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# STUDIES IN ICHTHYOLOGY.

No. 5.\*

By

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(Plates xx-xxi and Figures 1-2.)

Family HEPTRANCHIIDÆ.

Genus *Notorynchus* Ayres, 1855.

*Notorynchus* Ayres, Proc. Calif. Acad. Sci., i, 1855, p. 73. Type, *N. maculatus* Ayres = *N. platycephalus* Tenore (*vide* Garman, Bull. Mus. Comp. Zool. Harv., xxxvi, 1913, pp. 18-20).

*Notorhynchus* Jordan and Fowler, Proc. U.S. Nat. Mus., xxvi, 1903, p. 594.

The original definition of this genus is not available to me. The generic name is spelt *Notorhynchus* by Marschall and by Jordan, and *Notorynchus* by Scudder and by Garman.

*Notorynchus macdonaldi*, sp. nov.

(Plate xx, figs. 3-5.)

[Seven-gilled shark] Quoy, Voy. Astrolabe, Hist. Voy., i, 1830, p. 211 (Jervis Bay, New South Wales).

*Heptranchus indicus* Macdonald and Barron, Proc. Zool. Soc. Lond., Sept. 15, 1868, p. 371, pl. xxxiii [off Flinders Id.], Bass Strait (F. M. Rayner, Jan., 1858).

Not *Notidanus indicus* Agassiz, 1835 = *Squalus platycephalus* Tenore, 1810 (*vide* Garman, 1913, and Sherborn, Index Anim.).

*Notidanus indicus* Hutton, Cat. Fish. New Zealand, 1872, p. 79, and Trans. N.Z. Inst., v, 1873, p. 271. *Id.* Ramsay, Proc. Linn. Soc. N. S. Wales, v, 1880, p. 96 (Port Jackson, N.S.W.; 6 ft. 4 in.). *Id.* Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), p. 138, and *ibid.* 1890 (1891), p. 38 (Tasmania). *Id.* Ogilby, Cat. Fish. N. S. Wales, 1886, p. 3 (Jervis Bay and Sydney, N.S.W.). *Id.* Parker, Nature, xliii, Dec. 11, 1890, p. 142, fig. (of sternum). Not *N. indicus* Agassiz, 1835.

*Heptanchus indicus* Castelnau, Proc. Zool. Acclim. Soc. Vict., i, 1872, p. 217 (Hobson's Bay, Victoria). *Id.* Haswell, Proc. Linn. Soc. N. S. Wales, ix, 1884, pp. 88 and 381, pl. i, fig. 5, and pl. x, figs. 1-2. *Id.* Ogilby, Proc. Linn. Soc. N. S. Wales (2), iv, 1889, p. 179.

*Heptranchus griseus* Macdonald, Proc. Zool. Soc. Lond., Sept. 15, 1873, p. 312. Off Flinders Id., Bass Strait. New name for *H. indicus* Macdonald and Barron, 1868 [anticipated by Agassiz, 1835]. Not *Heptanchus griseus* Rafinesque, 1810, from Europe; regarded as congeneric, in *Notidanus*, by Günther.

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\* For No. 4 see RECORDS OF THE AUSTRALIAN MUSEUM, Vol. xviii, No. 3, 1931, p. 96.

*Notidanus (Heptanchus) indicus* McCoy, Prodr. Zool. Vict., dec. v, 1880, p. 16, pl. xliii, fig. 2 (Hobson's Bay, Victoria).

? *Heptanchias pectorosus* Garman, Bull. Essex Inst., xvi, 1884, p. 56 (13 of reprint). Patagonia (*vide* Garman, 1913).

? *Heptanchias haswelli* Ogilby, Proc. Linn. Soc. N. S. Wales, xxii, 1, Sept. 17, 1897, p. 62. Cape of Good Hope?

*Heptanchias indicus* Waite, Rec. Canterb. Mus. i, 1907, p. 6 (New Zealand).

*Notorhynchus indicus* Zietz, Trans. Roy. Soc. S. Austr., xxxii, 1908, p. 289 (S. Australia).

*Notorynchus pectorosus* Garman, Bull. Mus. Comp. Zool. Harv., xxxvi, 1913, p. 20.

*Notorhynchus pectorosus* McCulloch, Austr. Zool., i, 7, 1919, p. 219, fig. 3a.; Austr. Zool. Handbook, i, 1922, p. 4, fig. 3a. *Id.* Waite, Rec. S. Austr. Mus., ii, 1, 1921, p. 10, fig. 5; Fish. S. Austr., 1923, p. 24 and figs. *Id.* Phillipps, N.Z. Journ. Sci. Tech., vi, 1924, p. 259, fig. 1 (Hokitika, New Zealand).

*Notorynchus griseus* McCulloch, Austr. Mus. Mem., v, 1929, p. 3.

*Heptanchias macdonaldi* Ogilby MS.

Total length 1,990 mm. or 78 in. Width of head (280 mm.) equal to its length, measured from tip of snout to first gill-opening. Eye 30 mm. Interorbital 173. Snout to origin of dorsal 1,010. Caudal 655. Pectoral 270. Dorsal 173, its base 150. First gill-opening 130; last 73. Posterior margin of eye to spiracle 110. (Fins measured from anterior origin to tip.)

Snout broadly rounded. Nostrils in a notch on anterior profile. Margin of eye free. No nictitating membrane. Spiracle very small, a considerable distance behind eye. Two similar openings, close together, on top of head. Gape of mouth extending to beyond vertical of eye, but not so far as vertical of spiracle. A median tooth in both jaws. Teeth of upper jaw curved and acutely pointed, the lateral ones with one or more pointed cusps on their outer sides and often a smaller inner cusp. A triangular pocket of skin on each side of rictus. Teeth of lower jaw comb-like, with five or six sharp cusps, the shoulder of the first and largest cusp of each tooth serrated. Gill-slits seven, the first largest, and the last slanting over the origin of the pectoral.

General form elongate, broadest near shoulders; axis of tail not very much elevated. Lateral line present on upper part of sides, extending to lower half of tail and then ascending along base of lower caudal lobe. One dorsal fin, situated over interspace between ventrals and anal. Caudal elongate, with a very long lower lobe, separated from the tip by a notch. No caudal pits. Body covered with rough shagreen which forms prominent denticles on upper surface of tail. A large papilla at each abdominal pore immediately behind the anus.

General colour grey above, whitish below. Widely spaced, round, white spots, larger than pupil, on back and paired fins. Head, body, tail and most of fins with large speckles of dark grey.

Described and figured from the female holotype, 78 inches in total length, from Manly, New South Wales, August 20, 1930; presented by the late E. W. Scott. Austr. Mus. regd. no. IA.4640.

Small copepod parasites on roof of mouth. No identifiable stomach contents. No embryos.

This specimen agrees fairly well with Müller and Henle's figure of *Heptanchus indicus*, but has the ventral fins nearer the dorsal. No white spots on the back are shown in their figure, but they are most conspicuous in my specimen. Macdonald

and Barron stated that white spots were present in a male and absent in a female, and suggested that they might have been the result of disease.

*Nomenclature.*—Macdonald and Barron gave an excellent description and plate of the Seven-gilled Shark of Bass Strait, which they called *Heptranchus indicus*, quoting no authority for the specific name. The identity of this species with the supposedly congeneric *Notidanus indicus* Agassiz<sup>1</sup> was disputed by Garman (1913). In 1873, Macdonald referred to the Bass Strait specimens as *Heptranchus griseus*, without stating that this was a new name, or perhaps regarding it as conspecific with the European *Squalus griseus* Gmelin or *Hexanchus griseus* Rafinesque, Günther's "Catalogue," with these names in *Notidanus*, having been issued in the meantime. Apparently the Australian form has no name of its own, so I am proposing one here which was suggested in a letter from J. D. Ogilby to A. R. McCulloch, dated October 22, 1909, as follows: "I have long been of opinion that our *Heptranchias* requires a new name and so list it as *H. macdonaldi*; however, as it does not occur here [Queensland], I hand it over unreservedly to you." To this, McCulloch had appended a note in his card-index: "We have received a small specimen from Port Jackson which accurately agrees with Müller and Henle's figure of *H. indicus*. Macdonald and Barron's figure in P.Z.S. of a specimen from Bass Straits is very good, and there should be little difficulty in deciding if it is correctly identified." It has thus remained for the present writer to instate Ogilby's name, which does not appear to have been published hitherto.

#### Family ISURIDÆ.

#### Genus *Isuropsis* Gill, 1862.

#### *Isuropsis*, sp.

(Plate xx, figs. 1-2.)

*Lamna glaucus* Günther, Cat. Fish. Brit. Mus., viii, 1870, p. 391. Cape and St. Helena. Not *Oxyrhina glauca* Müller and Henle, Syst. Plagiost., 1839, p. 69, pl. xxix, from Japan.

*Lamna glauca* Gilchrist, Mar. Invest. S. Afr., i, 1902, p. 163. *Id.* Thompson, Mar. Biol. Rep., ii, Cape Town, 1914, p. 145.

*Isurus glauca* Barnard, Ann. S. Afr. Mus., xxi, 1925, p. 33 (not fig.).

Head (314 mm.) 3·3 in length from snout to middle of caudal margin (1040). Depth (195) 5·6 in same. Eye (25) 3·6 in snout (90). Snout, measured from nostril (62), 1·6 in mouth (103). Distance from anterior border of nostril to that of eye (32) 4·4 in distance from posterior margin of eye to first gill-slit (142). Interocular width (71) 1·1 in length of snout from level of anterior margins of eyes (81). Internarial space (44·5) 1·1 in distance from nostril to end of snout (62). Length of anterior teeth of lower jaw (13) 1·9 in eye.

Base of first dorsal, 105 mm.; its height (94) 3·2 in head and less than half depth of body. Second dorsal and anal fins small, subequal.

Base of pectoral, 75 mm.; outer length 184; inner length 37, height 169. Base of ventral 58 mm. Upper caudal lobe 218 mm., lower 170, or 1·28 in upper.

Axilla of pectoral to origin of ventral, 265 mm. Vertical of dorsal origin 65 mm. behind pectoral axilla. Termination of first dorsal to origin of second, 308 mm. Origin of anal to that of ventral, 200. Width of caudal peduncle, including

<sup>1</sup> Agassiz.—Rech. Poiss. Foss., 1835, p. 71, pl. E, fig. 1.

keel, measured half-way between the second dorsal and the caudal, 89 mm.; depth of same, 46.

General shape fusiform, with the snout acutely pointed and the caudal peduncle depressed. Head and body covered with very fine denticles which give in places a sheen comparable to satin. No denticles around pectoral or ventral axillæ. Head one-third of length without caudal, depth about five in same.

Teeth in two functional series flexuous, interjacent, backwardly directed, longest in front of lower jaw, prismatic, with trenchant anterior edges. No basal denticles, no teeth at symphyses.

Dental formula: 
$$\frac{10 + 10}{10 + 10}$$

Palate much plicated. Tongue free, rounded, occupying most of space between teeth in lower jaw. Mouth longer than snout. Upper lip retractile. Nostril above anterior border of jaw. First dorsal originating behind the vertical of the pectoral base, but nearer pectoral than ventral. Second dorsal slightly in advance of anal. A precaudal pit above and below.

*Colours*.—Dark leaden bluish-grey above, whitish below; the junction between the colours fairly well marked.

Described and figured from an immature female, 47 inches in length and originally weighing 27 pounds. Austr. Mus. regd. no. IA.4311; specimen cast.

*Locality*.—Cape district, South Africa; presented by the South African Museum, Cape Town.

Mr. W. J. Phillipps informs me that he has found  $\frac{13 + 13}{13 + 13}$  teeth in a pair of jaws of this species sent to him from South Africa by Mr. C. Biden. I leave this South African form unnamed for the present, but it appears to be closely allied to the Japanese *Isuropsis glaucus* (Müller and Henle) and the "mako" shark, *I. mako* (Whitley) from New Zealand.

#### Family RAJIDÆ.

##### Genus *Raja* Linné, 1758.

##### Subgenus *Cephaleutherus* Rafinesque, 1810.

*Cephaleutherus* Rafinesque, Indice Ittiol. Sicil., 1810, p. 61. Haplotype, *C. maculatus* Rafinesque, *vide* Gill, Proc. U.S. Nat. Mus., xviii, 1896, p. 195.

? *Propterygia* Otto, N.A. Ac. Cæs. Leop. Car., x (1), 1820, p. 120 (*vide* Sherborn, Index Anim.). Type, *P. hyposticta* Otto; a deformed *Raja* (*vide* Jordan, Gen. Fish., i, 1917, p. 117). Also spelt *Propleygia* by Gray, 1851 (*vide* Gill).

*Hieroptera* Fleming, Edinb. New Phil. Journ., xxxi, Oct., 1841, p. 237 (*vide* Sherborn). Orthotype, *H. abredonensis* Fleming; a monstrous *Raja clavata* Linné (*vide* Jordan, Gen. Fish., ii, 1919, p. 209). *Id.* Agassiz, Nomencl. Zool., 1846, Pisces, p. 30, and Index Univ., p. 182; wrongly attributed to Rafinesque, 1810 (Sherborn). *Id.* Radcliffe, Nat. Hist., xxviii, 1, 1928, p. 61, fig. 4 (after Fleming).

*Peroptera* Gistel, Nat. Thierr. höh. Schulen, 1848, p. x. New name for "*Perioptera*, Nob. deleatur." *Id.* Jordan, Proc. Acad. Nat. Sci. Philad., lxx, 1918 (1919), p. 339; and Gen. Fish, ii, July, 1919, p. 238. Not *Peropterus* Partington, 1837 (*vide* Sherborn).

*Perioptera* Gistel, Nat. Thierr. höh. Schulen, 1848, p. x. *Nomen nudum*. *Id.*  
Waterhouse, Index Zool., 1902, p. 278.

*Raja* subg. *Hieroptera* Jordan, Copeia, 142, 1925, p. 37.

Gistel's genus *Peroptera* or *Perioptera* has apparently never been precisely determined, but it seems that these names are merely mis-spellings of *Hieroptera* Fleming, Agassiz. Agassiz was frequently quoted by Gistel, who probably utilized the "Nomenclator Zoologicus" when compiling the lists of genera supplementing his main work in the Nat. Thierr. I therefore regard *Perioptera* and *Peroptera* as synonyms of *Hieroptera*, which is itself apparently synonymous with *Cephaletherus* and probably also with *Propterygia*. These abnormal rays, in which the pectoral fins are separated from the head, have been recently dealt with by Popov in the Bull. Acad. Sci. URSS and by Radcliffe, the last of whose examples is one of the artificially distorted specimens known as Jenny Hanivers.<sup>2</sup>

Family CLUPEIDÆ.

Genus *Harengula* Cuvier and Valenciennes, 1847.

*Harengula lippa*, sp. nov.

(Figure 1.)

D.18; A.21; P.17; V.8, C.19; Sc. less than 40. L.tr.12.

Head (33 mm.) 3.8, depth of body (39.5) 3.1 in length to hypural joint (126).

Eye large, with adipose lids. Mouth lateral, maxillary with two supplemental bones and reaching backwards to below pupil of eye. Minute teeth on jaws and palatines. Vertex of head and, to a less extent, opercula striated. Form elongated, belly compressed and serrated. Scapular area smooth, like sides of head. Body covered with large striated scales with their vertical lines interrupted in the

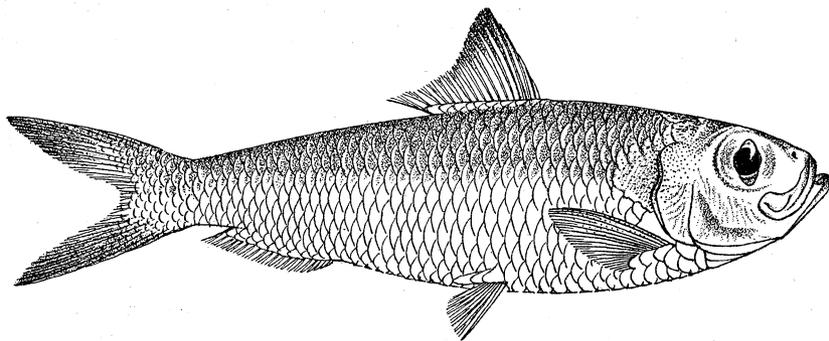


Fig. 1.—*Harengula lippa* Whitley. Holotype from Port Hedland, North-western Australia. Drawing by A. R. McCulloch.

middle. No lateral line. Fifteen preventral and fifteen postventral scales. Less than 40 transverse series of body scales between shoulder and hypural joint. About eleven predorsal scales. Dorsal unique, its origin nearer to snout than to caudal peduncle. Anal short, low, continuous, without produced posterior rays. Pectorals thoracic. Ventrals well developed, their origin behind that of dorsal. Caudal forked.

<sup>2</sup> Whitley.—Austr. Mus. Magazine, iii, 8, 1928, p. 262, 5 figs.

General colour silvery, dark greyish above, with top of head, tip of jaws, and lobes of dorsal and caudal dusky.

Described and figured from the holotype, a specimen 126 mm. in standard length or about  $6\frac{1}{2}$  inches in total length. Aust. Museum regd. no. I.12828; W. Aust. Mus. No. P.18.

*Locality*.—Port Hedland, North-western Australia; received by exchange from the Western Australian Museum in 1913.

This species is allied to *Harengula bulan* (Bleeker, 1849), but differs notably in having more anal rays.

*Harengula maccullochi*, sp. nov.

(Figure 2.)

D.17; A.22; P.17; V.8; C.18; Sc. less than 40 between shoulder and hypural joint. L.tr.12.

Head (38 mm.) 3.3, depth of body (46) 2.7 in length to hypural joint (127).

Eye large, with adipose lids. Minute teeth on jaws and palatines; a group of larger teeth on mandibles anteriorly. Vertex of head, and, to a less extent, opercula, striated. Body rather deep, the lower profile more convex than the upper. Belly compressed and serrated. Scapular area smooth, like most of the head. Body-scales large, deciduous, with the margins striated or irregular, and the subvertical

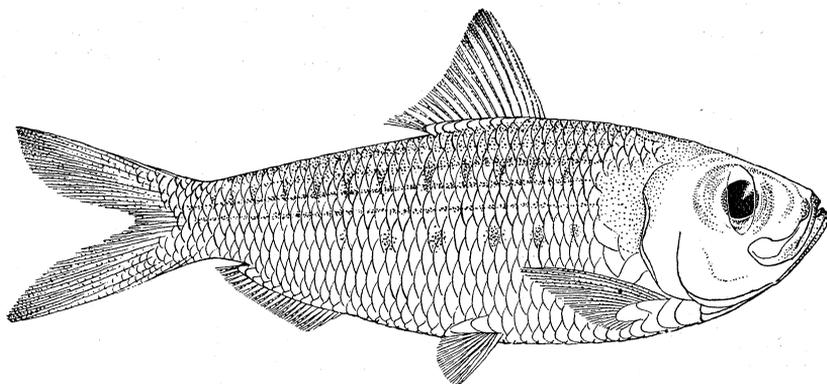


Fig. 2.—*Harengula maccullochi* Whitley. Holotype from Port Hedland, North-western Australia. Drawing by A. R. McCulloch.

lines mostly extending from top to bottom of each scale. Seventeen preventral and twelve postventral scutes and about nine predorsal scales.

Dorsal unique, its origin nearer to tip of snout than to caudal peduncle. Anal without modified posterior rays. Pectorals long, nearly reaching ventral origin, which is below the anterior half of the dorsal fin. General colour silvery, dark greyish above. Some horizontal dusky bars and a row of about thirteen dusky spots along upper part of sides; another row of about six similar ones below them anteriorly. Tips of snout, dorsal, and caudal lobes brownish.

Described and figured from the holotype, a specimen 127 mm. in standard length or about  $6\frac{1}{2}$  inches in total length. Aust. Mus. regd. no. I.12827; W. Aust. Mus. no. P.17.

*Locality*.—Port Hedland, North-western Australia; received by exchange from the Western Australian Museum in 1913.

Distinguished from *Harengula lippa* by its deeper body, different fin and scale counts, and coloration. This new species is a western ally of *Harengula koningsbergeri* (Weber and Beaufort, 1912) from the Aru Islands, but has fewer predorsal scales and dorsal rays and more anal rays.

Named after the late Allan R. McCulloch, who made the drawings of the two new species of *Harengula* here described.

Genus *Amblygaster* Bleeker, 1849.

*Amblygaster posterus*, sp. nov.

D.17; A.14+2; P.16; V.9; C. 15; Sc. *circa* 40. L.tr.11.

Head (49 mm.) nearly 3.6, depth (42) 4.19 in standard length (176).

Eye partly concealed by adipose lids which unite with the skin to give most of the sides of the head a gelatinous appearance. Maxillary extending to below pupil. Teeth on palate and tongue. Border of upper jaw slightly incised. Jaws apparently toothless. Vertex of head with dense patches of striæ behind the eyes. Gill-rakers, fine, elongate, very numerous. Form elongate, robust. Belly not strongly compressed, but with the median ventral scales keeled. Scapular region scaleless and, like parts of the opercula, venulose. Body-scales striated, with the subvertical lines not meeting in the middle of each scale. 20 pre-ventral and 15 post-ventral scutes; about 17 predorsal scales. Dorsal originating nearer to tip of snout than to caudal peduncle. Two posterior anal rays enlarged. Base of anal fin longer than that of dorsal. Bases of anal and caudal fins very scaly. Ventrals originating below median rays of dorsal. Pectorals sub-falciform, almost equal in length to head without snout.

General colour, after long preservation, silvery on the sides, dark greyish above.

Described from the holotype, a specimen 176 mm. in standard length or  $8\frac{3}{4}$  inches in total length. Austr. Mus. regd. no. I.12826; W.A. Mus., no. 10710. This is the largest of a series of six specimens  $7\frac{1}{2}$  inches or more in length.

*Locality*.—Fremantle District, Western Australia; received by exchange from the Western Australian Museum (holotype) and collected by Mr. A. Abjornson of the Fisheries Department of W. Australia (paratypes).

Family SPHYRÆNIDÆ.

Genus *Sphyræna* Bloch and Schneider, 1801.

*Sphyræna leveriana* (Shaw).

*Gadus leverianus* Shaw, Gen. Zool., Pisc., iv, 1, 1803, p. 153. Southern Ocean. *Id.* Swain, Proc. Acad. Nat. Sci. Philad., 1882 (1883), p. 304.

*Gadus leverianus* Shaw was supposed to have come from the "Southern Ocean," collected on Cook's last voyage. Swain was unable to identify this species and other authors seem to have ignored it. If it was really collected on Cook's last voyage, it was evidently not Australian, but perhaps from one of the Pacific islands. Cook<sup>3</sup> mentions, amongst other fishes, "a sort of Pike" caught at Tongatabu in July, 1777, which may be this species. I classify this little known

<sup>3</sup> Cook.—Voy. Pacif. Ocean, i, 1784, p. 335.

species in the genus *Sphyræna* as commonly understood. It is unfortunate that no fishes were included by Shaw in his excellent "Museum Leverianum," published 1792-96, or perhaps the problem of its identity would not have arisen.

Family PTERACLIDÆ.

Genus *Pteraclis* Gronow, 1772.

*Pteraclis* Gronow, Actæ Helveticæ, vii, 1772, p. 43, pl. xi, fig. 1. Orthotype, *P. pinnata* Gronow = *Coryphæna velifera* Pallas (*vide* Jordan, Gen. Fish., ii, 1919, p. 168). Not seen. *Id.* Oken, Lehrb. Naturg., iii (2), 1816, p. 23 (*vide* Sherborn, Index Anim.). *Id.* Cuvier, Règne. Anim. ed. 1, ii, "1817" = Dec., 1816, p. 329. *Id.* Schinz, Das Thierreich (Cuvier), ii, 1822, p. 527. *Id.* Jarocki, Zoologia, iv, 1822, p. 298 (*vide* Sherborn). *Id.* Cuvier and Valenciennes, Hist. Nat. Poiss., ix, 1833, pp. 359 and 363. *Id.* Swainson, Nat. Hist. Classif. Fish, Amphib. Rept., ii, July, 1839, p. 47. *Id.* Gray, Cat. Fish. coll. Gronow Brit. Mus., 1854, p. 170. *Ex* Gronow MS. *Id.* Günther, Cat. Fish. Brit. Mus., ii, 1860, p. 410. *Id.* Jordan, Proc. Acad. Nat. Sci. Philad., 1918 (1919), p. 343, and Ann. Carneg. Mus. xii, 1919, p. 331.

*Pteridium* Scopoli, Intr. Hist. Nat., 1777, p. 454. Haplotype *Coryphæna vellifera* [sic] Pallas. Not *Pteridium* Swainson, Nat. Hist. Classif. Fish. Amphib., Rept. i, 1838, p. 323; Filippi and Verany, 1855; Günther, 1862 = *Oligopus* Risso, 1810 = *Verater* Jordan, Proc. Acad. Nat. Sci. Philad., 1918 (1919), p. 343, a genus of brotulid fishes.

*Oligopodus* Lacépède, Hist. Nat. Poiss. ii, 1800, p. 511, Haplotype, *O. veliferus* Lacépède, based on *Coryphæna velifera* Gmelin [= Pallas]. Not *Oligopodes* Cuvier, Règne Anim. ed 1, ii, "1817" = Dec., 1816, p. 323 = *Oligopodus* Schinz, Das Thierreich (Cuvier), ii, 1822, p. 526 = *Verater* Jordan, Proc. Acad. Nat. Sci. Philad., 1918 (1919), p. 343, a genus of brotulid fishes.

*Pteraclidus* Rafinesque, Anal. de la Nature, 1815, p. 82, substitute for *Oligopodus* Lacépède, 1800 (*vide* Jordan, Gen. Fish., i, 1917, p. 88).

? *Oligopus* Minding, Lehrb. Naturg. Fische, 1832, p. 88. Variant of *Oligopodus* Lacépède (*vide* Sherbon). ? not *Oligopus* Risso, Ichth. Nice, 1810, p. 141 = *Verater* Jordan, Proc. Acad. Nat. Sci. Philad., 1918 (1919), p. 343, a genus of brotulid fishes.

*Pteracles* Swainson, Nat. Hist. Classif. Fish, Amphib. Rept., i, Oct., 1838, pp. 20 and 41, *et ibid.*, ii, July, 1839, pp. 178 and 257. Error for *Pteraclis*.

*Pteroclidus* Agassiz, Nomencl. Zool., 1846, Index Univ., p. 314. Emendation for *Pteraclidus* Rafinesque, 1815.

*Pteroclis* Agassiz, Nomencl. Zool., 1846, Index Univ., p. 314. Emendation for *Pteraclis* Cuvier and Valenciennes, 1833 [= Gronow 1772].

In his "Genera of Fishes," and in earlier papers, Jordan quoted the Zoophylacium of Gronow as the work in which *Pteraclis* was first proposed, but this generic name does not appear either in the Zoophylacium (1763) or Meuschen's Linnean index thereto (1781).

*Oligopus* Risso, 1810, is not congeneric with *Oligopodus* Lacépède, 1800; it is a brotulid fish called *O. ater* in 1810 and *O. niger* in 1826 by Risso. "Les Leptopodes" Cuvier, 1816, vernac., *Oligopodes* Cuvier, 1816, *Leptopodus* Schinz, 1822 (not *Leptopus* Rafinesque, 1814, another genus of fishes), *Oligopodus* Schinz, 1822 (not Lacépède, 1800), *Oligopus* Swainson, 1838, *Pteridium* Swainson, 1838, Filippi

and Verany, 1855, and Günther, 1862 (not Scopoli, 1777), are congeneric with *Oligopus* Risso, 1810, but as none of these names is available, this brotulid genus may be known as *Verater* Jordan, 1919.

*Bentenia* Jordan and Snyder<sup>4</sup> is of doubtful generic status and may be employed as a subgenus for the Japanese species. *Pteraclis velifer* has been figured by Bonnaterre, after Pallas, with the compressed dorsal and anal spines which are supposed to distinguish *Bentenia*.

***Pteraclis velifer* (Pallas).**

*Coryphæna velifera* Pallas, Spicilegia, viii, 1770, p. 19, pl. iii, fig. 1. "Mers des Indes" = Moluccas (*vide* Cuvier). *Id.* Bonnaterre, Tabl. Encycl. Meth. Ichth., 1788, p. 60, pl. xxxiv, fig. 128 (after Pallas). La Mer des Indes.

*Pteraclis pinnata* Gronow, Acta Helvet., vii, 1772, p. 44, pl. xi, fig. 1 (*vide* Sherborn, Index Anim.). Not seen.

*Coryphæna vellifera* (sic) Scopoli, Intr. Hist. Nat., 1777, p. 454. *Ex* Pallas, 1770.

*Coryphæna velifera* Gmelin Syst. Nat. (Linné), ed. 13, i, 3, 1789, p. 1193. *Ex* Pallas. Southern Indian Ocean.

*Oligopodus veliferus* Lacépède, Hist. Nat. Poiss., ii, 1800, pp. 511 and 512. Mers des Indes.

*Pteraclis velifra* (sic) Bloch and Schneider, Syst. Ichth., 1801, p. 143, pl. xxxv; not good—*vide* Cuv. and Val.

*Pteraclis guttatus* Cuvier and Valenciennes, Hist. Nat. Poiss., ix, 1833, p. 370. New name for *Coryphæna velifera* Pallas.

*Pteraclis pinnata* Gray, Cat. Fish. coll. Gronow Brit. Mus., 1854, p. 170. *Ex* Gronow MS. Indian Ocean.

*Pteraclis velifer* Günther, Cat. Fish, Brit. Mus., ii, 1860, p. 411.

Typical species of the genus from the "Southern Indian Ocean."

***Pteraclis* (*Bentenia*) sp.**

*Pteraclis velifer* Ogilby, Rec. Austr. Mus., ii, Sept., 1893, p. 65. New Zealand. *Id.* Waite, Rec. Canterbury Mus., i, 1, 1907, p. 25.

*Pteraclis velifera* Phillipps, Journ. Pan-Pacif. Res. Inst., ii, 1927, p. 13, and N.Z. Mar. Dept. Fish. Bull., i, 1927, p. 35. N. Zealand; listed only. Not *Coryphæna velifera* Pallas, 1770.

*Pteraclis* sp. nov. Phillipps, *in lit.* July 21, 1930.

D.57; A. circa 50; P.19; Vi/3; C.15 branched rays.

Head (76 mm. maximum, or 70 from symphyses) a little over 5 in total length, subequal to pectoral. Eye (20 mm.) equal to snout, nearly 4 in head. Maxillary 33 mm. Width between anterior orbital borders 15 mm. Depth of body, excluding sheaths, 80 mm.; depth of largest sheath scales 11 mm.

Profile obliquely rounded, forehead anterior. Head scaly except on eyes, chin and anterior part of preorbital. Nostrils slightly above horizontal of middle of eye. Opercula broadly rounded. Eight pointed gill-rakers on lower limb of first gill-arch, the longest about one-fourth diameter of eye. An outer and inner row of spaced, simple, curved teeth in each jaw, and a similar row on each palatine. No teeth on vomer, symphyses, or tongue.

<sup>4</sup>Jordan and Snyder.—Journ. Coll. Sci. Tokyo, xv, 1901, p. 306. Orthotype, *B. æsticola* J. and S. Jordan.—Ann. Carnegie Mus., xii, 1919, p. 331.

Body elongate, strongly compressed and tapering, covered with thin leaf-like scales, most of which have an apical notch, in about 52 rows between operculum and hypural joint. The body-scales are largest posteriorly but there is a row of very large scales forming a sheath on either side of the dorsal and anal fins. Scales adherent and with fine longitudinal striations.

Dorsal fin originating at tip of snout; anal originating below eye. Both these fins have long bases and are composed of spines which are short posteriorly but very long anteriorly, almost reaching the caudal when adpressed. Some of them are unfortunately broken in my specimens. Third and fourth dorsal and first and second anal and pectoral spines compressed. Ventral spine filiform, the rays small. Pectorals pointed. Caudal strongly forked. The fins are fragile and all are to some extent damaged.

General colour, after long preservation in "acid" and later in alcohol, dark green with the scales silvery and the membranes of the dorsal and anal uniform brown.

Described from a specimen 340 mm. in length to hypural or about 15½ inches in total length. Austr. Mus. regd. no. I.2980.

*Loc.*—New Zealand; purchased 1891.

There is a second New Zealand specimen in the Australian Museum (No. I.2915); only the head and anterior part of body and fins have been preserved. This specimen has a few teeth on vomer, seven branchiostegals, anterior anal membranes whitish distally, and numerous small circular white spots on dorsal and anal membranes.

Ogilby was the first to record *Pteraclis* from New Zealand and the specimens described above were doubtless the basis of his record.

So far as may be gleaned from a study of the literature on *Pteraclis* and in the absence of more specimens, it can only be said that the New Zealand species shows only minor variation from *P. velifera*, but I leave it specifically unnamed as my colleague, Mr. W. J. Phillipps, intends to deal with further New Zealand specimens, which he regards as belonging to a new species.

#### Family ISTIOPHORIDÆ.

##### Genus *Istiompax* Whitley, 1931.

*Istiompax* Whitley, Austr. Zool., vi, 4, Feb. 13, 1931, p. 321. Orthotype, *I. australis* Whitley.

In the Black Marlin Swordfish of New South Wales, the type of this genus, the anterior spines of the first dorsal fin are much longer than the posterior. This feature separates *Istiompax* from *Istiophorus* Lacépède, 1802 (synonyms: *Nothistium* Herrmann, *Histiophorus* Cuvier, and *Notistium* Jordan) and *Zanclurus* Swainson, 1839. *Makaira* Lacépède, 1803, is based on an unsatisfactory diagnosis of a European swordfish which appears very dissimilar from our Black Marlin. *Tetrapturus* Rafinesque, 1810 (syn. *Tetrapterus* Agassiz and *Skeponopodus* Nardo), is said to be based on *T. belone* Rafinesque, but Cuvier and Valenciennes' figure of this species shows a fish with the posterior dorsal rays about half as long as the anterior, whereas they are much less than that in *Istiompax*. *Martina*<sup>5</sup> Grey, 1928, is distinguished by its striped body and reduced scales, and the Striped Marlin Swordfish of New Zealand, which has been called

<sup>5</sup> Grey.—Natural History, xxviii, 1, 1928, p. 47. Haplotype, *M. mitsukurii* Jordan and Snyder. See also Whitley, REC. AUSTR. MUS., xvii, 3, 1929, p. 101.

*Makaira mitsukurii*, would be better termed *Marlina zelandica* (Jordan and Evermann) on zoogeographical grounds. A new generic name may be required for the Japanese swordfish figured by Tanaka<sup>6</sup> with its elevated posterior dorsal spines, short snout and short pectorals.

Probably the Black Marlin Swordfishes of New South Wales, Tasmania and New Zealand are conspecific, as they are migratory fishes. For the present, they may be called *Istiompax australis*, but as actual comparison of specimens is at present impracticable, I restrict the following account to the New South Wales species, which I have studied from excellent specimens. A series of measurements from three examples is given in the hope that further such series may be drawn up from other specimens for comparison when opportunity arises.

#### *Istiompax australis* Whitley.

*Histiophorus gladius* Ramsay, Proc. Linn. Soc. N. S. Wales, v, 3, Feb., 1881, pp. 295 and 522, pl. viii. Male holotype of *Istiompax australis* Whitley, 13 ft. 4 in. long, in the Australian Museum. Off Wollongong, New South Wales; July 4, 1880. *Id.* Tenison-Woods, Fish. Fisher. N. S. Wales, 1882, p. 55. Not "*Scomber gladius* Broussonet, Mem. Acad. Sci., 1786, p. 454, pl. x," which, according to authors, is a species of *Istiophorus*, but Mr. C. D. Sherborn states (*in lit.*) "Pure invention, no such name occurs." I have not seen this paper.

*Tetrapturus indicus* Waite, Mem. Nat. Club N.S.W., 1904, p. 42 (N.S.W.). *Id.* Stead, Fish. Austr., 1906, p. 170, fig. 61 (Manly, N.S.W.). *Id.* Stead, Edib. Fish. N. S. Wales, 1908, p. 100, pl. lxxvii (Port Jackson, N.S.W.). *Id.* McCulloch, Austr. Zool., ii, 1921, p. 80; Austr. Zool. Handbook, i, 1922, p. 80, pl. xxxiv, fig. 297a. Not *T. indicus* Cuv. and Val., 1831, from "southern seas."

*Makaira mazara* Griffin, Trans. N.Z. Inst., lviii, 1927, p. 141, pl. xiii, fig. 5. *Id.* McCulloch, Austr. Mus. Mem., v, 2, 1929, p. 266. Not *Tetrapturus mazara* Jordan and Snyder, 1901, from Japan.

*Tetrapturus herschelii* McCulloch, Austr. Mus. Mem., v, 1929, p. 266. Not *Tetrapturus herschelii* Gray, 1838, from South Africa.

*Istiompax australis* Whitley, Austr. Zool., vi, 1931, p. 321. Off Wollongong, N.S.W. Type in Austr. Mus. [Ex *Tetrapturus australis* Macleay MS.]

The fin-formulae and measurements, from which the proportions may be worked out, are given in the accompanying table.

Some scales behind eye and on cheeks and temples; rest of head naked. Scattered rudimentary scales on eye and between dorsal spines. Rugose teeth on jaws, vomer, palatines, tongue, gill-arches, etc. The small free portion of tongue with rounded margin. A peg behind gill-cover. The skin of the body closely set with elongate, curved scales. Lateral line present as a naked streak with minute close-set pores; it extends in a straight line along the centre of the body from the middle of the caudal peduncle to above the middle of the pectoral, where it curves upwards to the angle of the operculum.

General colour of a specimen from Manly, N. S. Wales, light bluish-grey, without vertical stripes. First dorsal fin brownish, with some dark spots between lower halves of spines. Second dorsal greyish.

<sup>6</sup>Tanaka.—Fishes of Japan, xviii, Nov. 18, 1914, pl. lxxxviii, fig. 285; xix, Feb. 28, 1915, p. 324, as *Tetrapturus angustirostris*.

Colour of a Port Stephens specimen noted by McCulloch and later macerated, dark slate above, silvery white below. All the lower half, including the fins, with traces of bright silver. Side of head, branchiostegals, and a triangular patch behind the pectorals, silver. Bony portion of eye silver; iris golden. Dorsals dark slaty black, similar to the pectorals, ventrals, and caudal fins. Anal fins lighter in tone.

	Ramsay's (and my) type from Wollongong, N.S.W.	Specimen from Manly, N.S.W.	Small Specimen from Port Stephens, N.S.W.
	Ft. In.	Ft. In.	Ft. In.
Total length to end of middle caudal rays .. .. .	13 4	13 1	6 3½
Total length to tip of tail .. .. .	14 0	—	6 8
Upper lobe of caudal fin } from	2 9	2 8	—
Lower lobe of caudal fin } caudal pits {	2 7	2 6	—
Breadth of expanded caudal .. .. .	—	—	2 1½
Length of caudal keel .. .. .	0 5½	0 4½	—
Depth of caudal keel .. .. .	0 2½	0 1½	—
Height of body opposite dorsal fin .. .. .	2 6	1 10½	0 11
Height of body at origin of anal fin .. .. .	—	—	0 9
Height of first dorsal from base .. .. .	1 6	1 0½	—
Height of second dorsal from base .. .. .	0 5	0 3	longest (4th) ray, 8¼ in. 7th ray, 6 in.
Extent of second dorsal at base .. .. .	1 2½	0 8	—
Length of pectoral fin .. .. .	2 4	2 2	1 1½
Its width at the base .. .. .	0 7	0 5	—
Its width four inches from the body .. .. .	0 5	0 4½	—
Length of ventral fin .. .. .	—	—	0 10½
Snout from nostril .. .. .	2 7	2 7½	—
Length of head from nostril to hinder margin of gill-cover .. .. .	1 8	1 9	—
Length of head, with snout .. .. .	4 5	4 4½	2 2½
From tip of snout to centre of eye .. .. .	2 10	2 10½	1 6
From centre of eye to gill-cover .. .. .	1 4½	1 6	—
First anal fin .. .. .	1 2	—	—
Second anal fin .. .. .	0 4½	0 6 (last ray)	—
Breadth of body at first anal .. .. .	2 0	—	—
Least depth of caudal peduncle .. .. .	—	—	0 2½
Length of lower mandible to gape .. .. .	1 4½	1 7	—
Lower mandible to gill-cover .. .. .	1 9	3 0	1 4½
Snout projects beyond lower jaw .. .. .	—	—	0 10
Tip of snout to pectoral fin .. .. .	2 2½	4 4½	—
Tip of snout to first dorsal .. .. .	4 0	3 10	—
Tip of snout to gape .. .. .	3 2	2 11½	—
Horizontal diameter of orbit .. .. .	0 3	0 3	0 1½
Vertical diameter of orbit .. .. .	0 2	0 2½	0 1½
Dorsal formula .. .. .	35/7	35/2/9(10)	39/7
Anal formula .. .. .	12-13/6	?	14/7
Ventral formula .. .. .	1	1	1/1
Pectoral formula .. .. .	?	?	20
Branchiostegals .. .. .	—	—	7

Description and dimensions based on three specimens from the following localities:

Off Wollongong, New South Wales; July 4, 1880. Holotype of *Istiompax australis*

Whitley, figured by Ramsay. Male, 13 ft. 4 in. long, in Australian Museum.

Manly, near Sydney, New South Wales; Sept., 1930. A specimen 13 ft. 1 in. long, not preserved, but examined by the writer when fresh.

Port Stephens, New South Wales; date? Small example, 6 ft. 3½ in. long.

The last specimen was received by the late A. R. McCulloch from Dr. M. Lidwill and was regarded by him as belonging to the same species as Ramsay's specimen. Dr. Lidwill supplied the following details:

"On the capture of this fish, there were two Remora sticking on to it, and the stomach was full of pilchards and worms about the thickness of a piece of

thread and about  $2\frac{1}{2}$  inches long. It was taken midway between Entrance to Port Stephens and Broughton Island, during a south-easterly gale. Caught on a rod by trailing a mullet at two knots about sixty yards behind boat, on fine steel piano wire on a treble hook; caught in the tongue and showed no fight. Seventy pounds weight when fresh and 6 feet 8 inches long."

Describing the capture of the Wollongong specimen, Ramsay remarks:

" . . . A large sword fish in pursuit of a schnapper got entangled in the anchor line which had become twisted round its snout, thereby affording an opportunity for Mr. Andrews to harpoon it . . . ; after towing the boat for several miles the animal became exhausted and was in turn towed ashore. Shortly after being harpooned the fish disgorged a number of large schnapper, . . . [*Chrysophrys guttulatus*] . . . and finally threw out the stomach itself. During the engagement it was seen to leap several feet in height out of the water."

Precise details of the capture of the Manly specimen were not available. I borrowed the specific name of this swordfish from the earliest account of it I could find. This was a manuscript note of a donation by Sir William Macleay in one of the old minute-books of the Australian Museum, as follows:

"*Tetrapturus australis* . . . . March 4, 1854. Broken Bay, N. S. Wales." Also "In August, 1854, The Sydney and Melbourne Steam Packet Company presented portion of the sword of a *Tetrapturus* found in the hull of S.S. *Governor General*, with a portion of the timber  $3\frac{1}{2}$  in. thick, with a written description of the particulars."

The parasites infesting this species have been noted in Ramsay's paper. The worms mentioned by Lidwill (*supra*) were doubtless nematoda. No parasites were observed on the Manly specimen.

*Istiompax australis* evidently feeds on oceanic fishes, such as the rocky coast-haunting snapper and the pelagic pilchard, but opinions differ as to its qualities as a game fish.

#### Family ACINACEIDÆ.

##### Genus *Thyrsites* Cuvier and Valenciennes, 1832.

? *Acinacea* Bory de St. Vincent, Voy. îles Afriq., i, 1804, p. 93; Dict. class. d'Hist. Nat. i, 1822, p. 93. Haplotype, *A. notha* Bory, which may be an incorrectly described *Thyrsites atun* (with 29 dorsal spines) from Africa. Name emended to *Acinaces* by Agassiz, 1846. Not *Acinaces* Gerstaecker, 1858, a genus of Coleoptera.

"*Les Thyrsites*" Cuvier, Règne Anim., ed. 2, ii, April, 1829, p. 200. Vernac.

*Thyrsites* Cuvier and Valenciennes, Hist. Nat. Poiss., viii, "1831" = Jan., 1832, p. 196. Logotype, *Scomber atun* Euphrasen, selected by Gill, Proc. Acad. Nat. Sci. Philad., 1862, p. 126. *Id.* Voigt, Das Thierreich (Cuv.), ii, 1832, p. 281. *Id.* Baudement, Dict. Univ. d'Hist. Nat. (D'Orbigny), xii, "1861" = 1848 (*vide* Sherborn, 1899), p. 572. *Id.* Alcock, Cat. Deep-Sea Fish. Investigator, 1899, p. 41.

*Leionura* Bleeker, Nat. Tijdschr. Ned. Ind., xxi, 1860, p. 68. *Ex* Kuhl and van Hasselt MS. Haplotype, *L. esox* (K. and v. H.) Bleeker = *Thyrsites atun*.

*Thersites* McCoy, Prodr. Zool. Vict., dec. v, 1880, p. 19. Error for *Thyrsites*. Not *Thersites* Spence-Bate, 1857, a genus of Amphipoda; nor *Thersites* Pagen-

stecher, 1861, a genus of Entomostraca; nor *Thersites* Pfeiffer, Mal. Blätter, ii, Dec., 1855, or Jan., 1856, p. 141, a genus of Australian terrestrial mollusca.

Bleeker introduced *Leionura esox* as a nude name *ex* Kuhl and van Hasselt's manuscript illustration, in the synonymy of the South African *Thyrsites atun*, so the generic name *Leionura*, which has been generally overlooked, is hereby designated an absolute synonym of *Thyrsites* Cuv. and Val.

***Thyrsites atun* (Euphrasen).**

"*Paracutus*" Cook, [Third] Voy. Pacific Ocean, i, 1784, p. 152 (New Zealand).  
Vernacular.

*Scomber atun* Euphrasen, K. Vet. Akad. Nya. Handl., xii, 1791, p. 315 (*vide* Sherborn, Index Anim.). Cape of Good Hope (type-loc.) and Java. *Id.* Lacépède, Hist. Nat. Poiss., v, 1803, p. 679, and as vernac. in Hist. Nat. Quadr. ovip., iii, 1836, suppl. p. 309.

*Scomber dentatus* Bloch and Schneider, Syst. Ichth., 1801, p. 24. *Ex* J. R. Forster MS. [Queen Charlotte Sound,] New Zealand. Dorsal spines 20-23. *Id.* Richardson, Rept. 12th meet. Brit. Assn. Adv. Sci., 1842 (1843), p. 20.

? *Acinacea notha* Bory de St. Vincent, Voy. îles Afriq., i, 1804, p. 93; Dict. Class. d'Hist. Nat., i, 1822, p. 93. Off the African coast.

*Thyrsites atun* Cuvier and Valenciennes, Hist. Nat. Poiss., viii, "1831" = Jan., 1832, p. 196, pl. ccxix. Cape of Good Hope. Seven dorsal and six anal finlets. *Id.* Cuvier, Règne Anim. (disciples' ed.), 1836, pl. xlix, fig. 1. Seven dorsal and seven anal finlets, and high anterior dorsal. Cape of Good Hope. *Id.* Richardson, Rept. 12th meet. Brit. Assn. Adv. Sci., 1842 (1842), pp. 20 and 21. *Id.* Bleeker, Verh. Akad. Amsterdam, ii, 1855, p. 10. Tasmania. *Id.* Bleeker, Nat. Tijdschr. Ned. Ind., xxi, 1860, p. 68. Cape. *Id.* Günther, Cat. Fish. Brit. Mus., ii, 1860, pp. 350 and 527. Seven finlets and seven pyloric appendages. *Id.* Castelnau, Proc. Zool. Acclim. Soc. Vict., i, 1872, p. 103. Victoria. Six dorsal finlets. *Id.* Klunzinger, Sitzb. Akad. Wiss. Wien, lxxx, 1879, p. 375 (Murray R. and Hobson's Bay, Vict.). *Id.* Sauvage, Arch. Zool. Exper., viii, 1879, pp. 3 and 29 (St. Paul and Australia). *Id.* Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), pp. 81 and 117; *ibid.*, 1890 (1891), p. 32. Tasmania; six finlets, vertebræ 37. *Id.* Lucas, Proc. Roy. Soc. Vict. (n.s.), ii, 1889 (1890), p. 23. *Id.* Tenison-Woods, Fish. Fisher N. S. Wales, 1882, p. 56. Tasmania; fishing. *Id.* Ramsay, Cat. Exhib. N. S. Wales Court Internat. Fisher. Exhib., 1883, p. 12. *Id.* Saville-Kent, Natural. in Austr., 1897, p. 170, pl. xxviii, fig. 2. *Id.* Anderson, Guide Fishing Tasm., 1900, p. 47. *Id.* Waite, Rec. Austr. Mus., v, 1903, p. 56 (Coogee, near Sydney; new record for N. S. Wales). *Id.* Stead, Fish. Austr., 1906, pp. 166 and 264, fig. 60. *Id.* Waite, Rec. Canterb. Mus., i, 1907, p. 24; *ibid.*, 1911, p. 235. New Zealand; feeds on *Hemerocætes*. *Id.* Stead, Edible Fish. N. S. Wales, 1908, p. 99. *Id.* Johnston, Abstr. Proc. Linn. Soc. N. S. Wales, No. 280, Nov. 24 (publ. Nov. 26), 1909, p. i (Entozoa named and recorded from Australia). *Id.* McCulloch, Zool. Res. Endeavour, i, 1911, p. 80. Flinders Id., Bass Strait and west of Kingston, South Australia; new record for S.A. *Id.* Weber, Fische Siboga-Exped., 1913, p. 407. Makassar and Buru; perhaps a distinct species—G.P.W. *Id.* Regan, Brit. Ant. Exp. Zool., i, 1, 1914, p. 16; *ibid.*, i, 4, 1916, p. 144, pl. viii, figs. 1-3. Larvæ from Cape North, N.Z. About 35 vertebræ; 18-20 dorsal

- spines. *Id.* Gilchrist, S. Afr. Mar. Biol. Rept., ii, 1914, p. 116 and fig.; *ibid.*, iii, 1916, pp. 8 and 23 (egg; habits and statistics in S. Africa; seven dorsal and anal finlets. *Id.* Waite and McCulloch, Trans. Roy. Soc. S. Aust., xxxix, 1915, p. 465. South Australia; poor condition. *Id.* Roughley, Fish. Austr. and Tech., 1916, p. 166. *Id.* Thompson, S. Afr. Mar. Biol. Rept., iv, 1918, p. 113. Refs. *Id.* McCulloch, Rec. Austr. Mus., xiii, 4, 1921, p. 139, pl. xxiv, fig. 2. Sydney; five, usually six, dorsal and six anal finlets. *Id.* Phillipps, N.Z. Journ. Sci. Tech., iv, 3, 1921, pp. 118 and 124. New Zealand; occurrence and spawning. *Id.* Waite, Rec. S. Austr. Mus., ii, 1921, p. 144, fig. 226. S. Australia, but a New Zealand specimen, with seven dorsal and six anal finlets, is figured. *Id.* Phillipps and Hodgkinson, N.Z. Journ. Sci. Tech., v, 2, 1922, p. 94. Auckland, N.Z.; spawns in August. *Id.* McCulloch, Austr. Zool., ii, 1922, p. 107, fig. 301a; Austr. Zool. Handbook, i, 1922, p. 81, fig. 301a. N.S.W. *Id.* Fowler, Proc. Acad. Nat. Sci. Philad., lxxv, 1923, p. 43. Melbourne. *Id.* Waite, Fish. S. Austr., 1923, pp. 109 and 167, fig. Vernac. names and fishing. *Id.* Lord and Scott, Synops. Vert. Anim. Tas., 1924, p. 81, and fig. opp. p. 87, of a Tasmanian specimen. *Id.* McCulloch, Illustr. Austr. Encycl., i, 1925, p. 135, and fig. *Id.* Barnard, Ann. S. Afr. Mus., xxi, 1927, p. 788, pl. xxix, fig. 4. *Id.* Hughes, Proc. Roy. Soc. Vict. (n.s.), xli, 1, 1928, p. 49. San Remo, Victoria; trematode worm from gills. *Id.* Whitley, Rec. Austr. Mus., xvii, 1929, p. 119. *Id.* McCulloch, Austr. Mus. Mem., v, 1929, p. 268.
- Scomber lanceolatus* Cuvier and Valenciennes, Hist. Nat. Poiss., viii, "1831" = Jan., 1832, p. 204. *Ex* Forster, MS. Queen Charlotte Sound, N. Zealand. 20-23 dorsal spines. *Id.* Richardson, Trans. Zool. Soc. Lond., iii, 1, 1842, p. 120.
- Thyrsites altivelis* Richardson, Proc. Zool. Soc. Lond., vii, Nov., 1839, p. 99. Port Arthur, Tasmania. Type in British Museum. Seven dorsal and anal finlets. *Id.* Richardson, Tasm. Journ. Sci., i, 1842, pp. 99 and 108.
- Thyrsites atten* Richardson, Proc. Zool. Soc. Lond., vii, Nov., 1839, p. 99; Tasm. Journ. Sci., i, 1842, p. 108. Error for *T. atun*.
- Thyrsites atun* var. *altivelis* Richardson, Trans. Zool. Soc. Lond., iii (i), 1842, p. 119. Detailed description of Tasmanian specimen and comparison with *T. atun*.
- Scomber splendens* Richardson, Rept. 12th meet. Brit. Assn. Adv. Sci., 1842 (1843), p. 20. *Ex* Solander MS. Murderers' Bay, New Zealand.
- Scomber dentex* Richardson, Rept. 12th meet. Brit. Assn. Adv. Sci., 1842 (1843), p. 20. *Ex* Forster MS. Queen Charlotte Sound, New Zealand. Name pre-occupied by *S. dentex* Bloch and Schneider, Syst. Ichth., 1801, p. 30. *Id.* Forster, Descr. Anim. (ed. Lichtenstein), 1844, p. 141. New Zealand. Equivalent to *Scomber dentatus* Bloch and Schneider, 1801, p. 24 (not *S. dentex*, p. 30).
- Lucoscombrus atun* van der Hoeven, Handbook of Zoology (trans. Clark), ii, 1858, p. 161 (Cape); see also Whitley, Rec. Austr. Mus., xvii, 1929, p. 119.
- Leionura esoæ* Bleeker, Nat. Tijdschr. Ned. Ind., xxi, 1860, p. 68. Name in synonymy *ex* Kuhl and van Hasselt MS. Type locality hereby designated South Africa, so as to make this name an absolute synonym of *Thyrsites atun* (Euphrasen).

*Trichiurus atun* Sauvage, Archiv. Zool. Exper., viii, 1879, p. 28. Error for *Thyrsites atun*.

*Thersites atun* McCoy, Prodr. Zool. Vict. dec. v, 1880, p. 19, pl. xliiv, figs. 1, 1a-b (not 1c-d). Victoria. Six dorsal and anal finlets.

The foregoing represents an attempt to tabulate the synonymy and bibliography of the Barracouta, which is of considerable commercial value in Australia and New Zealand. This Barracouta, or 'couta, as it is generally termed, is quite different from the Barracuda of the West Indies, which is a Sphyrænoïd fish. The South African Barracouta is known as Snoek whilst the Maori name for the New Zealand form is Manga. In South Australian waters, where barracouta are caught in poor condition, they are called "Axe-handles."

Apparently the genus *Thyrsites* is circum-Antarctic in distribution and is thus of considerable zoogeographical interest. The Australian Barracouta agrees well with the accounts of the typical *T. atun* from South Africa, but as the number of finlets and spines is sometimes more, should perhaps be distinguished as a subspecies, *T. atun altivelis* (Richardson). Several names are available for the New Zealand form and this, if distinct, will be named *T. atun dentatus* (Bloch and Schneider). The South American *T. chiliensis* Cuv. and Val. is not included in the above synonymy, although some authors have suggested its identity with *T. atun*.

The excellent figures given by Cuvier and Valenciennes, McCoy, and McCulloch render further illustrations superfluous at present.

The numbers of fin-spines, rays, and finlets, and the counts of vertebræ may be subject to constant variation in different regions and might well form the subject of statistical studies to determine racial limits in these fishes. So far, little has been done along these lines.

The Barracouta (*Thyrsites atun* formæ *dentatus* and *altivelis*) ranges from New Zealand to south-eastern Australia, where it is found from South Australia (mostly diseased specimens) to New South Wales (there is one record from Moreton Bay, Queensland). The species is evidently commonest in waters between south-eastern Tasmania and New Zealand, or in Victoria, but it seems that Tasmania or New Zealand would serve best as bases for its fishery. If the Australasian species be the same as the South African Snoek (*Thyrsites atun atun*), then this species also occurs in the waters of South Africa, Tristan d'Acunha, and St. Paul. The East Indian and Chilean forms of *Thyrsites* are doubtless distinct species; the former is apparently an unnamed species and the latter, *T. chiliensis* Cuv. and Val.

Mr. S. Fowler, Secretary of the Australian Fisheries Conference, Prime Minister's Department, Melbourne, remarks in a letter to me dated 11th August, 1930: "Because of their abundance and of the fact that the craft used for their capture is of the small, inshore type, Barracouta are necessarily taken from inshore waters, but I have been informed by fishermen that they have been caught in large quantities 20 miles south of Tasmania. To supply the present edible demand there is no need for fishermen to go far afield, but my own belief is that they exist in great quantities over a very wide area and at great distances from shore. I have a very high opinion of the potential economic value of these fish."

## Family POMACENTRIDÆ.

## Subfamily PARMINÆ.

Genus *Parma* Günther, 1862.*Parma unifasciata* (Steindachner).

*Pomacentrus unifasciatus* Steindachner, Sitzb. Akad. Wiss. Wien, lvi, 1, 1867, p. 326, Port Jackson, New South Wales. Not *P. unifasciatus* Kner (Sitzb. Akad. Wiss. Wien, lviii, 1868, p. 31), from Fiji = *Pellochromis xanthosoma* (Bleeker). *Id.* Castelnau, Proc. Linn. Soc. N. S. Wales, iii, 1879, p. 354. *Id.* Ogilby, Cat. Fish. N. S. Wales, 1886, p. 43 (not synonymy). *Id.* McCulloch, Austr. Zool., ii, 3, 1922, p. 95, and Aust. Zool. Handbook, i, 1922, p. 69.

*Parma unifasciatus* Whitley, Mem. Qld. Mus., ix, 3, 1929, p. 243. *Id.* McCulloch, Austr. Mus. Mem., v, 2, 1929, p. 302.

D.xiii/18; A.ii/15; P.i/20; V.i/5; C.13. L.lat. 25 tubes + 8 punctured scales. L.tr.4/1/14.

Head (45 mm.) 3.14, depth (73) 1.9 and depth of caudal peduncle (22.5) 6.3 in length to hypural joint (142). Eye (10.5) 4.2, interorbital (17) 2.6 in head.

Profiles convex. Head higher than long and longer than broad. Eye rather small. Rugosities on the suborbital, supraorbital, and preorbital, and between the nostrils; others on the opercular flap and along the limb of the preoperculum, the latter tending to make the margin irregular and almost denticulate. Preorbital deeply notched anteriorly and forming a less noticeable notch where it meets the suborbital. Jaws subequal, with fleshy lips. A series of adjacent, compressed teeth in each jaw. Five branchiostegal rays, the lowermost small, the membranes broadly united across the isthmus. About eleven short, curved, pointed gill-rakers on lower limb of first gill-arch. Head scaly, except on snout, mouth, chin, throat and opercular margins. Top of head with numerous auxiliary scales. Nostril a simple opening half-way between eye and tip of snout.

Body ovate, robust, covered with broad, imbricate, ciliated scales, which extend on to the basal portions of all the fins except the ventrals. Lateral line rising obliquely to below the last dorsal spine, then curving steeply downward, its last tube below the median dorsal rays. Some caudal peduncle scales minutely punctured. About thirty transverse rows of body-scales between operculum and hypural joint.

Dorsal originating in advance of ventrals and pectorals and terminating behind anal; membranes of spinous portion with small pencils. Fifth and sixth spines longest, but not nearly so long as the longest (fifth and sixth) rays. Soft dorsal forming a high pointed lobe. Second anal spine shorter than most of the dorsal spines; the soft fin with a rounded margin. Pectorals shorter than head. Ventrals pointed, reaching beyond vent. Caudal lobes rounded, the upper considerably longer than the lower.

General colour, in alcohol, chocolate brown, darkest on the fins. A light brown patch on the posterior portion of the operculum. A light brown band extends from the bases of the eighth to tenth dorsal spines to the vent and anal origin and is broadest on the lower part of the sides. The caudal peduncle and posterior portion of the trunk are also light brown to a less extent, but no band is differentiated. Pale whitish spots underlie many of the body-scales. Snout and chin dark, breast and pectoral margin light in tone.

Described from a specimen 142 mm. in standard length or seven inches in total length. Australian Museum regd. no. IA.553.

*Loc.*—Washed up on Bondi Beach, near Sydney, New South Wales, after a storm, in January, 1922, and collected by Messrs. R. Hawkins and W. Barnes.

Two other specimens 125–146 mm. in standard length are in the Australian Museum from near Sydney. The smaller (IA.4880) was collected at Vaucluse, Port Jackson, by Mr. T. C. Roughley in March, 1931, and the larger (I.6848) at Maroubra by Mr. R. Rolleston some years ago. These agree with the specimen described above. The banded body and rugose snout and opercula are distinguishing features of this species, which seems to be commoner off the coast near Sydney than has hitherto been supposed.

#### Family LABRIDÆ.

Genus *Pseudolabrus* Bleeker, 1862.

*Pseudolabrus cyprinaceus* (White).

*Labrus cyprinaceus* White, Journ. Voy. New S. Wales, 1790, append., p. 264, pi. —, fig. 1. [Botany Bay or Port Jackson] New South Wales.

? *Labrus cyprinoides* Labillardière, Voy. rech. La Perouse, i, 1800, p. 419; *ibid.* (English translation), i, 1800, p. 472. Nomen nudum vel errore pro *L. cyprinaceus* White. 33° 55' S. lat., 119° 32' E. long.; several caught while vessel was at anchor.

*Labrichthys gymnogenis* Günther, Cat. Fish. Brit. Mus., iv, 1862, pp. 117 and 507. Australia. Type in British Museum.

*Labrichthys nigromarginatus* Macleay, Proc. Linn. Soc. N. S. Wales, iii, 1, Sept., 1878, p. 35, pl. iii, fig. 3. Port Jackson, New South Wales. Type in Macleay Museum, University of Sydney.

*Pseudolabrus gymnogenis* Roughley, Fish. Austr. Tech., 1916, p. 155, pl. liii; and of eastern Australian authors generally.

The name *Labrus cyprinaceus* White is evidently based on an old faded specimen of the Crimson-banded or White-spotted Parrot Fish of New South Wales, as the dark marks, radiating from the eye, as shown in White's figure, are often characteristic of this common and variable Sydney species. Thus White's name has priority over *Labrichthys gymnogenis* Günther and the fish should now be called *Pseudolabrus cyprinaceus* (White).

A Western Australian form of this species, apparently unnamed, perhaps formed the basis of Labillardière's *Labrus cyprinoides*; this name may best be disposed of by being regarded as a variant of *L. cyprinaceus* White.

#### Family GOBIIDÆ.

Genus *Lebetus* Winther, 1877.

*Lebetus* Winther, Naturhistorisk Tidsskrift Kjöbenhavn (3), xi, 1877, p. 49. Virtual haplotype, *Gobius scorpioides* Collett. *Id.* Smitt, Öfvers. K. Vetensk.-Akad. Förh., lvi, 1899, p. 554. *Ex* Winther. Cheek longer than postorbital part of head; male *G. scorpioides* = *G. orca* Collett. *Id.* Jordan, Gen. Fish., iii, 1919, p. 392. *Id.* F. de Buen, Trab. Inst. Esp. Oceanogr., v, 1930, pp. 5 and 21.

*Lebistes* Jordan, Gen. Fish., iv, Aug. 15, 1920, p. 487. Error for *Lebetus* Smitt. Orthotype, *L. scorpioides* Smitt = *Gobius scorpioides* Collett. Preoccupied by *Lebistes* Filippi, Arch. Zool. Anat. Fisiol., i, 1861–2, p. 69, another genus of fishes (*vide* Jordan, Gen. Fish., iii, 1919, p. 301; Classif. Fish., 1923, p. 158).

*Butigobius* Whitley, Austr. Zoologist, vi, 2, Jan. 14, 1930, p. 123. Orthotype, "*Lebistes scorpioides* Smitt" = error for *Gobius scorpioides* Collett.

Jordan (1920) quotes "*Lebistes* Smitt, 543; orthotype L. SCORPIOIDES Smitt. Not *LEBISTES* Filippi, 1862." His remarks on the [sub-] generic names in Smitt's 1899 paper are, however, rather misleading, as comparison with the copy in the Australian Museum library shows that wrong page numbers and other errors in quotation are made by Jordan. The new subgenera of *Gobius* proposed by Smitt, with their pages and types are:

Page 544. *Proterorhinus*. Haplotype, *Gobius marmoratus* Pallas [and vars.].

Page 545. *Eichwaldia*. Haplotype, *G. caspius* Eichwald [name preocc., replaced by *Eichwaldiella* Whitley, 1930].

Page 551. *Caffrogobius*. Orthotype, *G. nudiceps* [Cuv. and Val.].

*Mapo*. Haplotype, *Mapo soporator* (Cuv. and Val.) [including formæ].

Page 552. *Mugilogobius* [subgenus cælebs]; "from India and Japan." [Logotype, *Ctenogobius abei* Jordan and Snyder (*idæ* Jordan).]

On page 554, Smitt gave the characters of "*Lebetus*, WINTHER.—*Gobius scorpioides*, COLL. (♂ = *Gob. orca*, COLL.)," and this is apparently the basis of Jordan's erroneous reference to *Lebistes* quoted above. Misled by the latter, and through not consulting Smitt's work, which was not available at the time, I proposed *Butigobius* in 1930 as a new name for "*Lebistes* Smitt," but my genus now becomes a synonym of *Lebetus* Winther, 1877.

My friend Mr. Anton Bruun, M.Sc., of Copenhagen, has very kindly furnished me with a copy of Winther's description of *Lebetus* and a translation into English of the same, as follows:

"The other one of the two species new to our fauna, *Gobius scorpioides* Collett, is here made a representative of a new genus. The separation of this species together with the nearly related *Gob. orca* (Collett) from *Gobius* Cuv. is based upon this peculiarity, that both species are lacking the main distinguishing character, the funnel-shaped fused ventrals, by which the genus *Gobius* from Cuvier's time has been sharply separated from the most nearly related Genera. *The ventrals in the two above mentioned species are indeed fused backwards, but forwards the hymen-like curtain, the anterior wall of the fin-funnel, is totally lacking; furthermore, the anterior dorsal fin is never triangular, as in the true Gobies, but quadrangular, the membrane not continuing from the last dorsal ray backward down to the back; and the anal papilla seems to be lacking, but this last character is uncertain.*"

#### Order SCLEROPAREI.

##### Series *Platycephaliformes*.

The fishes vernacularly known as Flatheads are of much commercial importance in Australia, yet the major divisions into which they are classified have not been clearly defined and much work requires to be done before the various Australian species are satisfactorily known. As a preliminary step towards study, the following notes are offered.

Flatheads are mail-cheeked fishes, that is, they have the posterior projection of the suborbital bones across the cheek to the operculum, and are further distinguished by the depressed head, which is much broader than deep, and the wide gill-slits. The following is a key to the Australian families and subfamilies:

- A. Body naked, with a row of large spiny bucklers along each side ..... Family OPLICHTHYIDÆ.
- AA. Body scaly, without large spiny bucklers on the sides ..... Family PLATYCEPHALIDÆ.
- B. Head moderately depressed, with strong ridges and spines.
- C. Preopercle with a very strong antrorse spine on lower margin ..... Subfamily ROGADIINÆ.
- CC. Preopercle without an antrorse spine.
- D. One enlarged spine on preopercular margin.
- E. Body deep. Fin-rays united by membrane along their length.
- F. Sides of head uncarinate. Infraorbital ridge with close-set serrations. Orbit with cirrhus ..... Subfamily ONIGOCIINÆ.
- FF. Sides of head bicarinate. Infraorbital ridge with spaced serrations. Orbit without cirrhus ..... Subfamily INEGOCIINÆ.
- EE. Body very shallow, elongate. Most of dorsal and anal rays united by membrane connected to their bases ..... Subfamily ELATINÆ, *nov.*
- DD. Several small preopercular spines. Head almost naked. Scales of lateral line enlarged and thickened ..... Subfamily THYSANOPHRYINÆ, *nov.*
- BB. Head greatly depressed, with feeble ridges and spines. Two enlarged spines on preopercular margin. Head largely scaly. No enlarged, thickened scales on lateral line. Vomerine teeth forming a curved band across vomer, not in two separate groups .... Subfamily PLATYCEPHALINÆ.

## Subfamily PLATYCEPHALINÆ.

Genus *Trudis* Whitley, 1931.

*Trudis* Whitley, Austr. Zool., vi, 4, Feb. 13, 1931, p. 327. Orthotype, *Platycephalus bassensis* Cuvier and Valenciennes.

Median occipital ridges absent or rudimentary; no intermediate ridges between lateral occipital and supraorbital ridges.

***Trudis bassensis*** (Cuvier and Valenciennes).

(Plate xxi, figs. 2-3.)

*Platycephalus bassensis* Cuvier and Valenciennes, Hist. Nat. Poiss., iv, Nov., 1829, p. 247. Westernport, Bass Strait (Quoy and Gaimard). Type in Paris Museum.

*Id.* Quoy and Gaimard, Voy. Astrolabe, Zool., iii, 1835, p. 683, pl. x, fig. 3 (D'Entrecasteaux Channel, Tasmania). *Id.* Sauvage, Nouv. Arch. Mus. Hist. Nat. Paris (2), i, 1878, p. 150. Type re-described. *Id.* Waite, Rec. S. Austr. Mus., ii, 1, 1921, p. 173, fig. 282. *Id.* Hughes, Proc. Roy. Soc. Vict. (n.s.), xli, 1, 1928, p. 51 (Trematode parasite; Port Phillip, Victoria).

*Platycephalus tasmanius* Richardson, Trans. Zool. Soc. Lond., iii, June 16, 1842, p. 96, and Zool. Voy., Erebus and Terror, Fish, 1845, p. 23, pl. xviii, figs. 1-2. Port Arthur, Tasmania. Types in British Museum.

*Trudis bassensis* Whitley, Austr. Zool., vi, 1931, p. 327.

The accompanying illustration shows one of three specimens, 8¼ to 9 inches long, from the Derwent River estuary, Tasmania. Austr. Mus. regd. nos. I.12794 to 12796. McCulloch (in MSS.) noted the colours of another specimen (no. E.4950) as "Cinder grey in colour with faint darker bands across the back. Entire head and body closely spotted with small reddish-brown spots, which are larger on the sides. Dorsals, pectorals and upper part of caudal also spotted, the latter with a black blotch on the lower half. Ventrals olive green. Lower parts whitish. Caught on line in about 8 fathoms close to Babel Island, Bass Strait."

*Trudis cæruleopunctatus* (McCulloch).

(Plate xxi, fig. 4.)

*Platycephalus bassensis* Tenison-Woods, Fish. Fisher. N. S. Wales, 1882, p. 67, and of New South Wales records generally. Not *P. bassensis* Cuvier and Valenciennes.

*Platycephalus cæruleopunctatus* McCulloch, Austr. Zool., ii, 3, 1922, p. 120; Austr. Zool. Handbook, i, 1922, p. 94. New name for *P. bassensis* of New South Wales authors, non Cuv. and Val. *Id.* Whitley, Austr. Zool., v, 4, 1929, p. 353.

D.viii/14; A.14; P.20; V.i/5, C.11. L.lat. 85 to root of caudal.

Head (88 mm.) nearly 3.3 in length from tip of snout to hypural joint (290). Eye (15.5) nearly 6.2, interorbital (11.5) 7.6, preorbital (20) 4.4 in length of head. Width of head between bases of preopercular spines 57 mm. Depth of head *circa* 19 mm. Cranial ridges prominent, smooth. A small antorbital spine, but no tentacles. Interorbital concave, its width slightly less than that of each eye. Eye-diameter greater than half its distance from end of mandible. Maxillary reaching to below anterior portion of pupil. Three preorbital spines, the posterior one very small. Bony stay of cheek smooth. Lower preopercular spine less than  $1\frac{1}{2}$  times length of upper. A broad band of villiform teeth in the upper jaw, becoming cardiform near the symphysis. A band of small teeth on the anterior portion of the lower jaw, which changes into a row of enlarged, curved teeth on the sides. Vomer with a patch of teeth, similar to those near the symphysis of the upper jaw, on each side. Palatines with a single series of enlarged teeth, having smaller teeth near their bases anteriorly. Gill-rakers short, pointed, pectinate; 14 on lower limit of first gill-arch.

Form elongate, depressed. Body covered with rather small ctenoid scales which extend over the head to before the eyes. Lateral line scales similar to the others, but each with a broad, rather flattened tube.

Base of second dorsal fin shorter than that of anal. First dorsal originating a little in advance of ventrals. Pectorals little shorter than postorbital portion of head. Ventrals long, equal to head without snout, and reaching beyond the vent. Caudal rounded.

Colour, after long preservation in alcohol, brownish. Some blackish marks on the distal parts of the membranes of the caudal fin, and crossing the ends of the lower caudal rays.

Described from the lectotype of *Platycephalus cæruleopunctatus* McCulloch, a specimen, thirteen inches long, dredged in Port Jackson by J. D. Ogilby. Austr. Mus. regd. no. I.3163. Figured from a similar specimen (no. I.10110) caught at Watson's Bay, near Sydney, by H. Coleman and E. le G. Troughton.

Genus *Longitrudis* Whitley, 1931.

*Longitrudis* Whitley, Austr. Zool., vi, 4, Feb. 13, 1931, p. 327. Orthotype, *Platycephalus longispinis* Macleay.

A short median occipital ridge present; lateral occipital ridges connected with the supraorbital ridges by intermediate ones.

**Longitrudis longispinis** (Macleay).

(Plate xxi, fig. 1.)

*Platycephalus longispinis* Macleay, Proc. Linn. Soc. N. S. Wales, ix, 1, May 23, 1884, p. 170. Outside Port Jackson, N. S. Wales; 50 faths. *Id.* Stead, Fish. Austr., 1906, pp. 197 and 265, and Edib. Fish. N. S. Wales, 1908, p. 112. *Id.* McCulloch, Austr. Zool., ii, 3, 1922, p. 121.

*Longitrudis longispinis* Whitley, Austr. Zool., vi, 4, 1931, p. 327.

Here figured from an example 10 $\frac{3}{4}$  inches in total length, with 38 transverse series of body-scales, from near Sydney, New South Wales. Austr. Mus. regd. no. I.9569. Presented by the State Fisheries Department in 1908.

Genus **Neoplatycephalus** Castelnau, 1872.

*Neoplatycephalus* Castelnau, Proc. Zool. Acclim. Soc. Vict., i, July 15, 1872, p. 87. Haplotype, *N. grandis* Castelnau.

Easily recognized by its long canine teeth.

**Neoplatycephalus macrodon** (Ogilby).

(Plate xxi, figs. 5-6.)

*Platycephalus macrodon* Ogilby, Abstr. Proc. Linn. Soc. N. S. Wales, May 27, 1885, p. iv, *nomen nudum*, and Proc. Linn. Soc. N. S. Wales, x, 2, July 31, 1885, pp. 189 and 226. Port Jackson, N. S. Wales. Type in Austr. Mus. *Id.* Waite and McCulloch, Trans. Roy. Soc. S. Austr., xxxix, 1915, p. 468, pl. xii, fig. 4, as *N. macrodon* (gill-arch).

*Platycephalus* sp., Stead, Edib. Fish. N. S. Wales, 1908, p. 113.

*Platycephalus* (*Neoplatycephalus*) *macrodon* McCulloch, Austr. Zool., ii, 3, 1922, p. 121.

*Neoplatycephalus macrodon* Roughley, Fish. Austr. Tech., 1916, p. 183.

D.viii/14; A.14; P.20; V.i/5; C. 12; L.lat. less than 70 to root of caudal.

Head (95 mm.) 2.9 in length from tip of snout to hypural joint (282). Eye (18) 5.2, interorbital (13) 7.3, preorbital (maximum 22 mm.) 4.3 in length of head. Width of head between bases of preopercular spines 56 mm. Depth of head *circa* 28 mm.

Cranial ridges low, smooth. A small antorbital spine, but no ocular tentacles. Interorbital flat, sunken, its width subequal to that of each eye. Maxillary reaching to below anterior portion of pupil. Two preorbital spines and a tiny projection suggesting a vestigial third; the first spine is twice as long and strong as the second. Bony stay of cheek smooth. Preopercular spines strong, the lower slightly longer than the upper. A band of villiform teeth in the upper jaw with a few canines, the hindmost ones largest, near the symphysis. Lower jaw with a row of canines at each side, with some villiform teeth behind the few canines near the symphysis. Vomer with a curved band of small, pointed teeth. Four or five large canines and a row of villiform teeth on each palatine. 11 or 12 gill-rakers on lower limit of first gill-arch, arranged in pairs and becoming rudimentary anteriorly.

Form elongate, fairly robust. Body covered with moderate, weakly ctenoid scales which extend over the head to the cheeks and upper parts of the snout.

First dorsal fin originating in advance of ventrals. Base of second dorsal slightly shorter than that of anal. Pectorals nearly equal in length to postorbital portion of head. Ventrals equal to distance from first dorsal spine to first dorsal ray. Caudal subtruncate.

Colour, after long preservation in alcohol, brown with a dark mark on each operculum and the end of the caudal fuscous.

Described and figured from the holotype of *Platycephalus macrodon* Ogilby, a specimen a little over thirteen inches long, dredged by Mr. J. D. Ogilby in Port Jackson over forty years ago. Austr. Mus. regd. no. B.6541.

This species grows to a length of over twenty-one inches and is forming the subject of detailed investigations as to growth-rate, age, etc., by members of the Department of Zoology, University of Sydney.

#### EXPLANATIONS OF PLATES.

##### PLATE XX.

Fig. 1.—*Isuropsis* sp. Lateral view of an immature female specimen from South Africa.

Fig. 2.—*Isuropsis* sp. Ventral view of the same specimen.

Fig. 3.—*Notorynchus macdonaldi* Whitley. Female holotype from Manly, New South Wales.

Fig. 4.—*Notorynchus macdonaldi* Whitley. Snout and jaws of the same specimen.

Fig. 5.—*Notorynchus macdonaldi* Whitley. Dorsal view of head and anterior part of body to show colour-markings.

##### PLATE XXI.

Fig. 1.—*Longitrudis longispinis* (Macleay). A specimen from near Sydney, New South Wales.

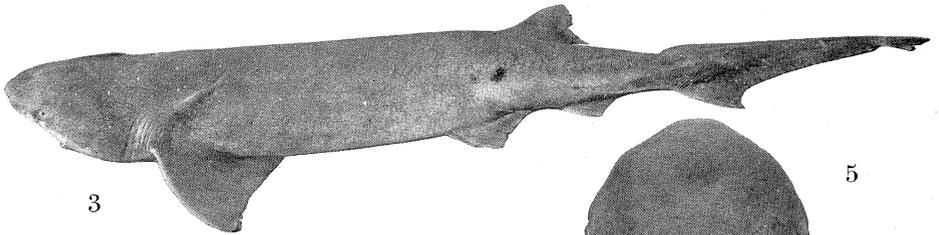
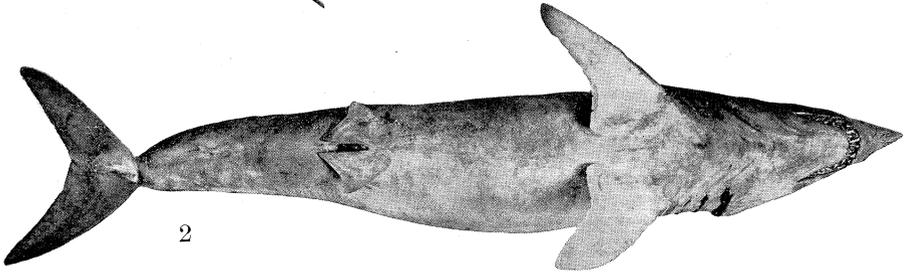
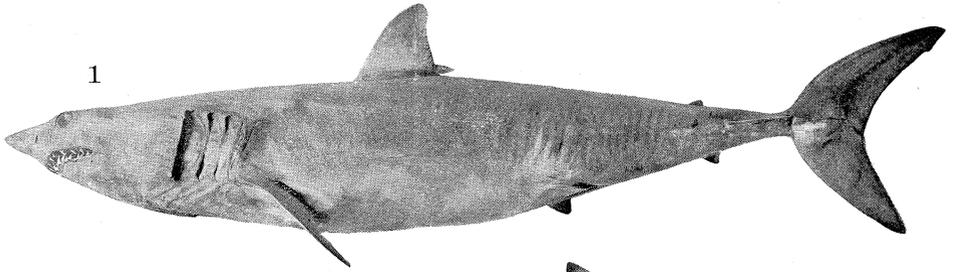
Fig. 2.—*Trudis bassensis* (Cuvier and Valenciennes). A specimen from the Derwent River estuary, Tasmania.

Fig. 3.—*Trudis bassensis* (Cuvier and Valenciennes). Dorsal view of head of same specimen.

Fig. 4.—*Trudis cæruleopunctatus* (McCulloch). A specimen from Watson's Bay, near Sydney, New South Wales.

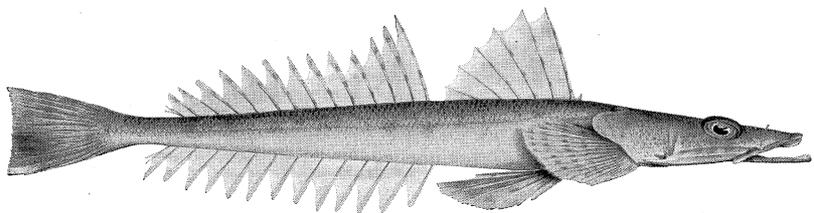
Fig. 5.—*Neoplatycephalus macrodon* (Ogilby). Lateral view of holotype from Port Jackson, New South Wales.

Fig. 6.—*Neoplatycephalus macrodon* (Ogilby). Dorsal view of holotype.

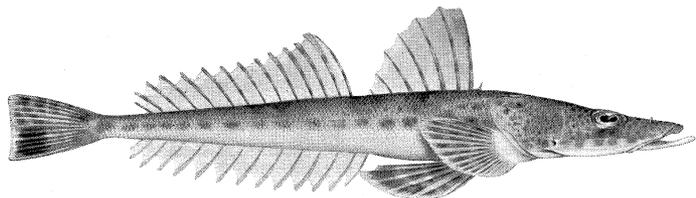


G. C. CLUTTON, photo.

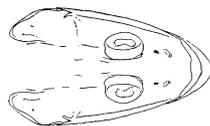




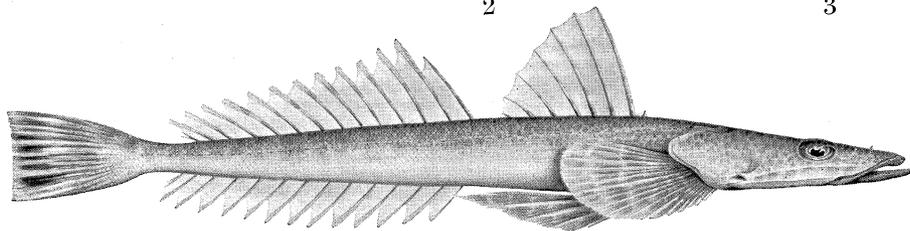
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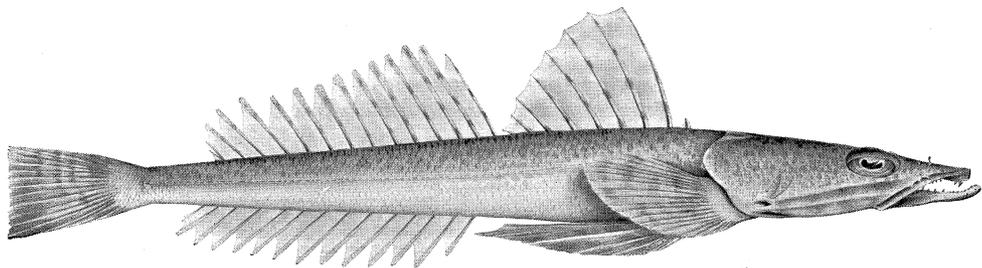
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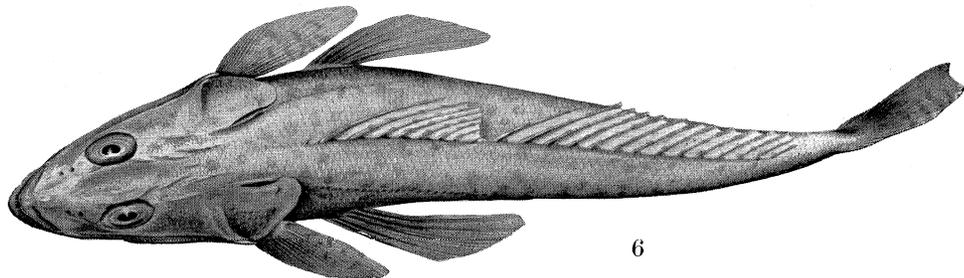
3



4



5



6

PHYLLIS CLARKE (1, 4 and 5), ALLAN R. McCULLOCH (2 and 3),  
and DENE B. FRY (6), del.