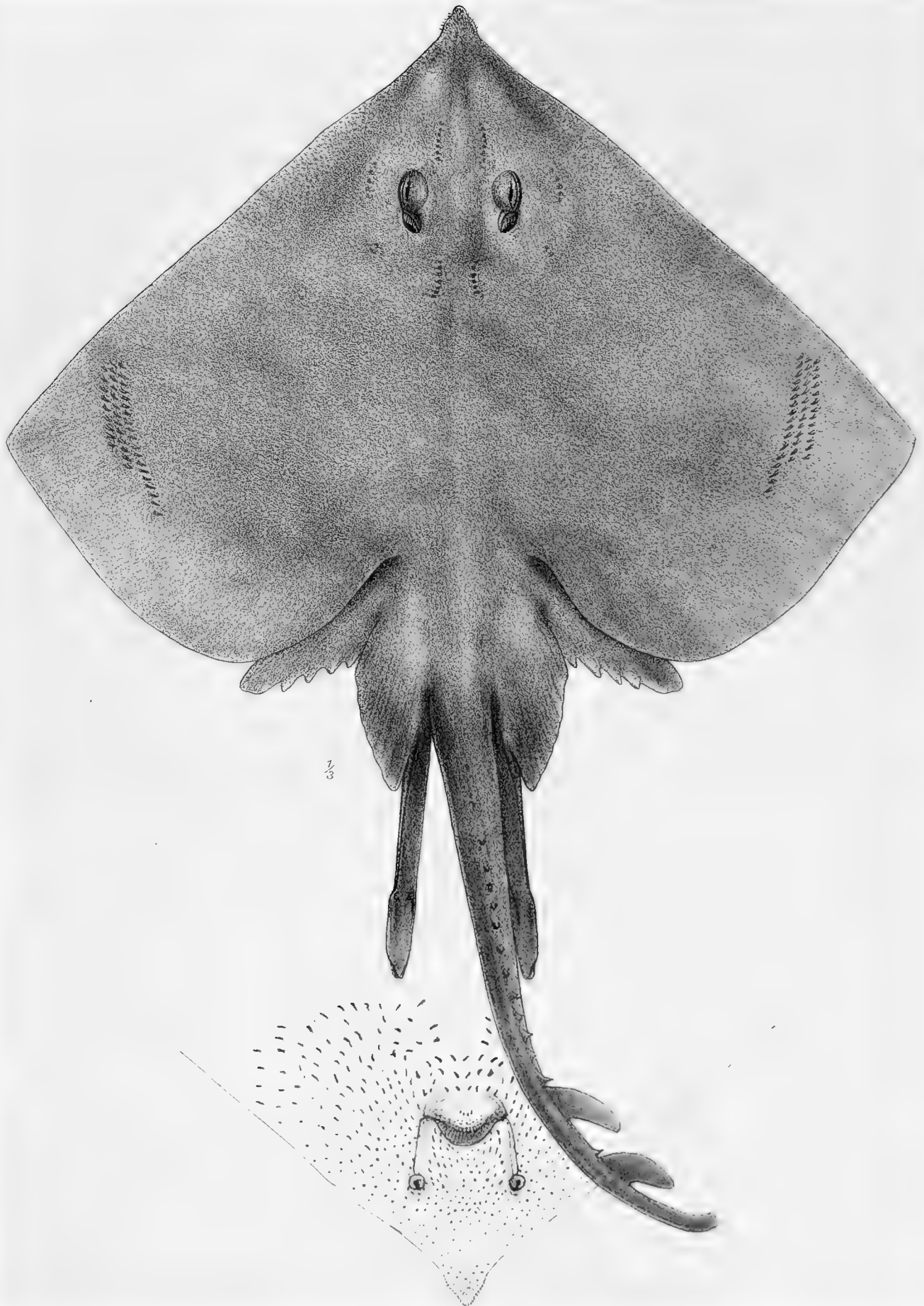


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C.



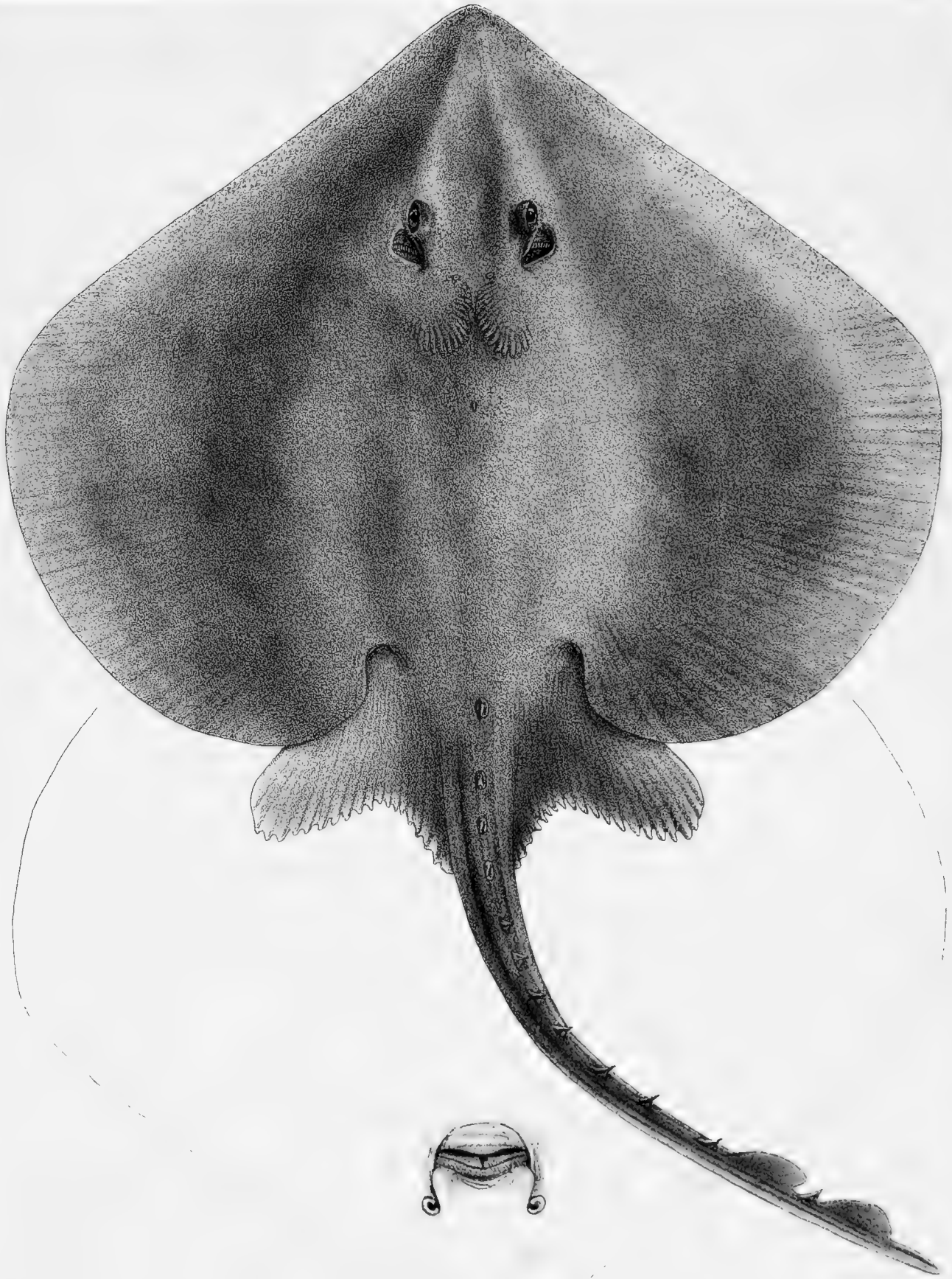


R. Minter del et lith.

RAJA PLACINA.  
(Mouth of the female.)

Fig. 100.





R. Minter del.

RAJA MICROPS.  
*Mouth of the Raja microps*

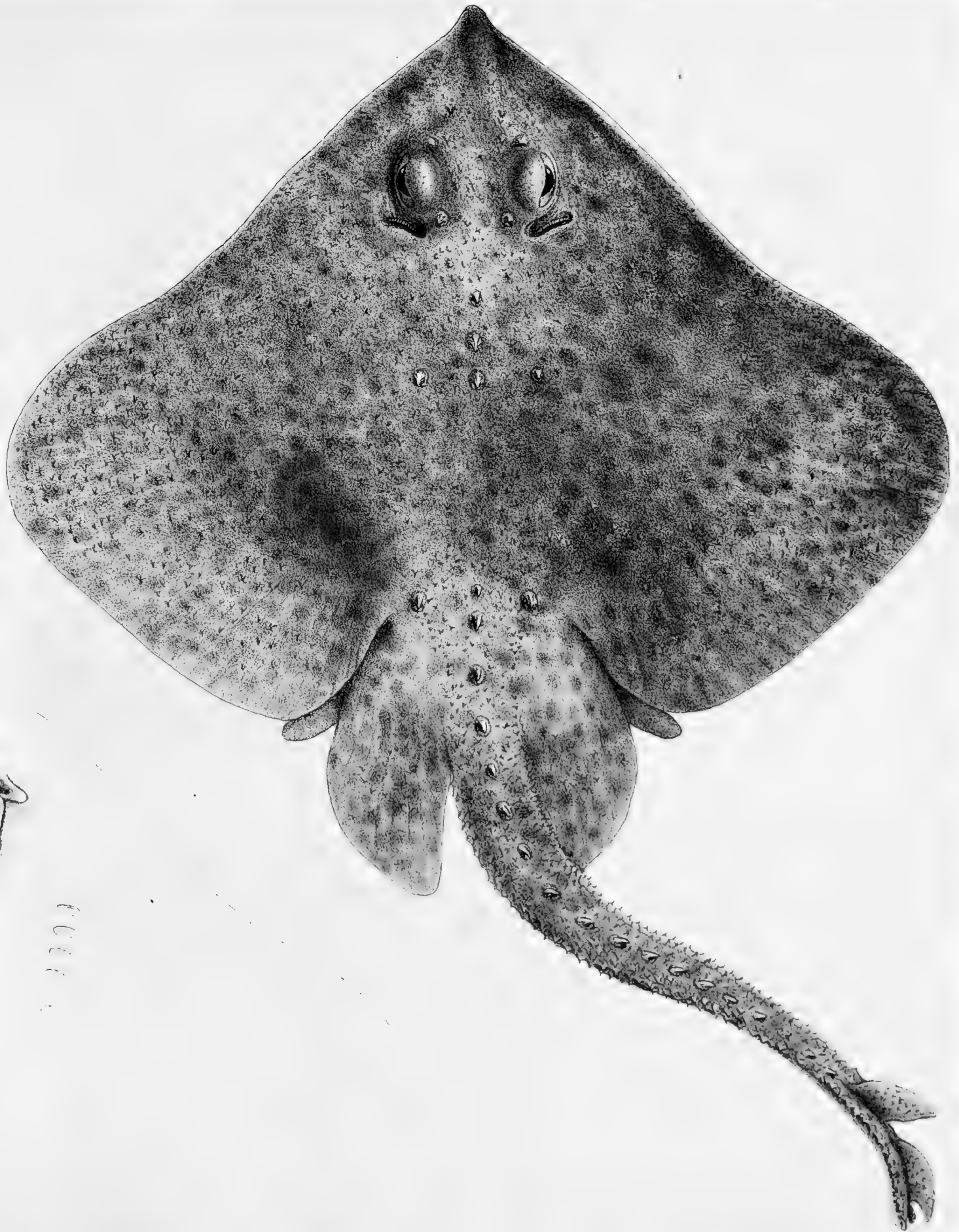
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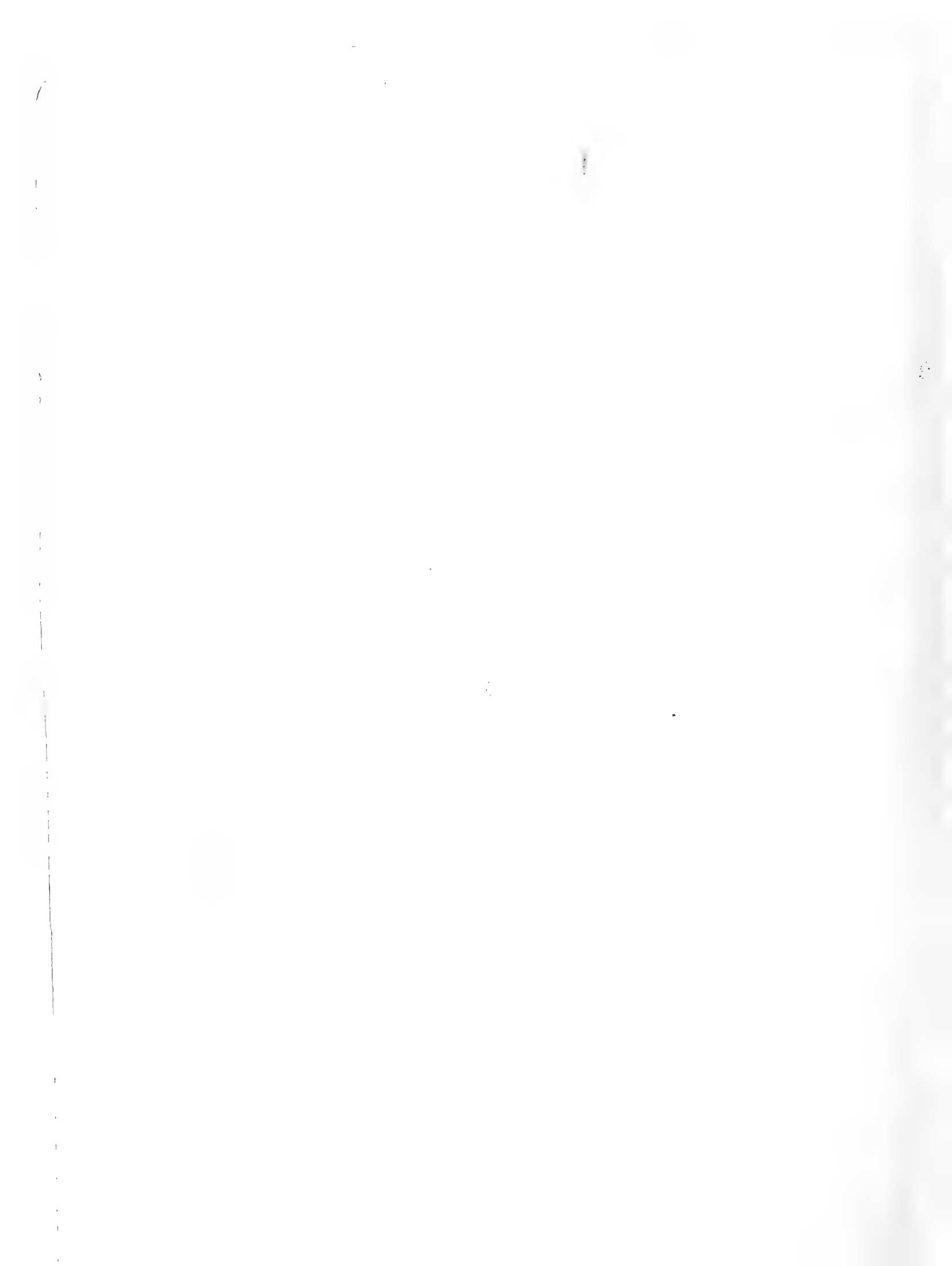


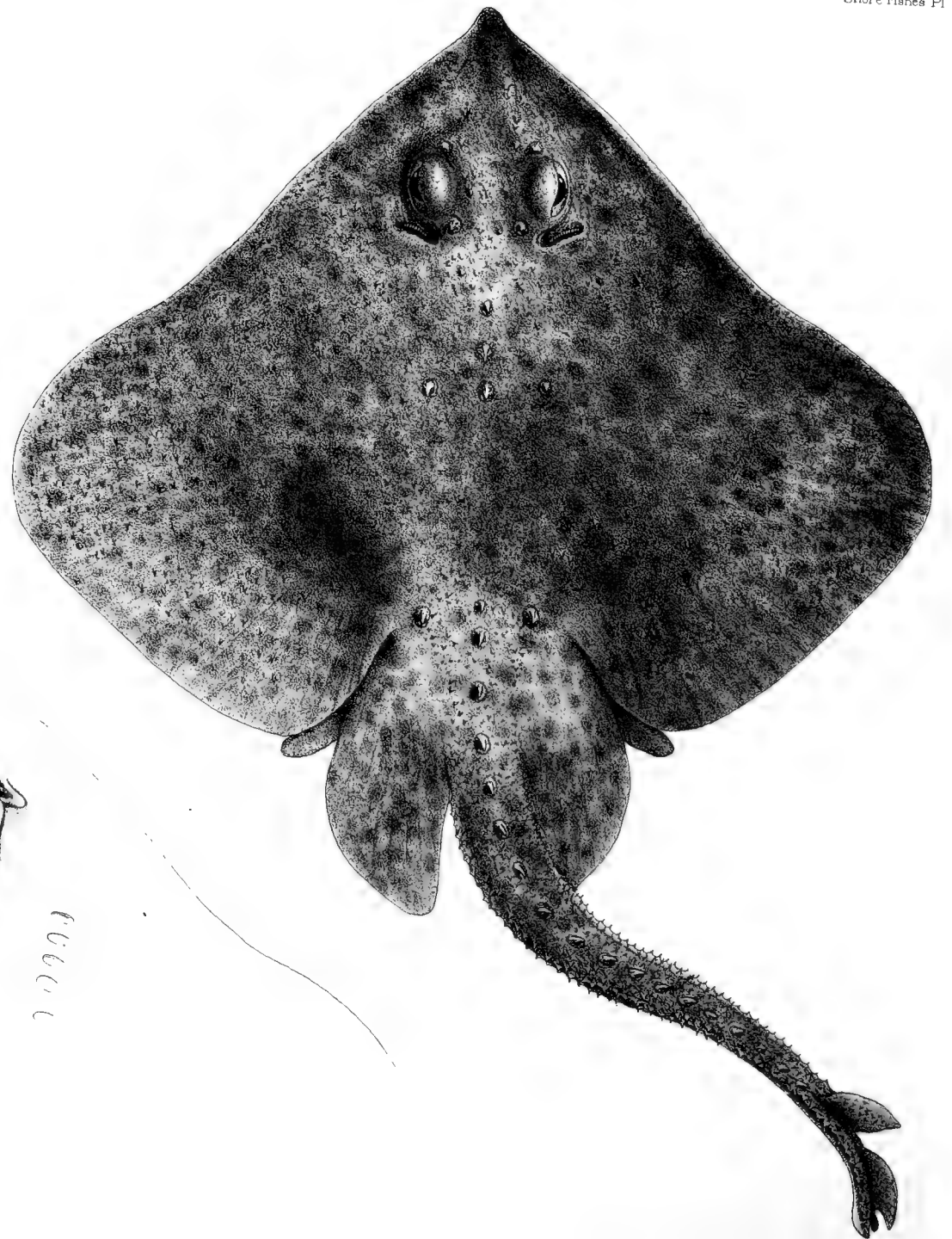
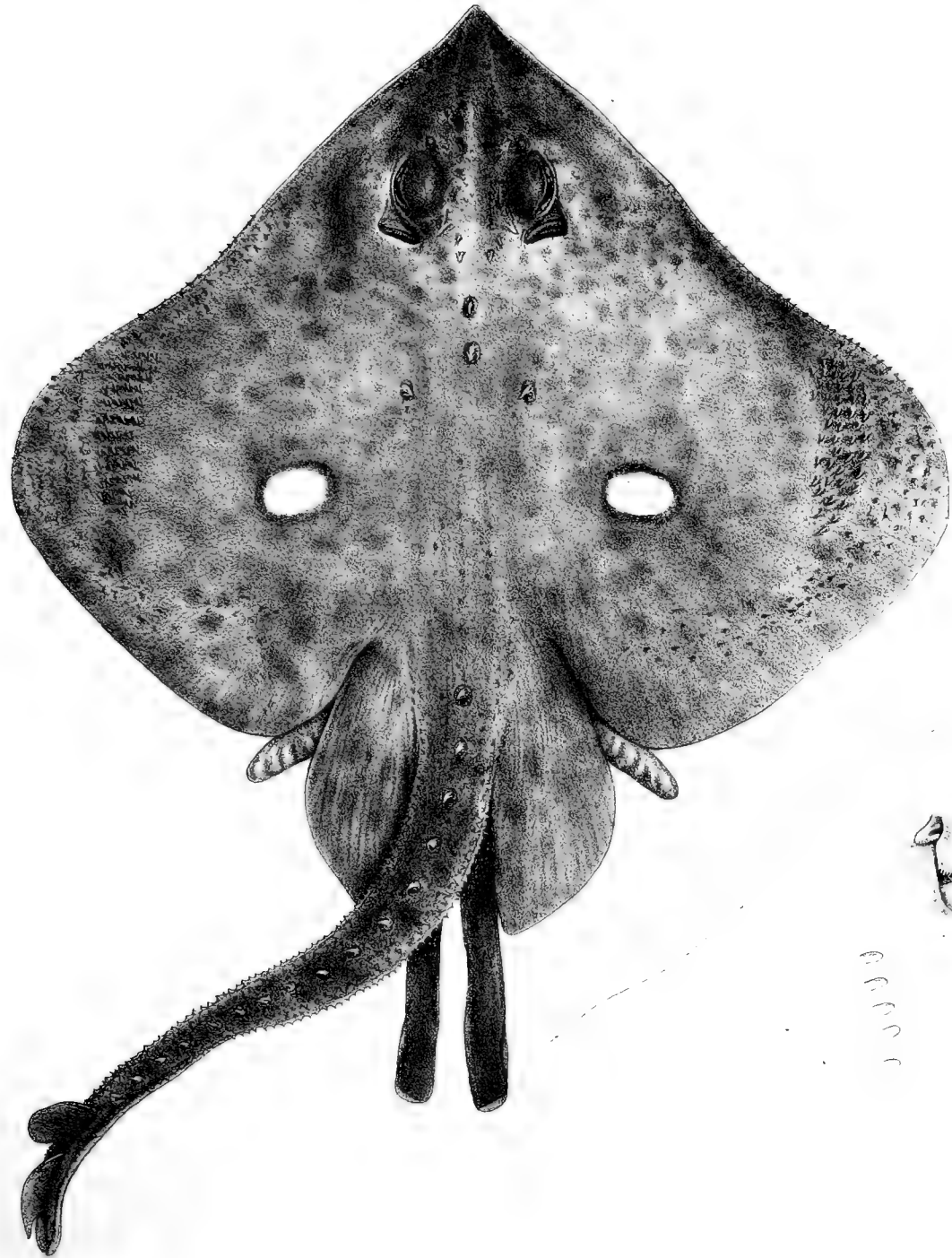




RAYI.  
ed.

Museo. Napoli





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R. Münster del

RAJA MURRAYI.  
(Kerguelens Lard.)

Mintern Bros imp.

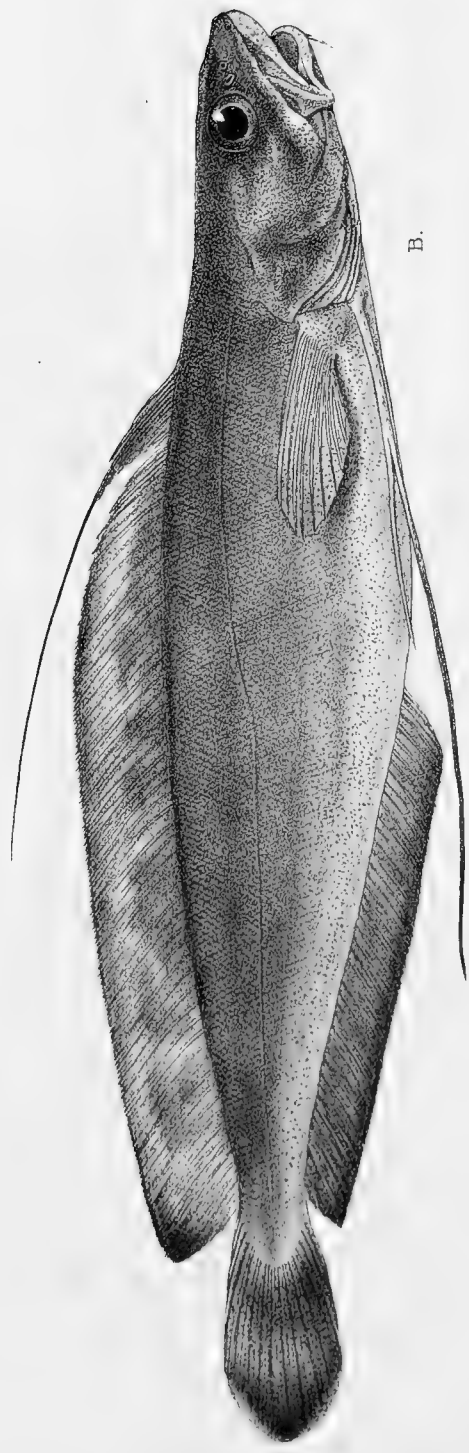




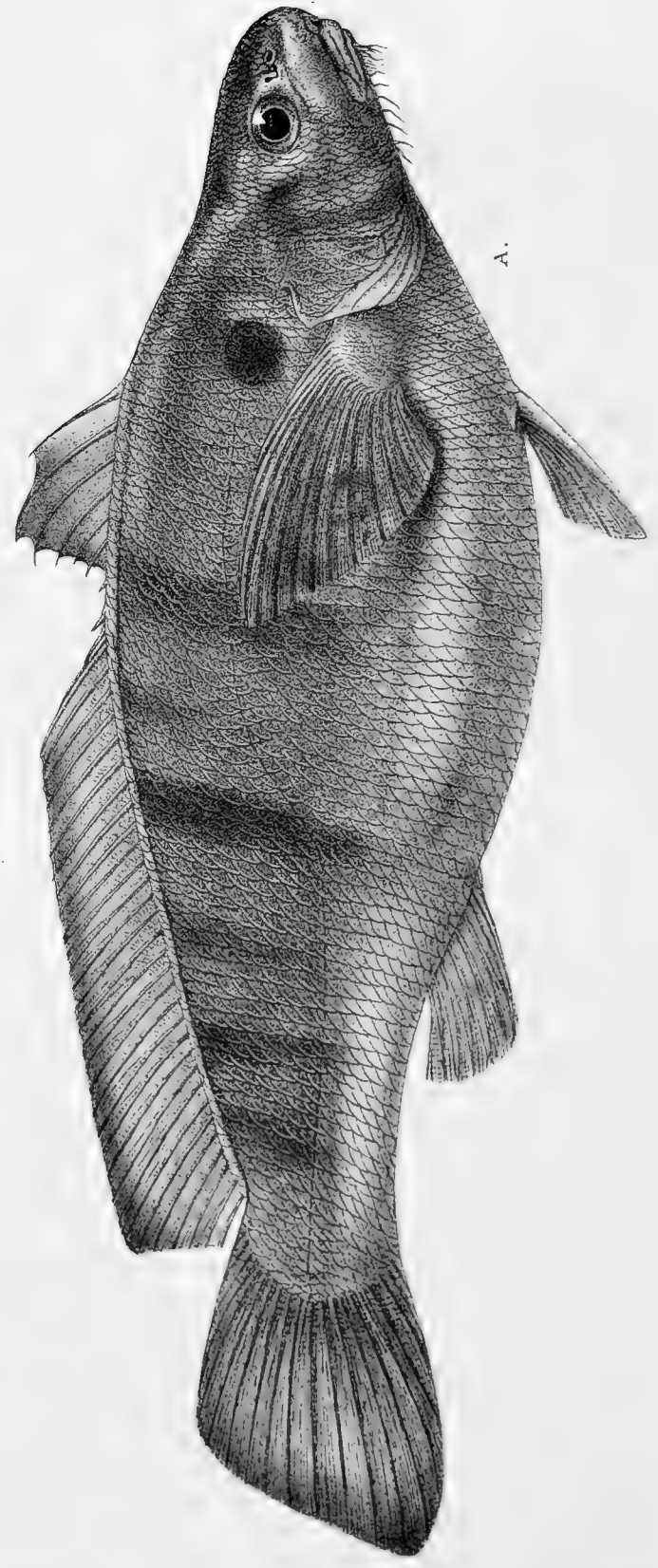
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B.



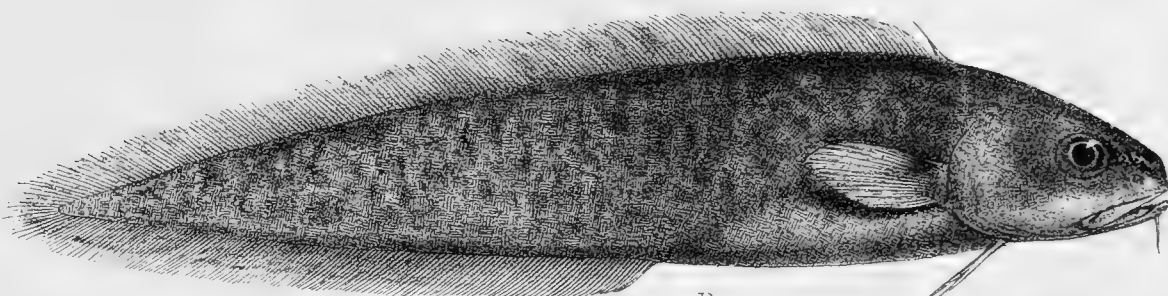
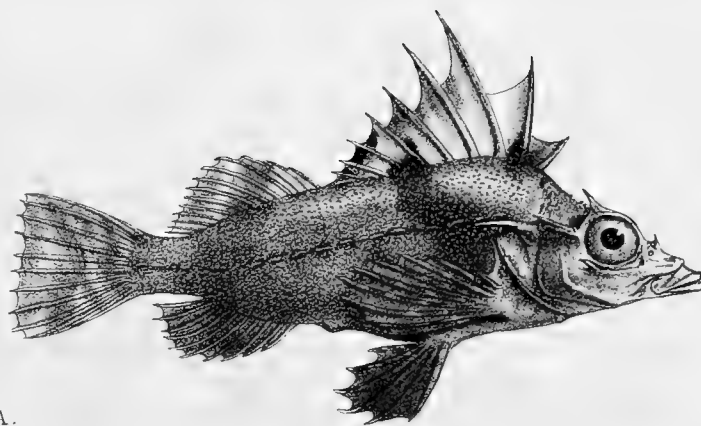
A.

A. MICROPOGON ORNATUS. B. LEMMONEMA LONGIFILIS.  
 (Mouths of the Rio de la Plata.)

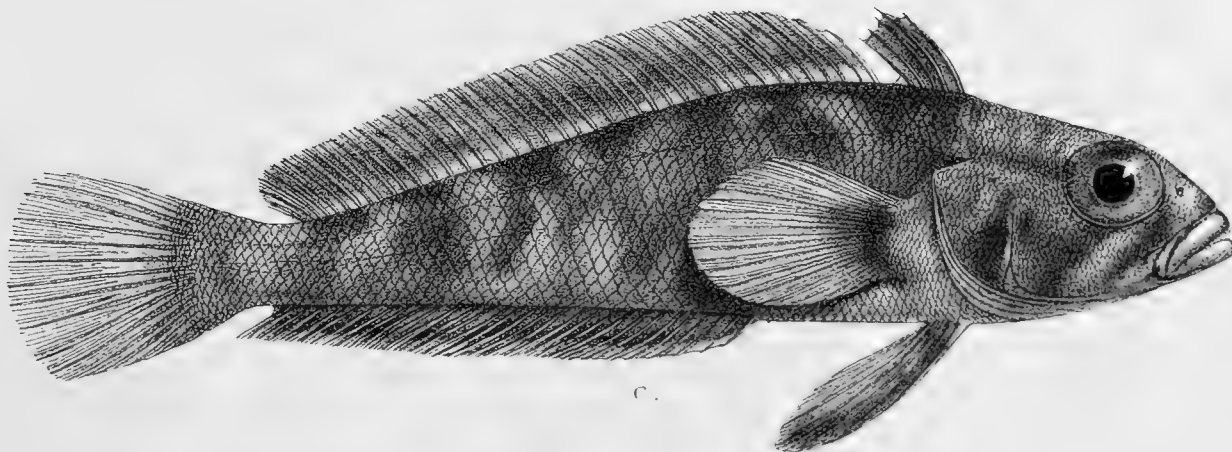




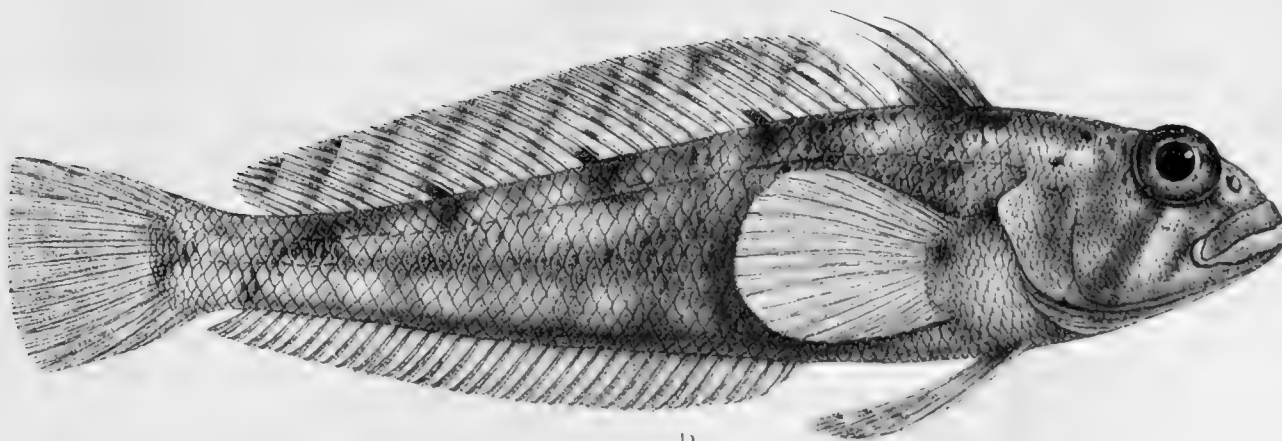
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B.



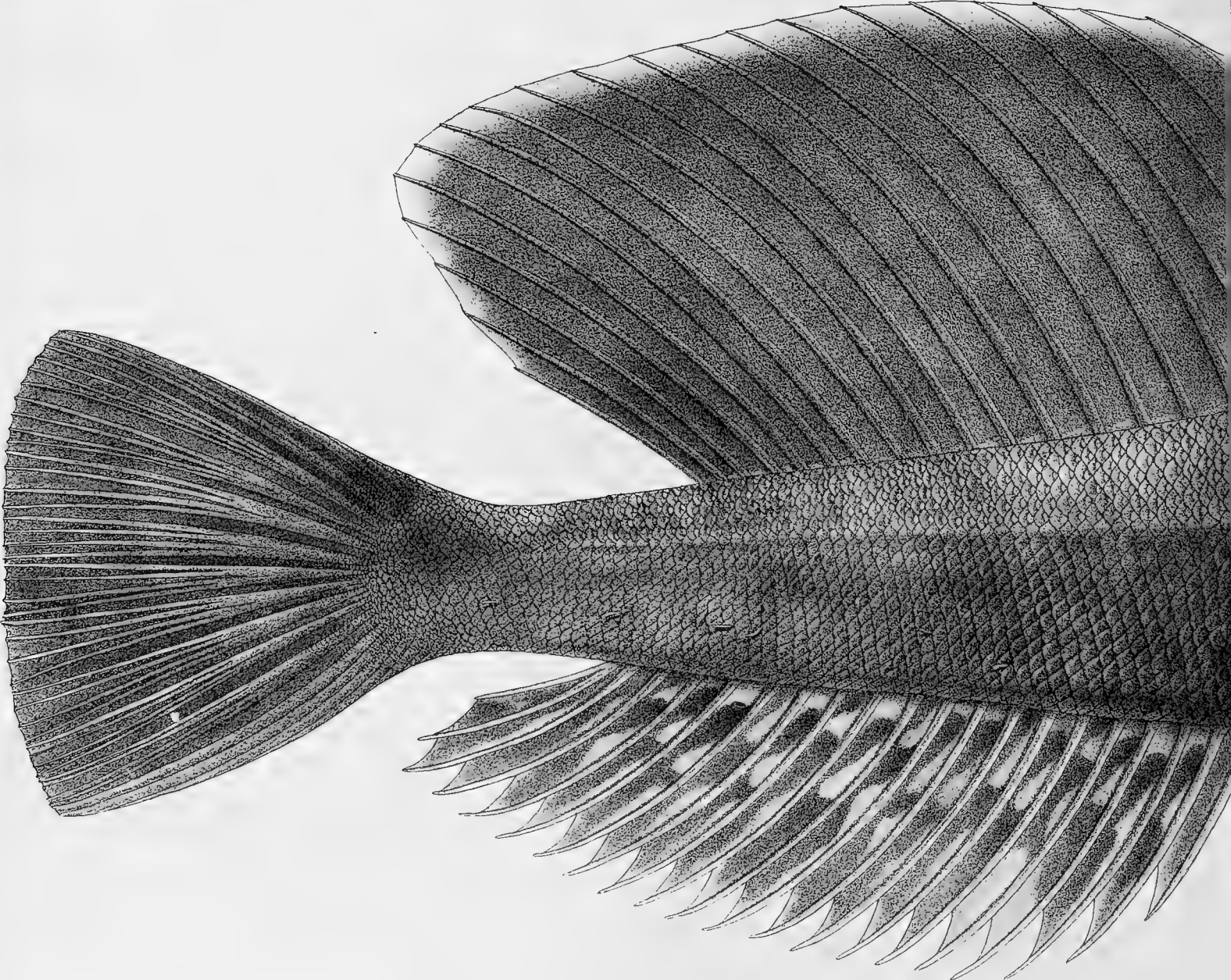
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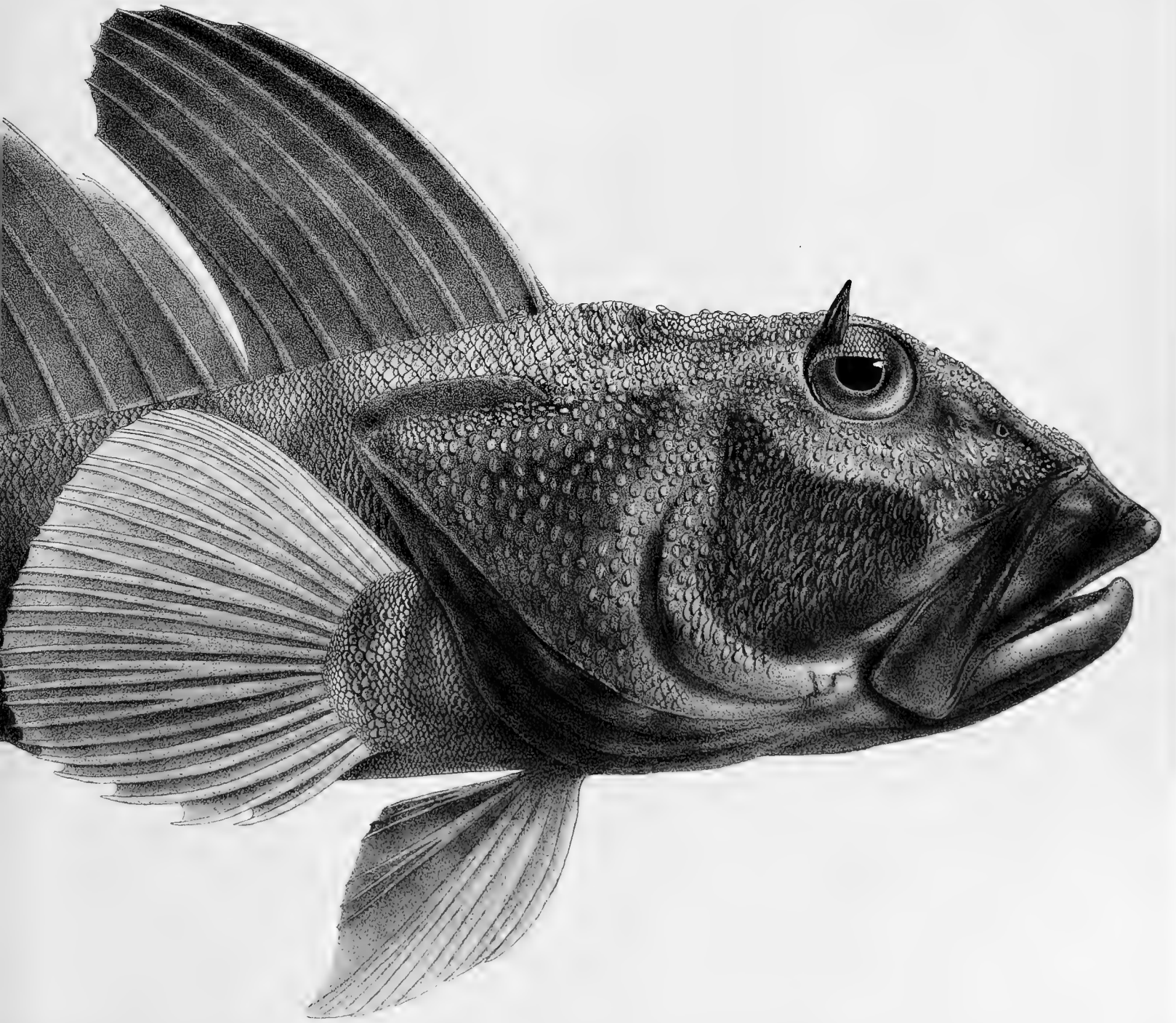


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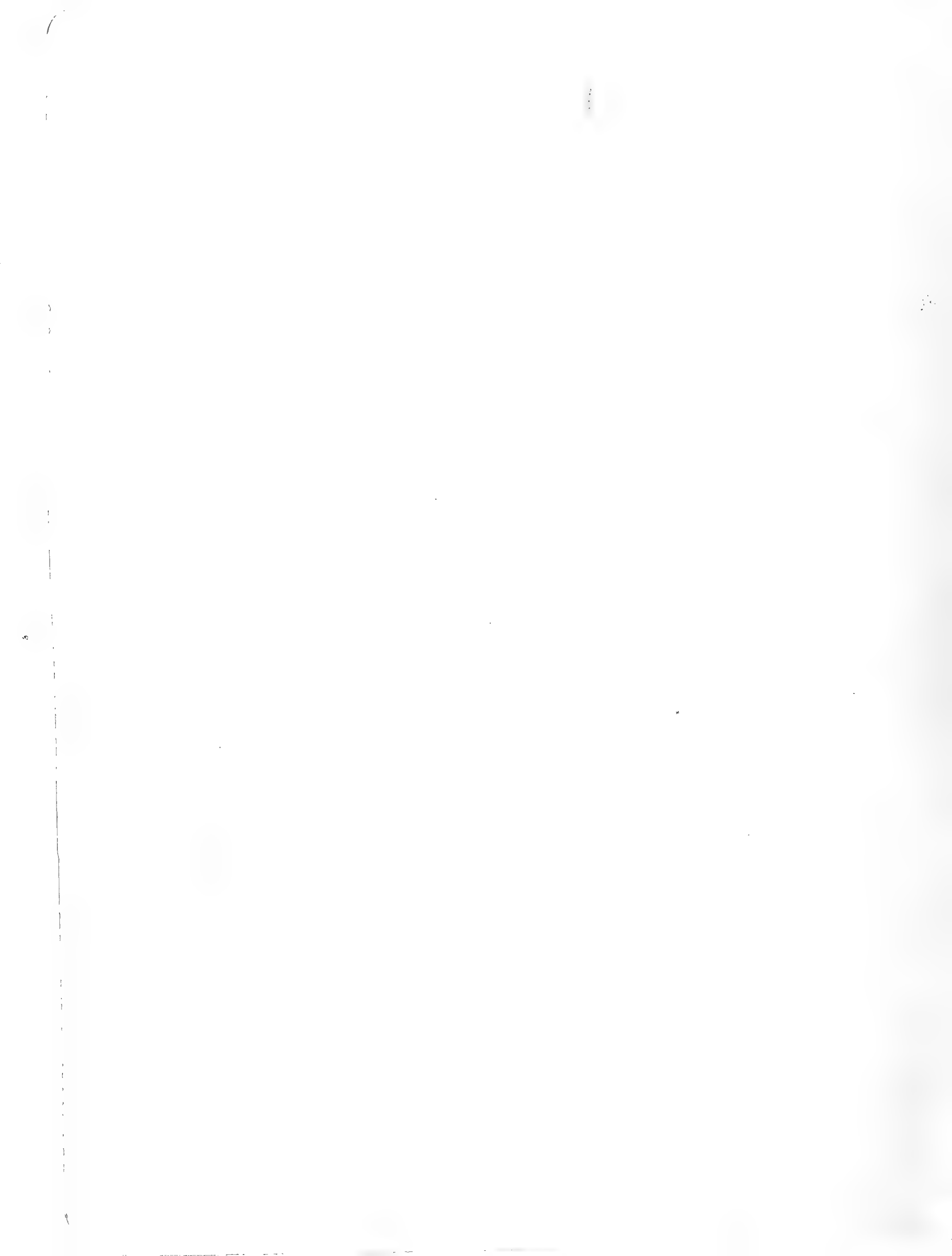




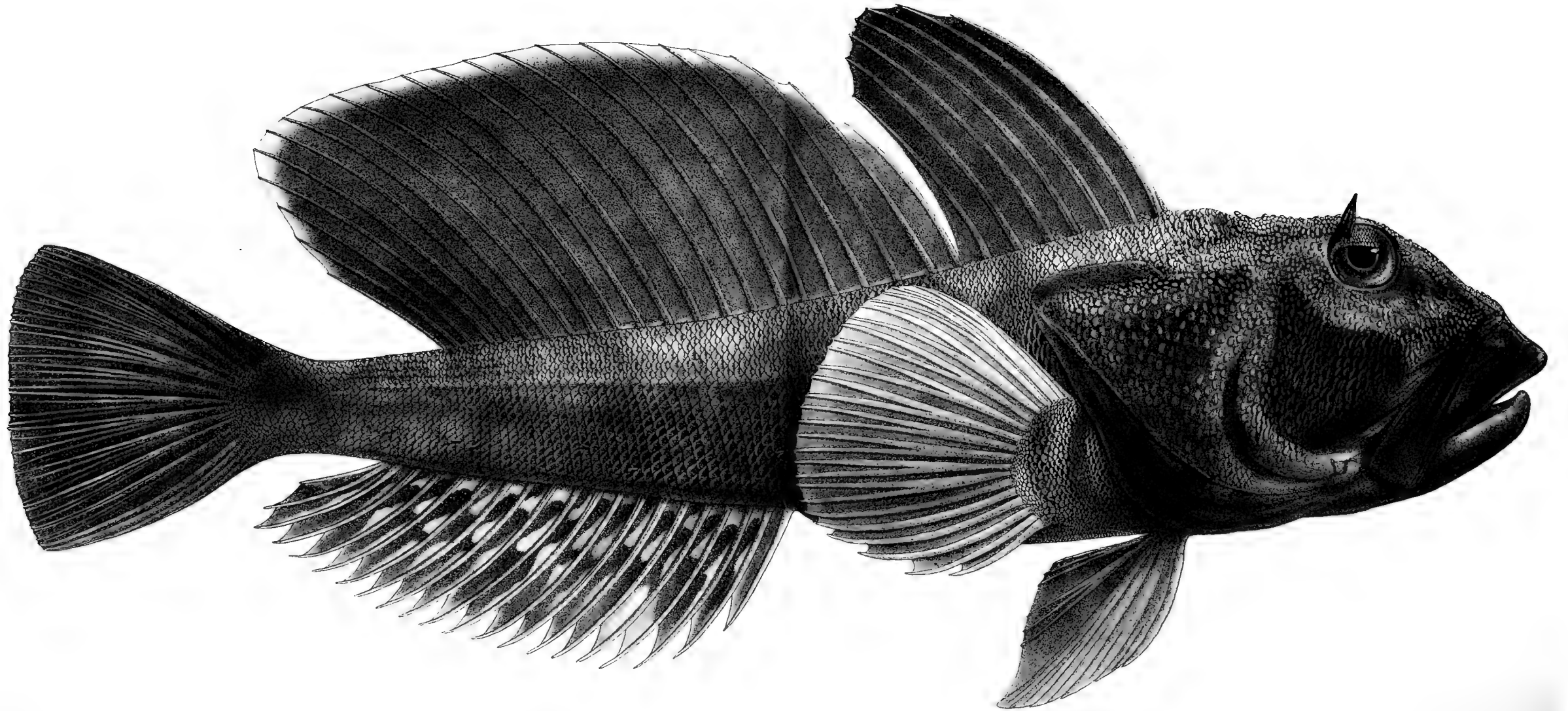




GOBIO.  
(Agelhorn.)

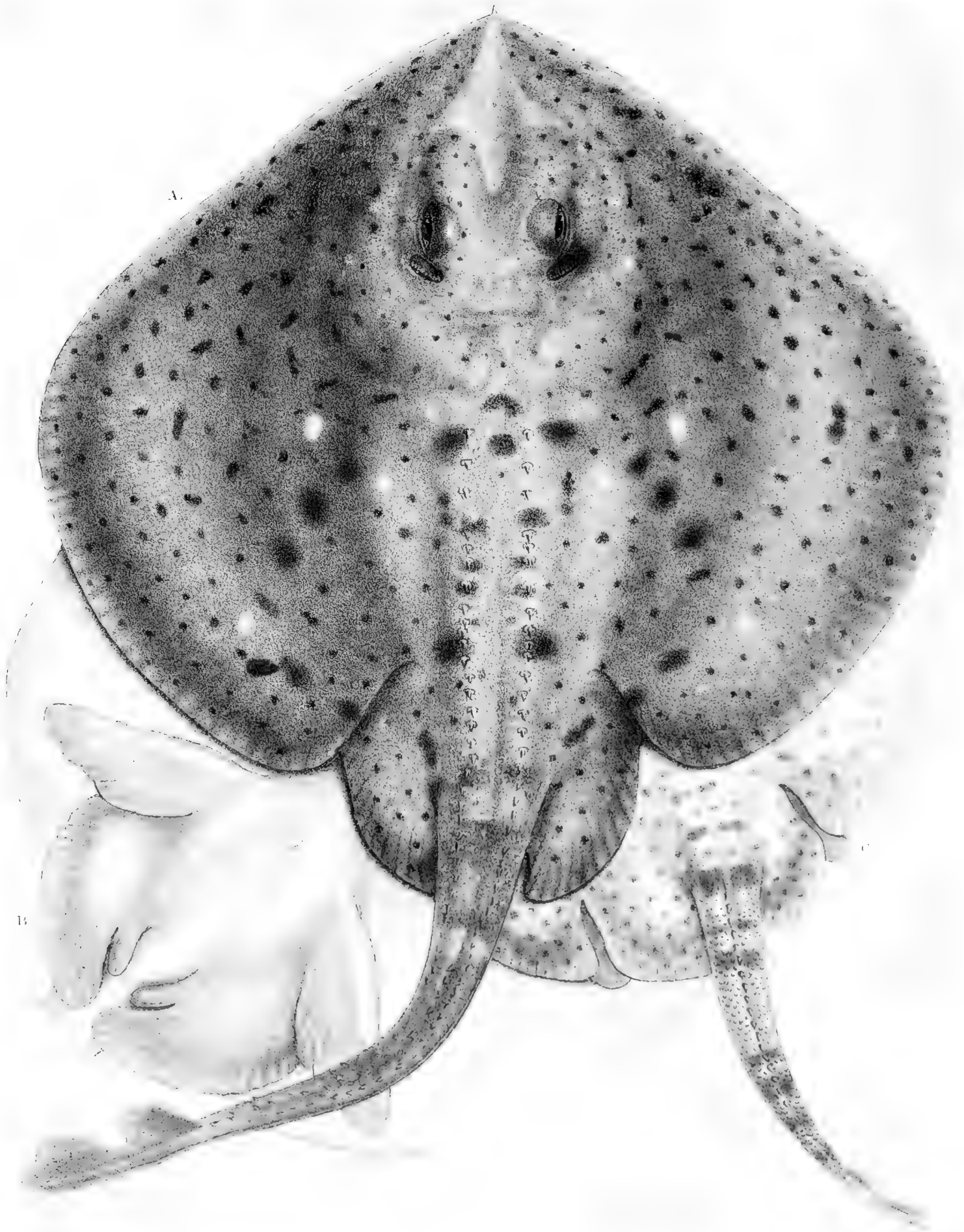




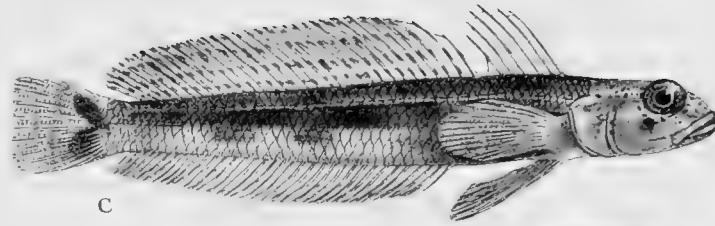


APHRITIS GOBIO.  
(Straits of Magellan.)

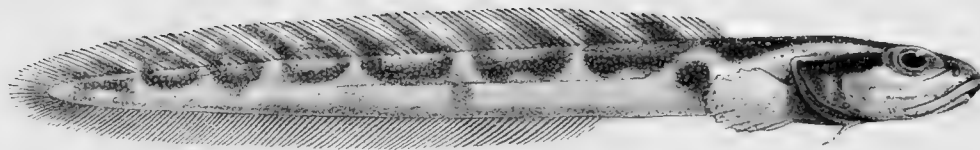




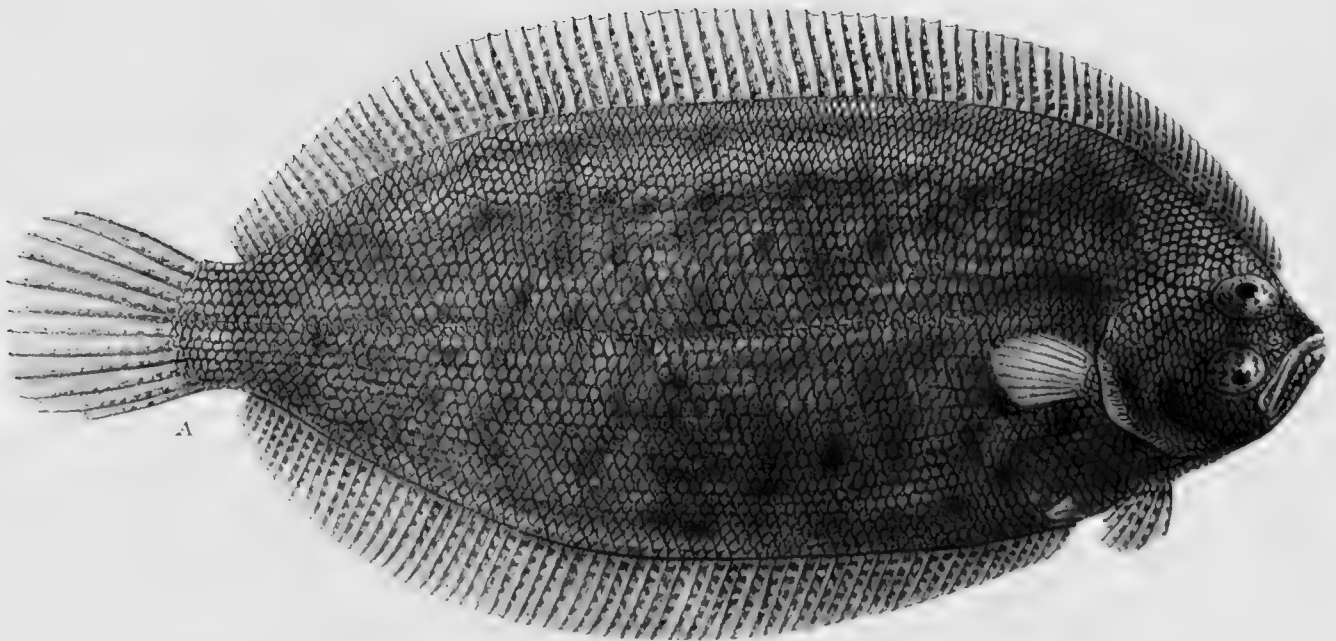




C



B



A











*P. PICTA*. B. *UMBRINA REPIDII*.  
(Juan Fernandez.)

Kurum Bros imp.



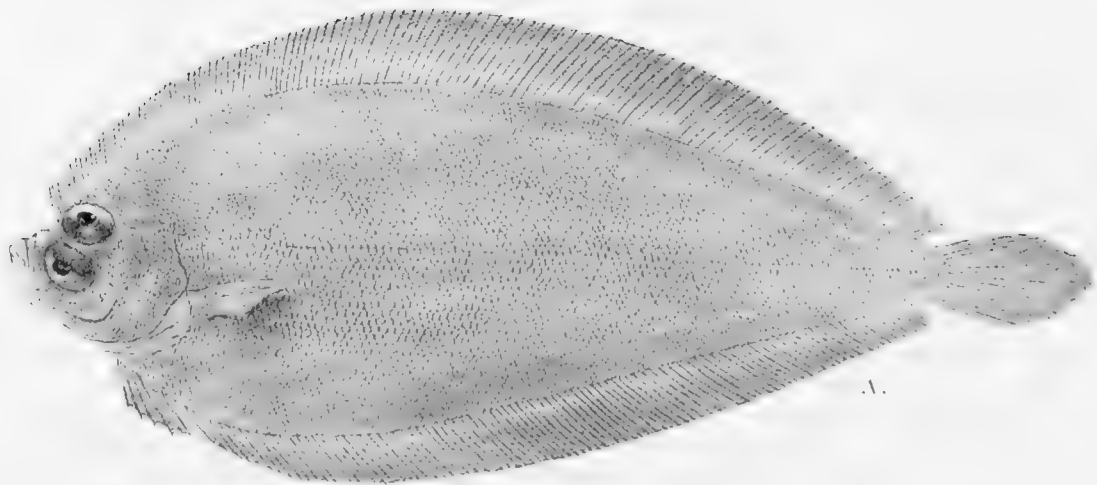
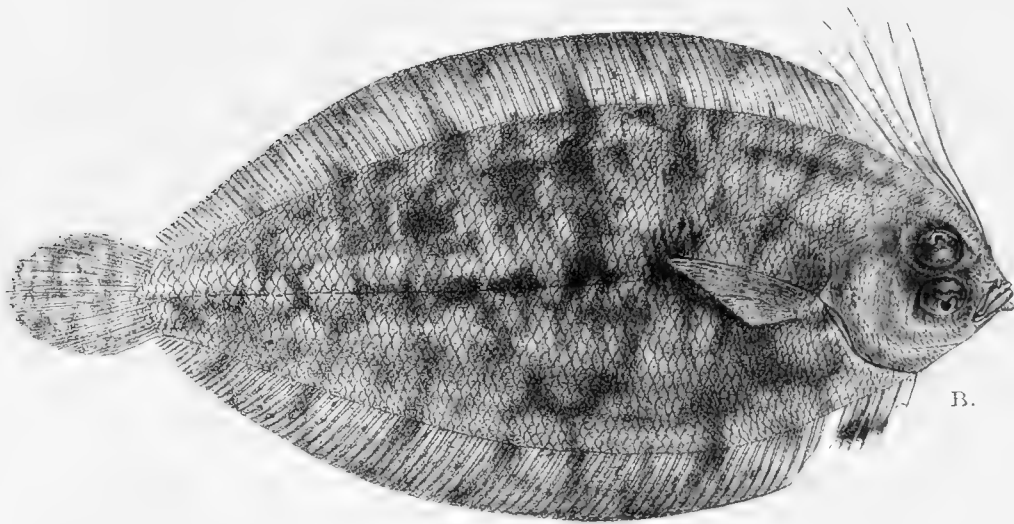


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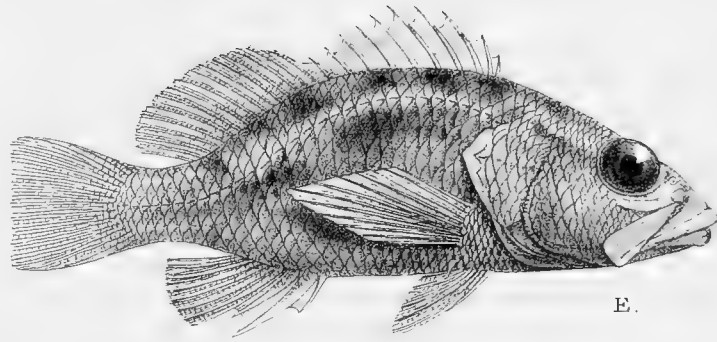
B.

A. RAJA NITIDA. B. SOLENOGNATHUS FASCIATUS.  
(Twortidid Bay.)

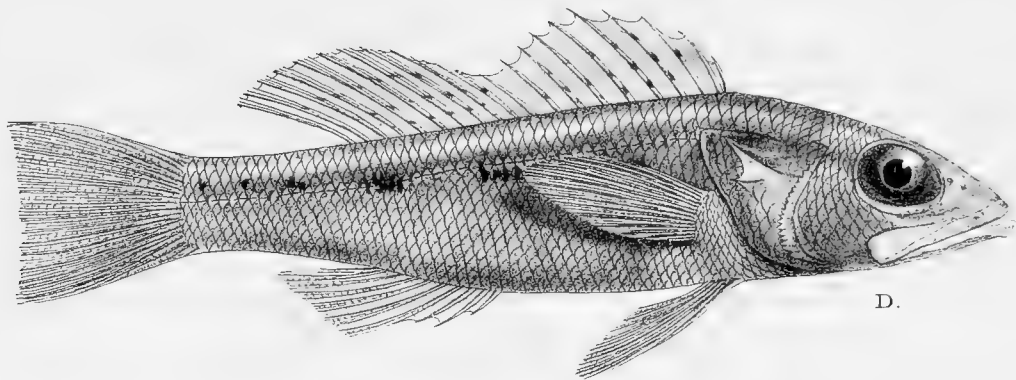




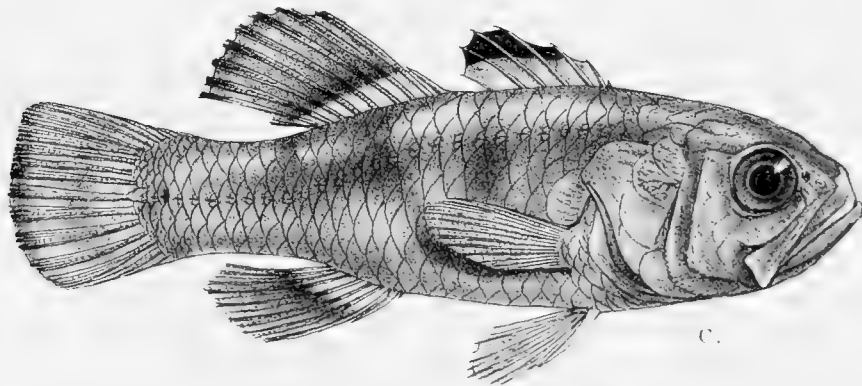




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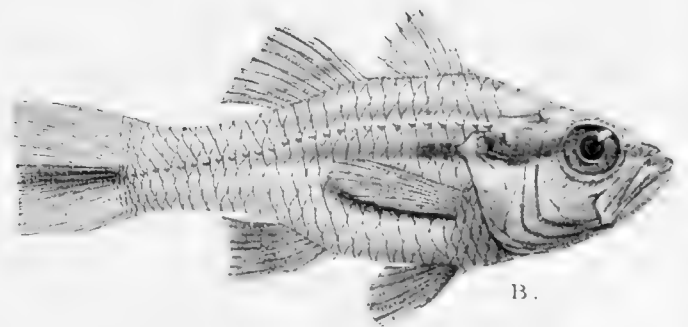
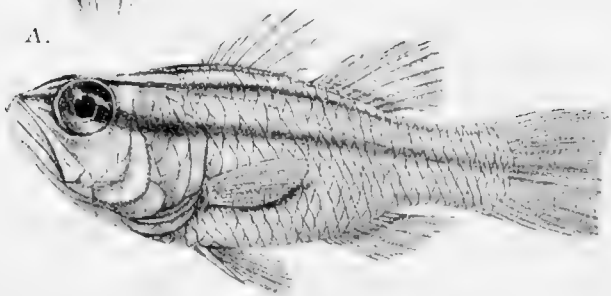
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C.



A.



B.

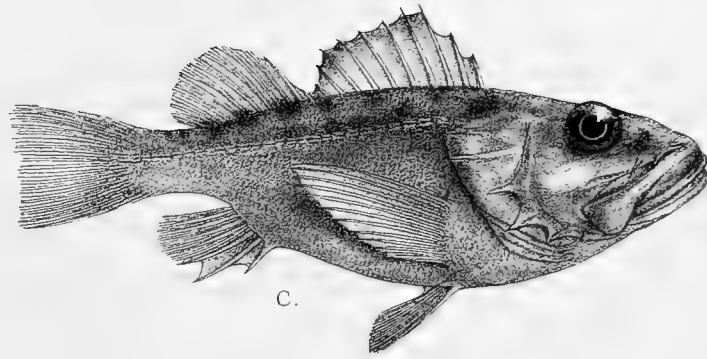
R. Minterm del.

A. APOGON SEPTEMSTRIATUS. B. APOGON ...  
 D. CENTROPRISTIS PLEUROSEMI ...

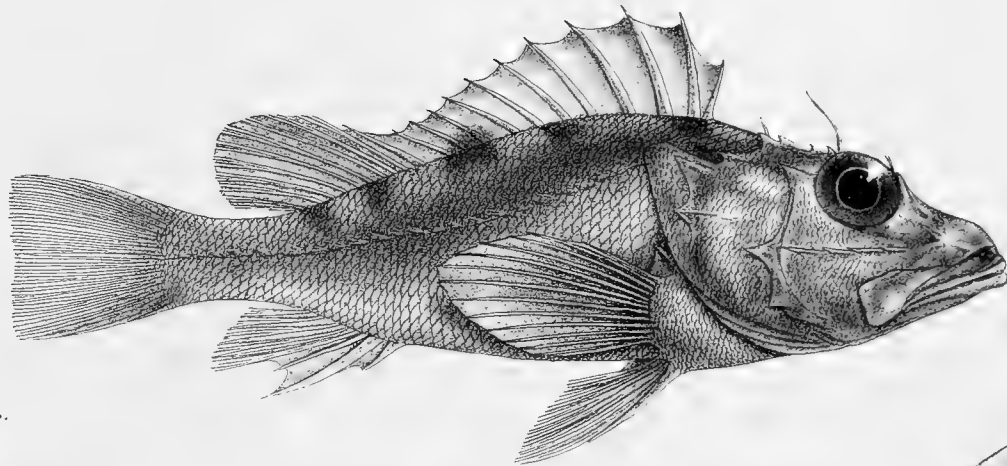
Minterm Exec imp.



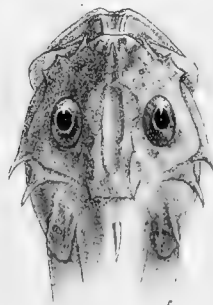
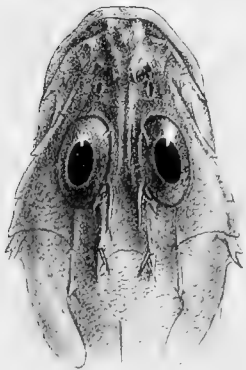




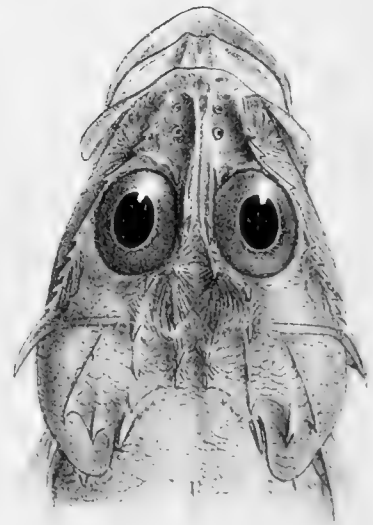
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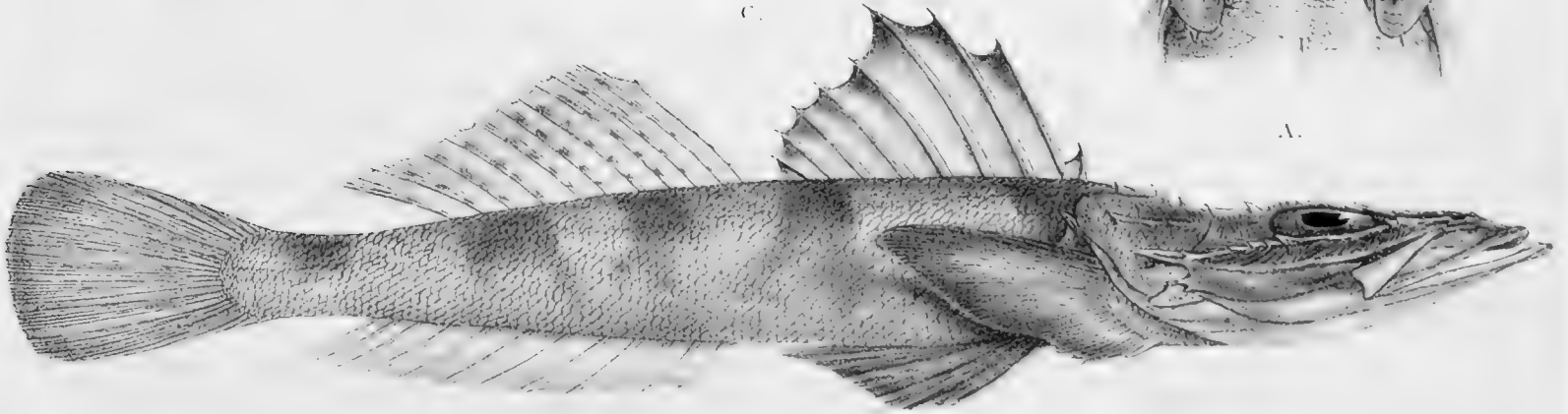
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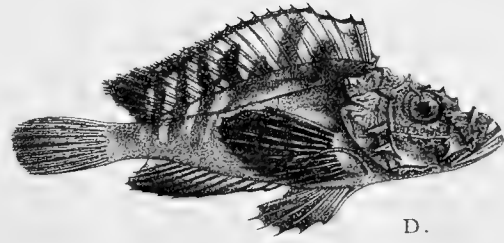
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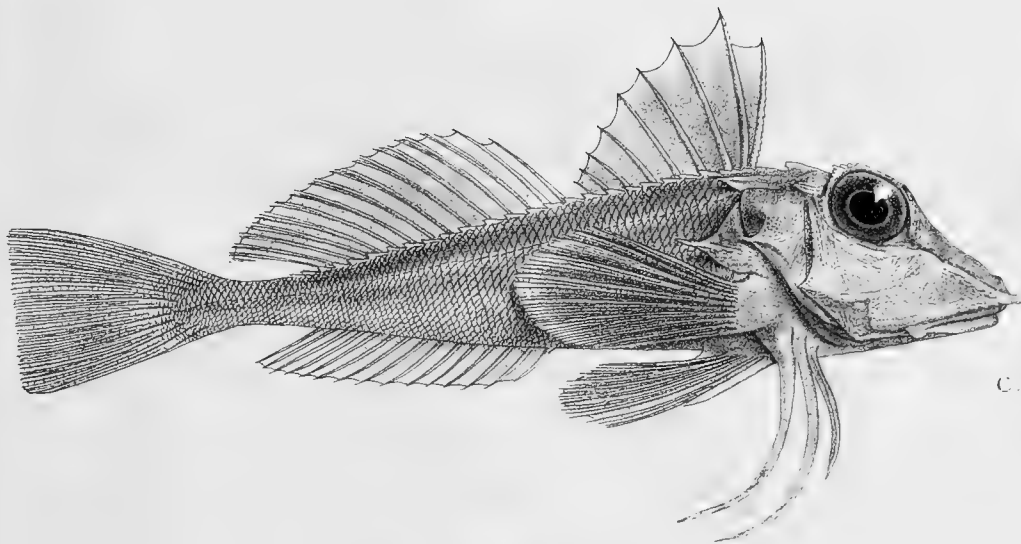
A.



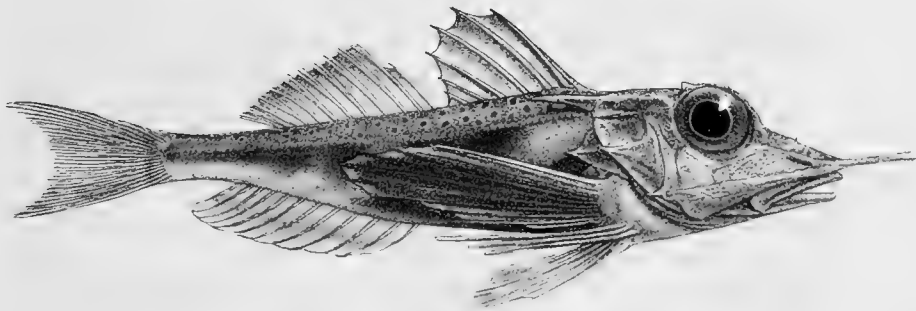
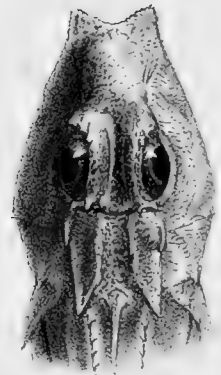




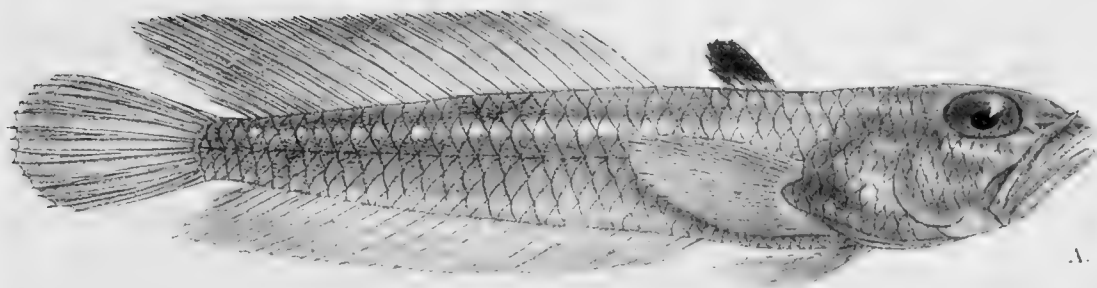
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C.



B.



A.

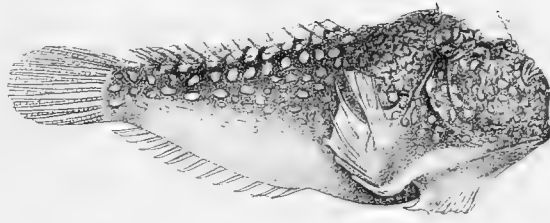


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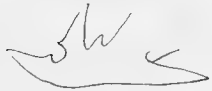
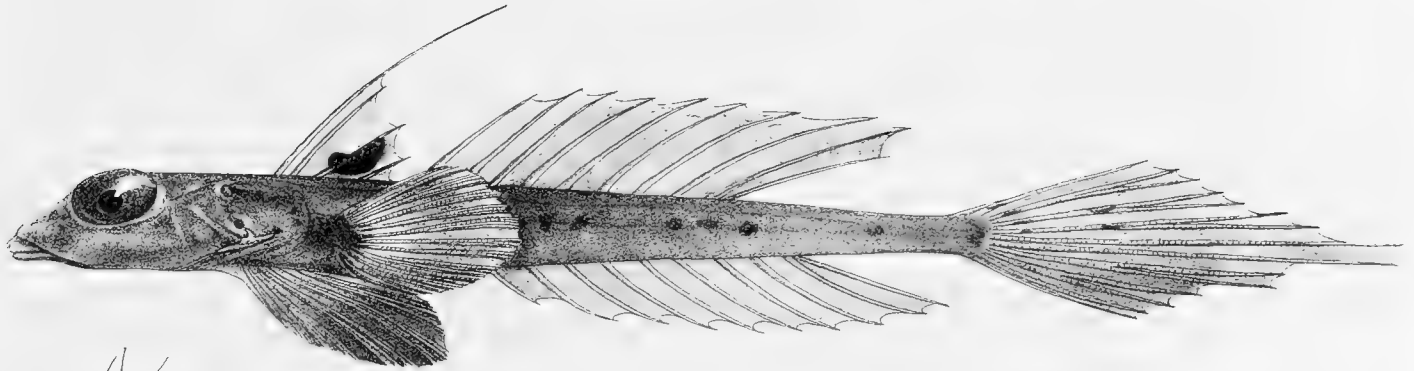
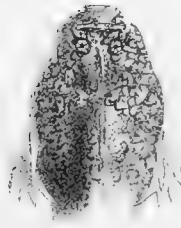
A. ACANTHAPHRITIS GRANDISQUAMIS. B. TRIGLA LEPTACANTHUS.  
 C. LEPIDOTRIGLA SPILOPTERA. D. MINOUS PICTUS.  
 (Arafura Sea.)

M. J. S. P. 1880

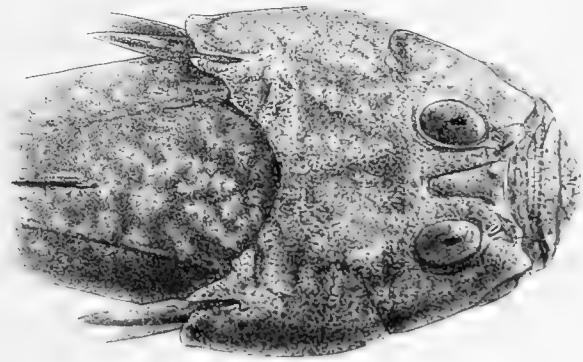
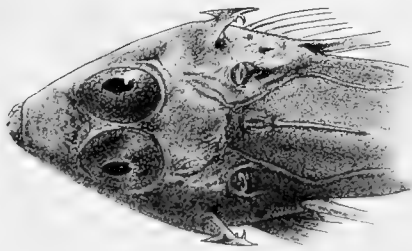




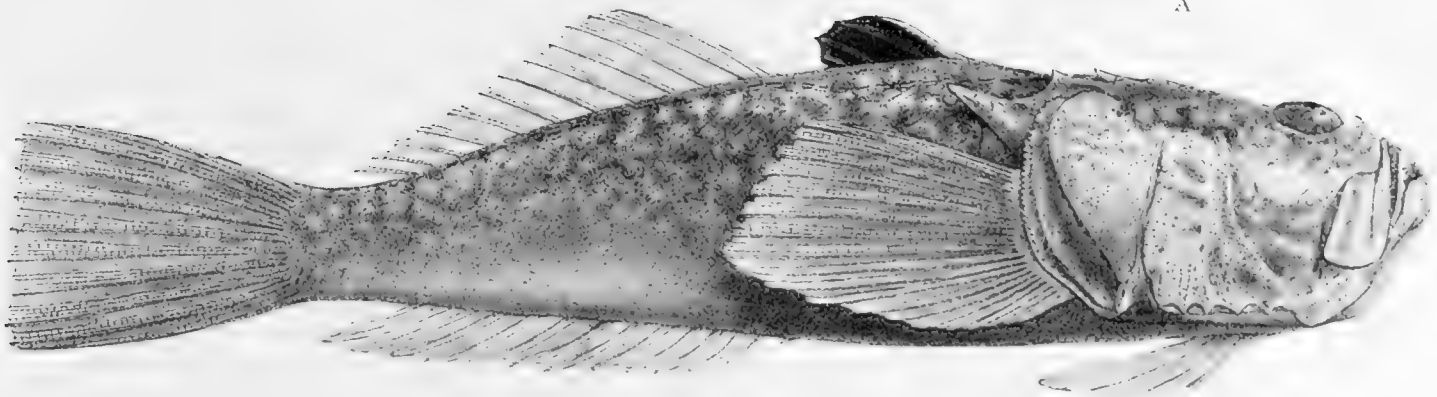
C.



B.



A.





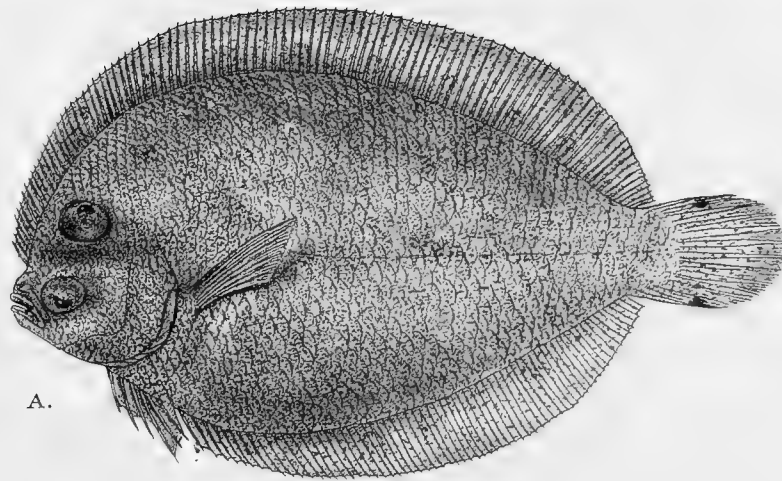


R. Minton del.

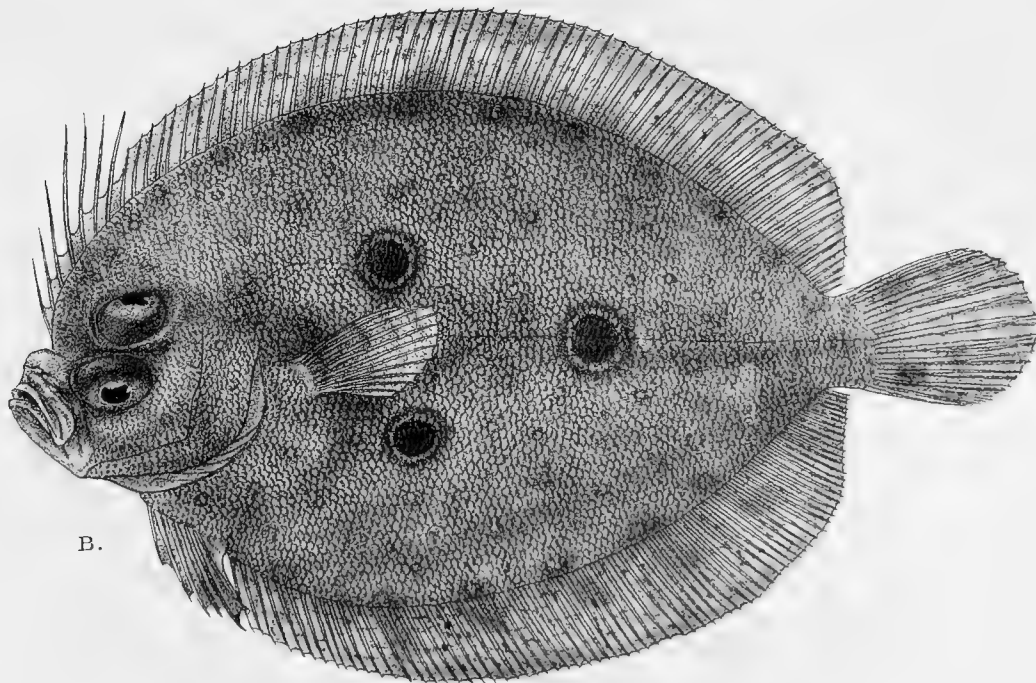
A. OPHIDIUM MURÆNOLEPIS. B. PROPOMA ROSEUM. C. XIPHOCHILUS QUADRIMACULATUS.  
D. HELIASTES ROSEUS.  
(Kai Islands.)



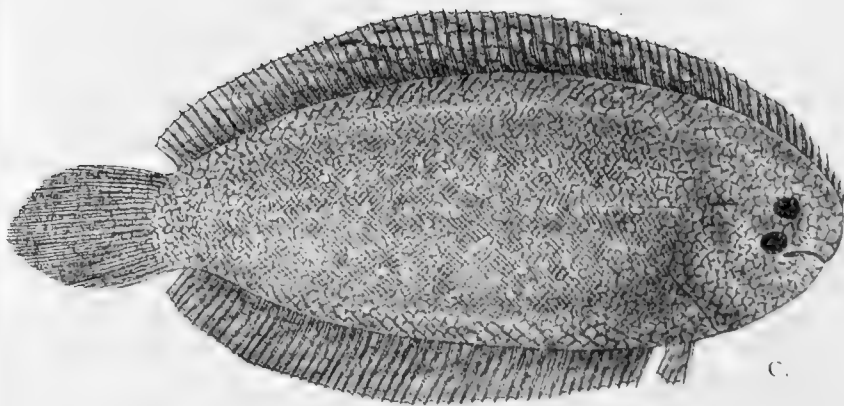




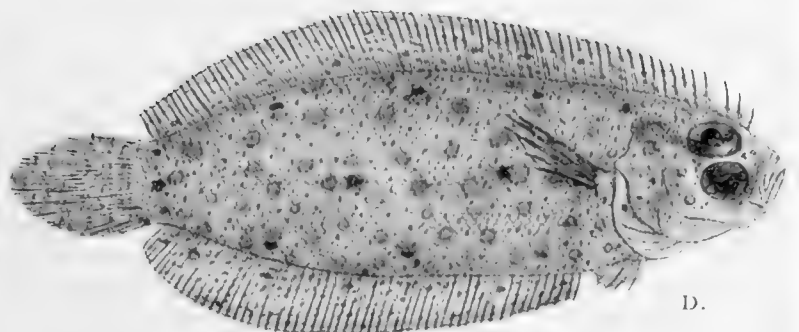
A.



B.



C.

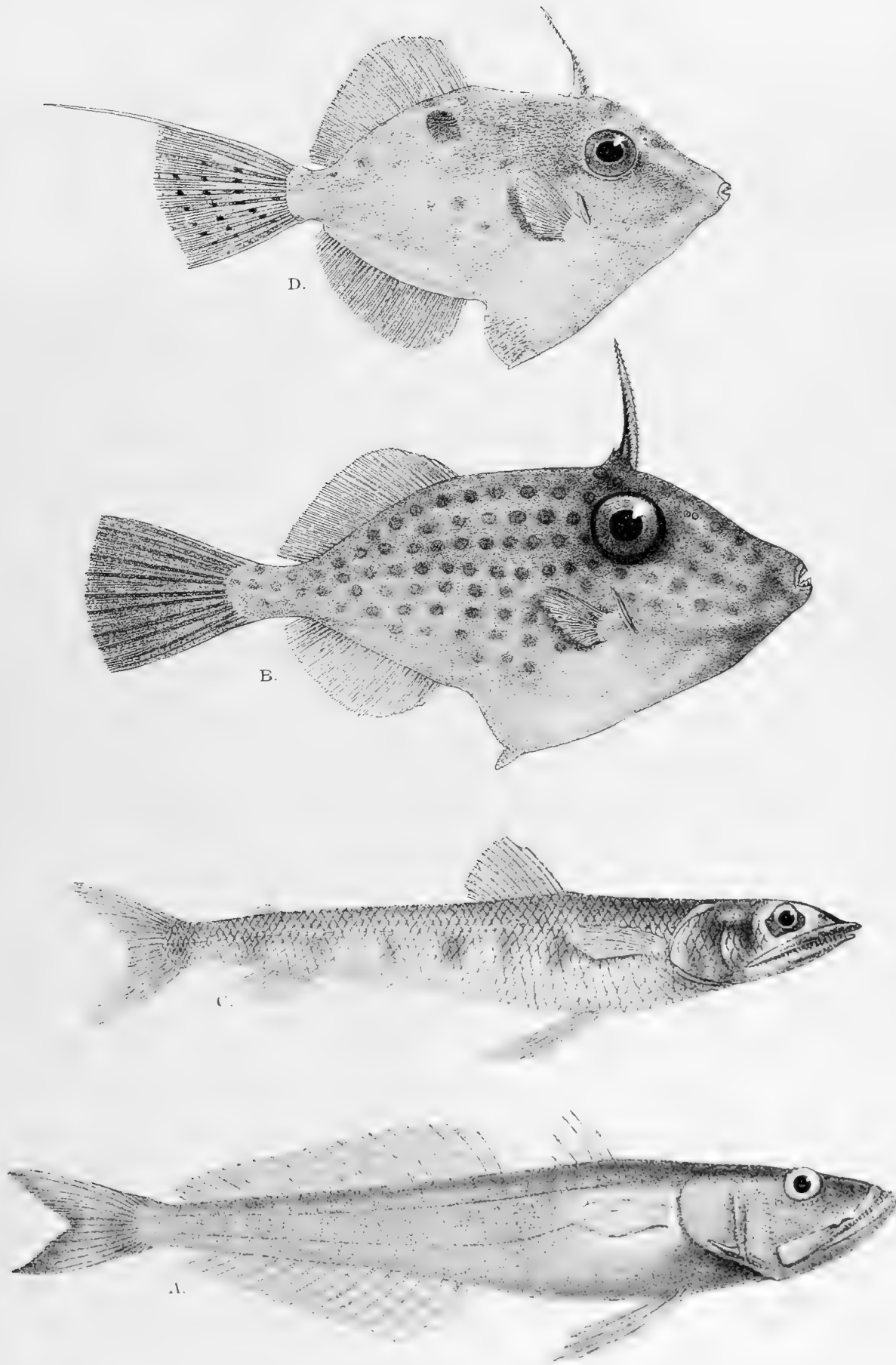


D.













H. Minckley del.

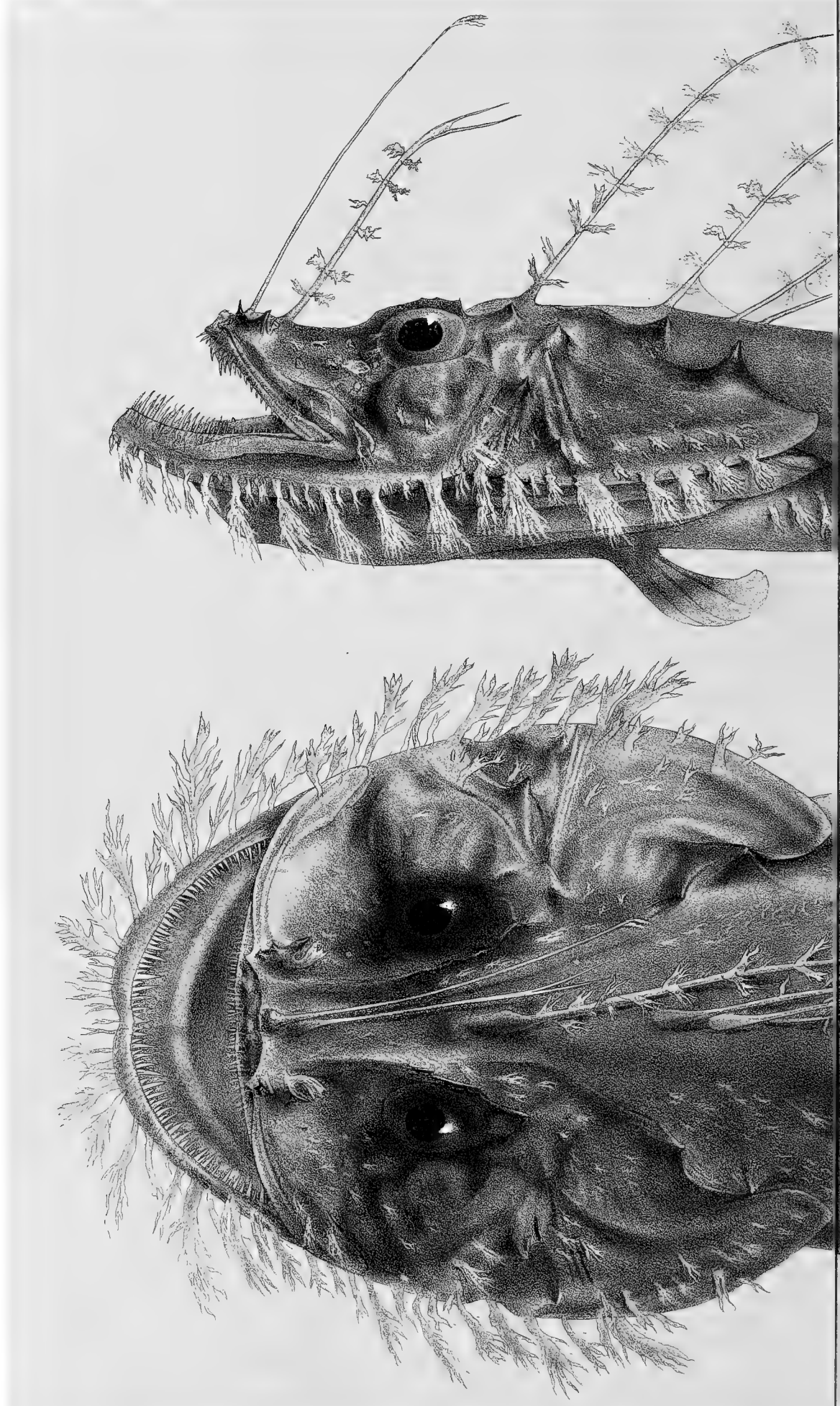
A. B. PSEUDORHOMBUS OCELLATUS ♂ & ♀. C. NEMATOPS MICROSTOMA.  
*Admiralty Islands.*

Minckley Br. & Imp.









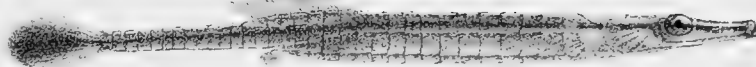
R. Minckley del.







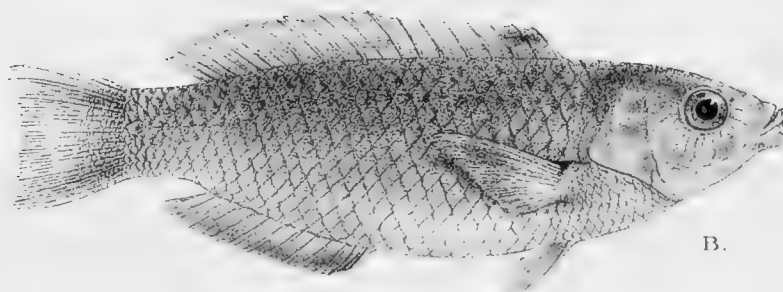




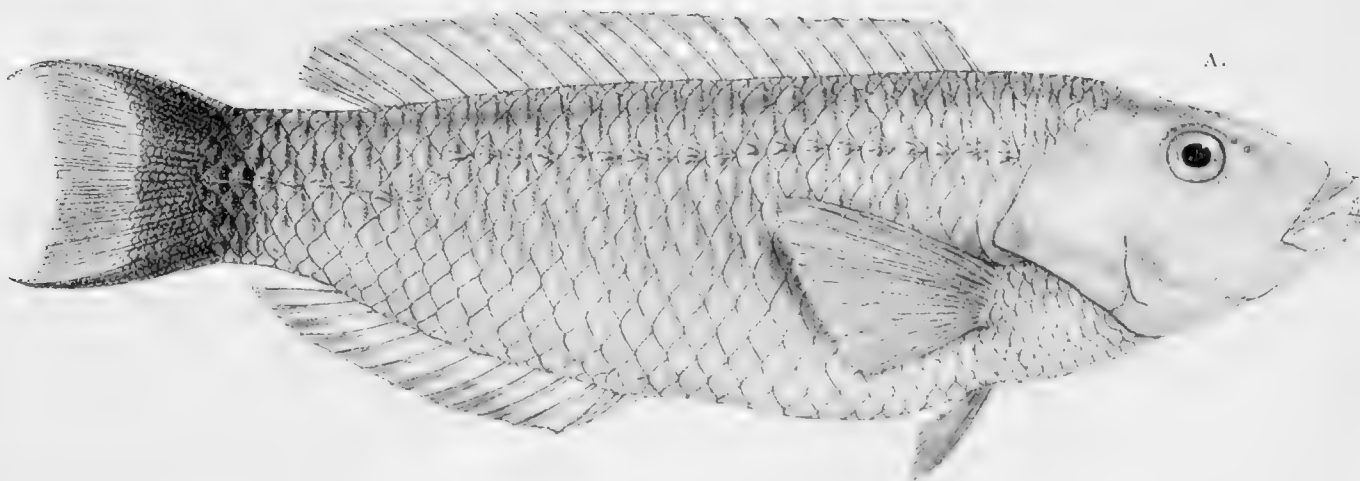
D.



C.



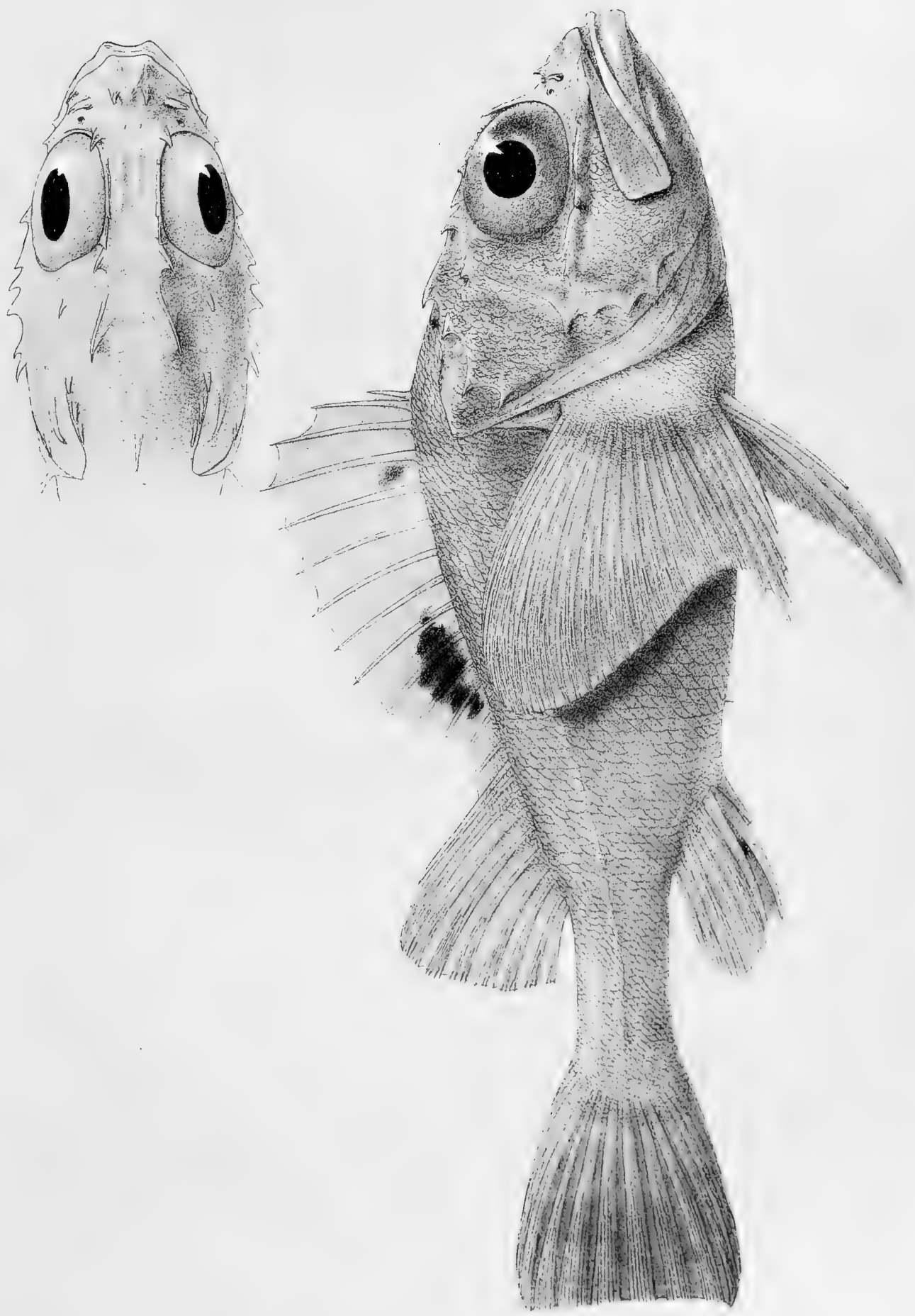
B.



A.









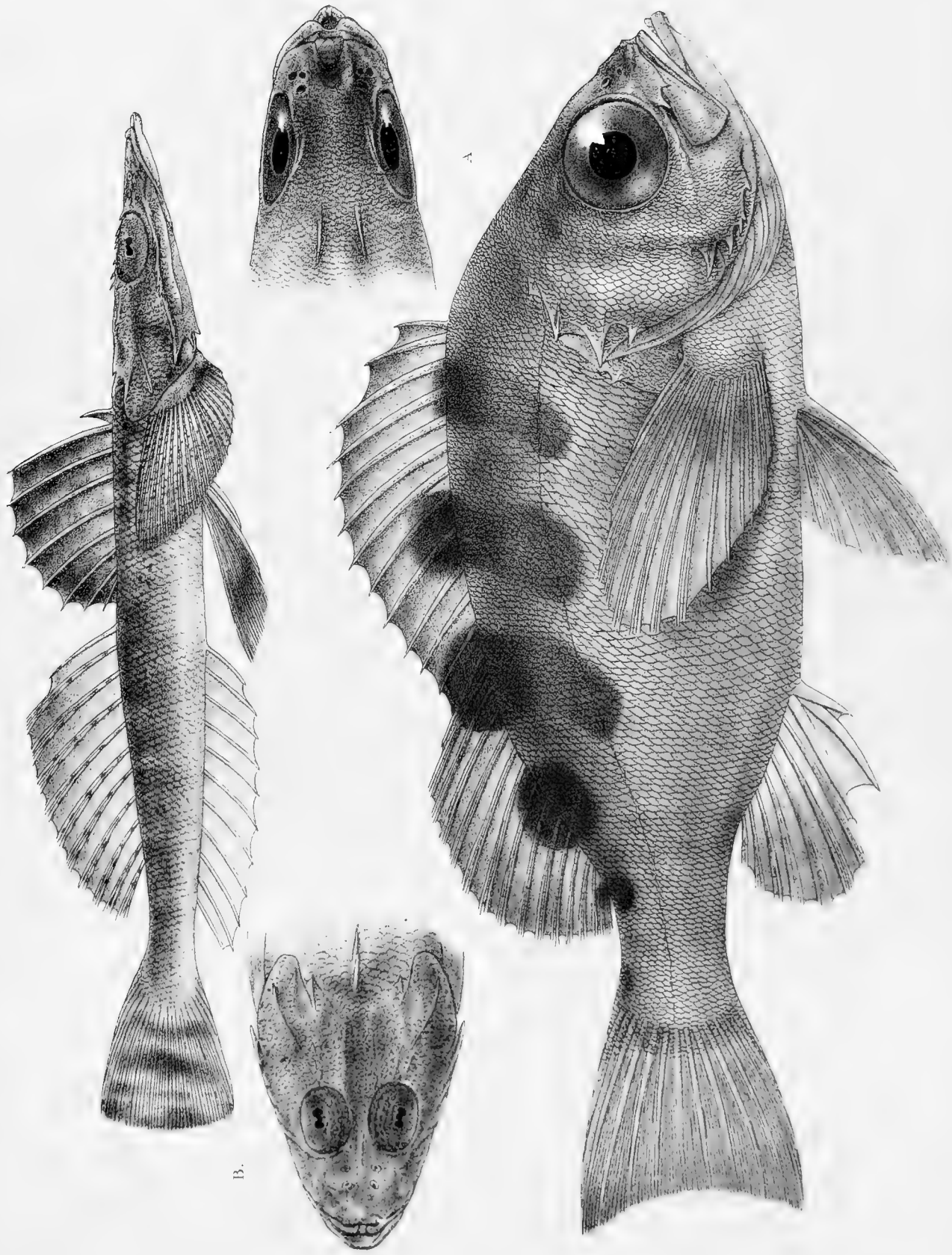


Macleay del.

SEBASTES OBLONGUS.  
(Japan.)

Macleay. Proc. Linn. Soc. New South Wales.

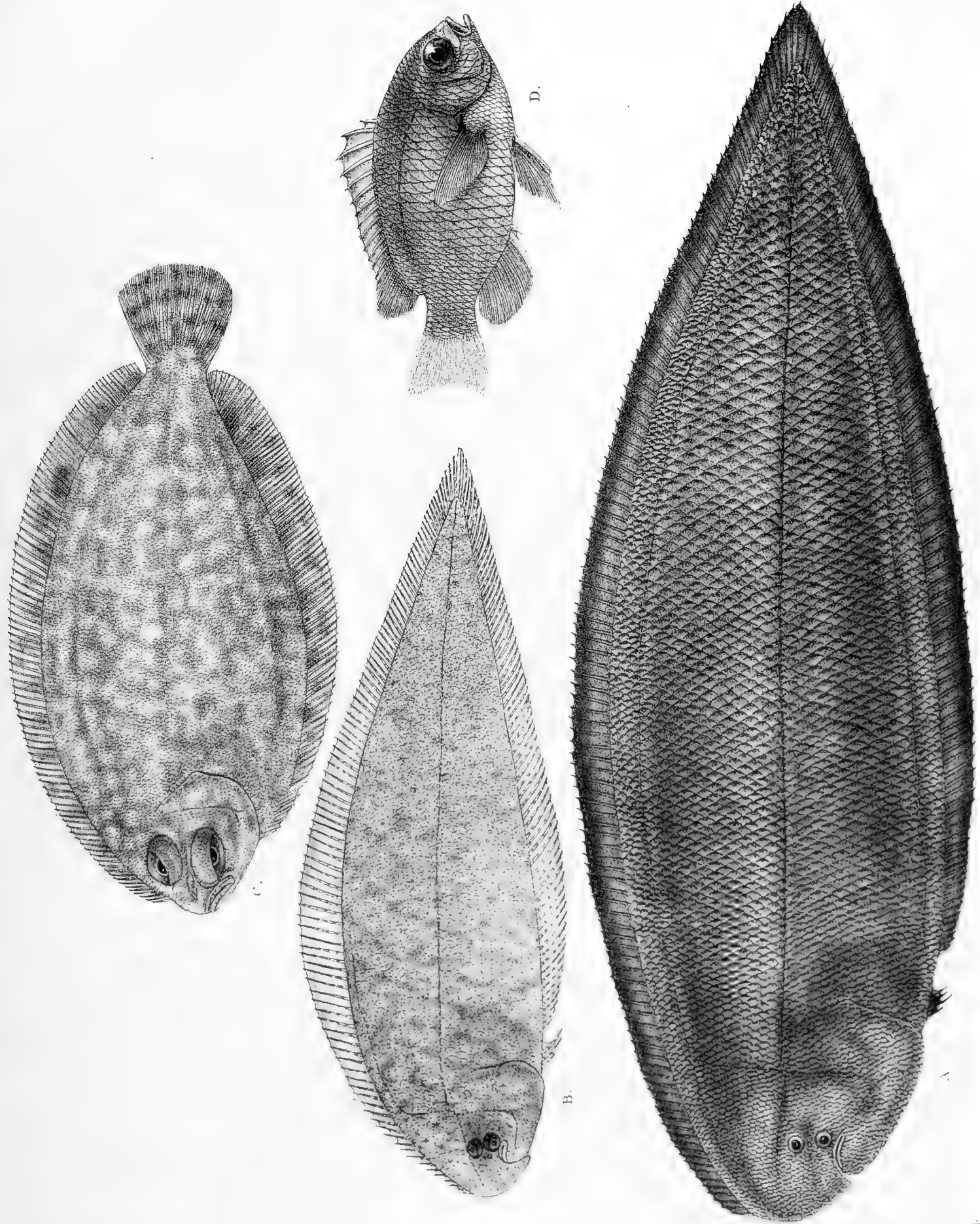




B.

PL. PLATYCEPHALUS RUDIS.  
(Japan.)

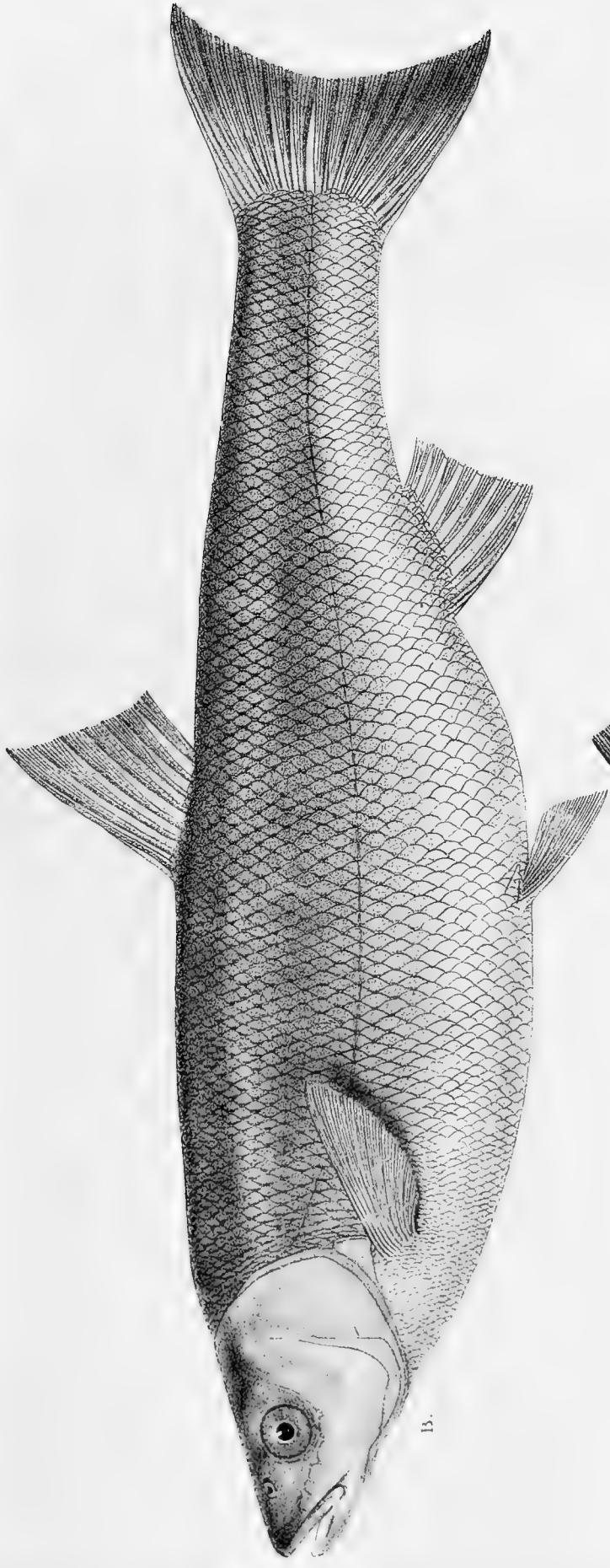




A. *CYNOGLOSSUS JOYNERI*. B. *CYNOGLOSSUS INTERRUPTUS*.  
 C. *LEPIDOGOBIA MACULATA*. <sup>Japan</sup>  
 D. *HELMIASTES FLAVICULI* A.  
*Pennac. bass.*

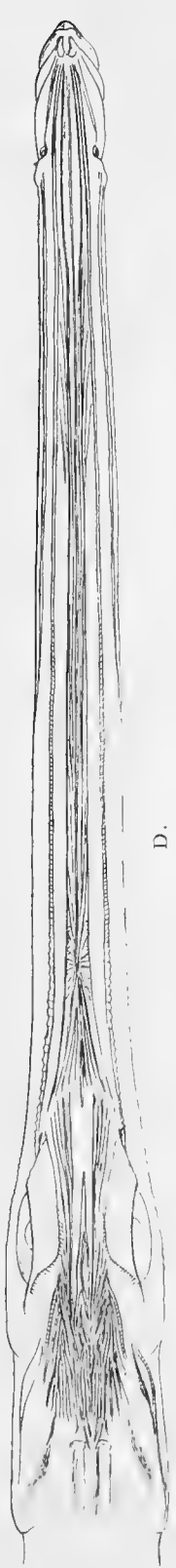






A. SALMO MACROSTOMA. B. LEUCISCUS HAKUENSIS.  
(Japan.)





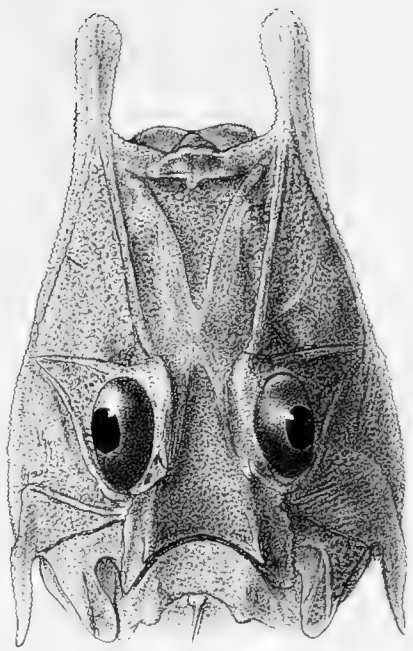
D.



C.



B.



A.

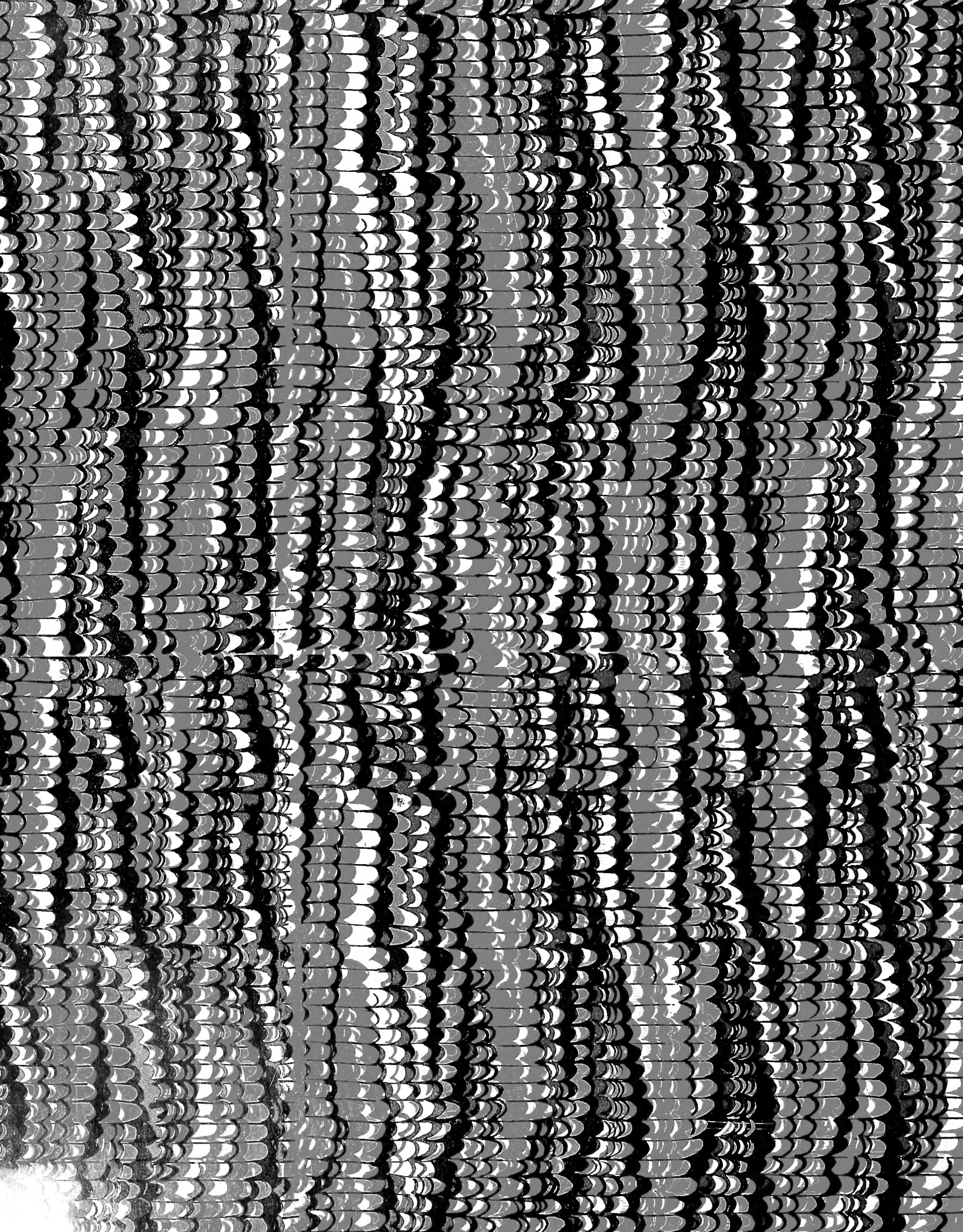


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Page 7

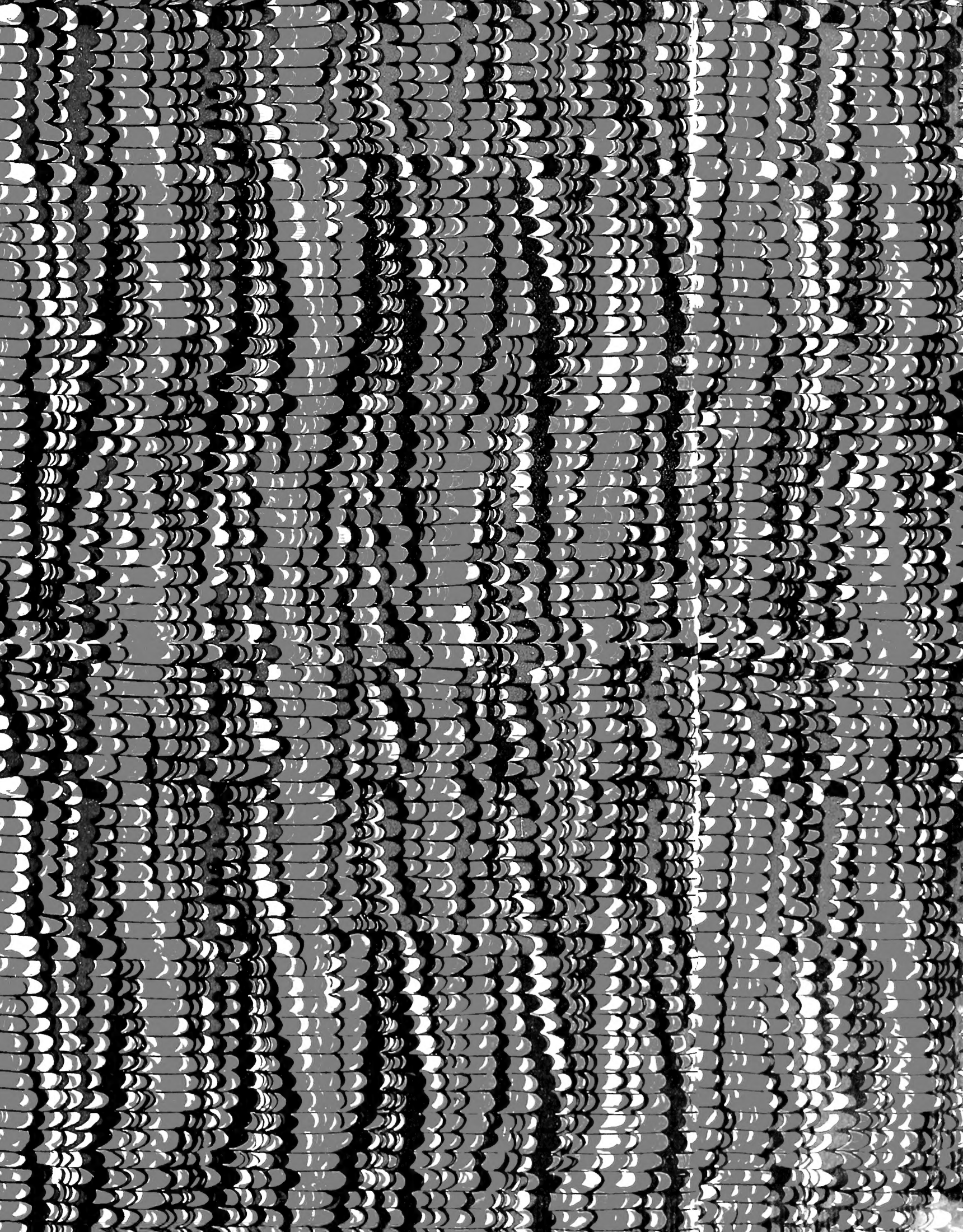












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