

## V. PISCES.

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(Plates XI.-XVIII.)

LEAVING out a few Fishes obtained on the way to the Antarctic region and about New Zealand and Tasmania, as well as a number of others, the decomposed condition of which precluded any attempt at identification, the collection on which this report is based consisted of about 200 specimens, referable to sixteen species, eight of which are new, two belonging to undescribed genera.

### CHONDROPTERYGII.

#### SPINACIDAE.

##### 1. EUPROTOMICRUS LABORDII, Q. et G.

A single female specimen from Campbell Island, south of New Zealand. First discovered by Quoy and Gaimard near Mauritius, this very rare little Selachian has since been reported from the Antarctic Ocean, west of Cape Horn (R. O. Cunningham, Proc. Zool. Soc., 1899, p. 732).

### TELEOSTEI.

#### SCOPELIDAE.

##### 2. SCOPELUS ANTARCTICUS, Gthr.

A single specimen was obtained on an ice-floe in Robertson Bay.

#### NOTOTHENIIDAE.

Not long ago,<sup>1</sup> whilst examining the skeletons of the "Trachinoid" Fishes with a view to a more natural arrangement of this

<sup>1</sup> Ann. and Mag. N. H. (7) viii., 1901, p. 261.



artificial group, I came to the conclusion that a valuable character existed in the position of the fenestra at the base of the pectoral fin, situated either in the scapula or between the latter and the coracoid. Although I had myself pointed out the variable position of this fenestra within the limits of a natural family, the *Mormyridae*,<sup>1</sup> I felt justified in assigning to it the importance of a family character in the higher group Acanthopterygians, the more so as various authors<sup>2</sup> had even regarded it as worthy of defining Sub-orders or Orders. In this, however, I was mistaken; and, after having reduced its importance to that of a family character, I must now abandon its use for anything higher than generic definition.

This result is brought about by the study of the 'Southern Cross' collection. The genus *Notothenia*, the type of the family *Nototheniidae*, is possessed of a pectoral arch similar to that of the *Trachinidae*, *Callionymidae*, and *Gadidae*, i.e. with the scapular fenestra between the scapular and coracoid bones, as I have ascertained on the type species of the genus, *N. coriiceps*, Richards., as well as on all the other species represented in the British Museum. But now, on examining the condition of things in some of the new fishes discovered in Robertson Bay, which, so far as external characters are concerned, do not differ materially from *Notothenia*, I find, to my great surprise, that the fenestra is situated in the scapula, as in the *Leptoscopidae*. It is perfectly clear, therefore, that the value of the character in question has been over-rated, and its claim to anything higher than generic importance is out of the question. Even this might be contested by some systematists, but the facility with which the point may be ascertained, without injury to the specimen, by lifting up the skin and muscles at the base of the pectoral fin, should encourage the use of a character which is after all of importance and may still help in defining family groups other than the very generalised *Nototheniidae*. These differ from the *Trachinidae*, *Percophiidae*, *Parapercididae*, *Leptoscopidae*, and *Uranoscopidae* in having a single nostril instead of the two possessed by most Teleosts. I have attempted, in the following synopsis, to enumerate and define the genera grouped under the *Nototheniidae*. The pectoral arch has not been examined in the genera marked with an asterisk; otherwise all except *Trematomus* conform to the type to which *Notothenia* belongs.

The air-bladder is constantly absent, and every form examined

<sup>1</sup> Poiss. du Bassin du Congo, p. 50 (1901).

<sup>2</sup> Cope, Trans. Amer. Philos. Soc. (2), xiv., 1871, p. 458. Gill, Proc. Acad. Philad., 1884, p. 170. Jordan and Evermann, Fish. N. Amer., iii., p. 2528 (1898).



by me, including *Bathhydraco*, has pseudobranchiae. The ventral fins are never close together, as in the *Trachinidae* and *Uranoscopidae*.

I. Gill-membranes free or narrowly attached to the isthmus.

A. Dorsal formed of two portions, which may be united at the base.

1. Two lateral lines, the lower of which may be confined to the caudal region; palate toothless.

a. Body covered with ctenoid scales; teeth in several series; snout not spatulate.

α. Anterior dorsal formed of slender, flexible rays.

Scapular foramen in scapular bone..... *Trematomus*, g. n.

Scapular foramen between scapula and coracoid ..... *Notothenia*, Rich.

β. Anterior dorsal formed of short, pungent spines .....

*Macronotothen*, Gill.\*

b. Body covered with very small cycloid scales; teeth in a single series; snout not spatulate.....

*Dissostichus*, Smitt.\*

c. Body naked; snout spatulate.

Lateral line with granulated plates ..... *Chaenichthys*, Rich.

Lateral line without plates ..... *Champscephalus*, Gill.

2. Three lateral lines; body naked; snout spatulate; palate toothless .....

*Cryodraco*, Dollo.\*

3. A single lateral line.

a. Body scaly.

Teeth on vomer and palatines; head armed..... *Centropercis*, Ogilby.\*

Teeth on vomer and palatines; opercle with a flat spine... *Pseudaphritis*, Casteln.

Teeth on vomer only; a praeorbital spine..... *Acanthaphritis*, Gthr.

Palate toothless..... *Eleginops*, Gill.

b. Body naked; habit cottoid; opercle

strongly armed..... *Bovichthys*, C. & V.

B. A single dorsal; snout long and flattened; palate toothless.

1. Two lateral lines.

a. Body naked; opercle armed.

Lateral lines without bony plates ..... *Gymnodraco*, g. n.

Lateral lines with bony plates ..... *Parachaenichthys*, g. n.\*<sup>1</sup>

b. Body covered with extremely small scales; no opercular spines.....

*Gerlachia*, Dollo.\*

2. Lateral line single; body covered with extremely small scales.

No opercular spines..... *Bathhydraco*, Gthr.

Opercular spines ..... *Racovitzaia*, Dollo.\*<sup>2</sup>

II. Gill-membranes broadly united to the isthmus; habit

cottoid; body naked; head armed; palate toothless *Harpagifer*, Rich.

The genus *Pagetodus*, Rich., rests on an insufficient description and figure.

<sup>1</sup> Based on *Chaenichthys georgianus*, Fischer, from South Georgia Island.

<sup>2</sup> The distinctive characters of these genera have unfortunately been inverted in the synopsis given in Ann. and Mag. N. H. (7) viii. 1901, p. 266.



**TREMATOMUS**, gen. n.

Differing from *Notothenia* in the scapular fenestra being pierced in the scapula instead of between the latter and the coracoid.

*Synopsis of the Species.*

- I. Interorbital width 3 to  $3\frac{1}{2}$  times in length of head; lower jaw projecting beyond upper; gill-rakers 18 to 20 on lower part of anterior arch.  
 D. VI-VIII, 32-36; A. 32-33; Sq. 90-100  $\frac{7-8}{30-31}$ ; lateral lines strongly marked, tubular..... 1. *newnesi*, sp. n.  
 D. V-VI, 34-37; A. 31-33; Sq. 97-110; lateral lines ill-defined..... 2. *borchgreivinki*, sp. n.
- II. Interorbital width  $4\frac{1}{3}$  to  $5\frac{1}{2}$  times in length of head; lower jaw not projecting beyond upper; gill-rakers 12 to 15 on lower part of anterior arch.  
 D. V-VII (usually VI), 38-41; A. 34-35; Sq. 65-75  $\frac{5-6}{20-24}$ ; interorbital region scaly..... 3. *hansoni*, sp. n.  
 D. IV-VI (usually V), 35-38; A. 32-35; Sq. 66-80  $\frac{5-6}{20-25}$ ; interorbital region naked or with a few scales..... 4. *bernacchii*, sp. n.

As regards the skeleton, which I have been able to examine in the four species, the characters are essentially the same, except that the ossification is stronger, and the skull more massive, in the species of Group I. than in those of Group II. The parapophyses begin on the second or third vertebræ and soon become very strong; they bear the rib and the epipleural, which are inserted close together. Number of vertebræ:—

<i>T. newnesi</i> .	20 + 34 = 54
<i>T. borchgreivinki</i> .	20 + 32 = 52
<i>T. hansoni</i> .	21 + 35 = 56
<i>T. bernacchii</i> .	17 + 35 = 52

3. **TREMATOMUS NEWNESI**, sp. n.

(PLATE XI.)

Depth of body 4 to  $4\frac{2}{3}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Diameter of eye 3 (young) to 4 times in length of head, interorbital width 3 to  $3\frac{1}{2}$  times; maxillary extending to below centre or posterior third of eye; lower jaw projecting beyond the upper; upper surface of head naked; cheek and opercle densely scaled. Gill-rakers long and slender, 18 to 20 on lower part of anterior arch. Dorsal VI-VIII,<sup>1</sup> 32-36; longest rays  $\frac{2}{3}$  to  $\frac{1}{2}$  length of head. Anal 32-35; longest rays  $\frac{1}{3}$  length of head. Pectoral

<sup>1</sup> Out of 70 specimens, 48 have VII, 19 have VIII, and 3 have VI.



truncate behind, a little shorter than head, reaching beyond origin of anal. Ventral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Caudal rounded. Caudal peduncle as long as deep. Scales 87-100  $\frac{7-8}{28-30}$ ; lateral line  $\frac{41-52}{3-17}$ . Dark olive, uniform or with darker spots or marblings; anterior dorsal blackish, other fins greyish, often with small black spots.

Total length, 190 mm.

Forty-seven specimens found about Duke of York Island, at a depth of 3 to 5 fathoms, and 23 from Cape Adare, 4 to 8 fathoms.

Measurements and numbers of fin-rays and scales of some of the specimens<sup>1</sup>:—

	1	2	3	4	5	6	7	8	9	10	11
Duke of York Island . . .	190	VII	33	33	$4\frac{1}{2}$	$3\frac{3}{5}$	4	$3\frac{1}{2}$	93	$\frac{7}{30}$	$\frac{43}{14}$
" " " . .	190	VIII	32	32	$4\frac{1}{2}$	$3\frac{2}{3}$	$3\frac{3}{4}$	$3\frac{1}{3}$	92	$\frac{8}{30}$	$\frac{46}{13}$
" " " . .	180	VII	36	35	$4\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{3}$	100	$\frac{7}{29}$	$\frac{49}{16}$
" " " . .	180	VIII	34	32	$4\frac{1}{3}$	$3\frac{3}{5}$	$3\frac{3}{4}$	$3\frac{1}{2}$	98	$\frac{8}{29}$	$\frac{45}{6}$
" " " . .	180	VII	34	32	$4\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{1}{3}$	94	$\frac{7}{32}$	$\frac{42}{4}$
" " " . .	170	VII	34	32	4	$3\frac{1}{2}$	$3\frac{2}{3}$	$3\frac{1}{3}$	88	$\frac{8}{30}$	$\frac{43}{16}$
" " " . .	170	VI	36	34	$4\frac{1}{2}$	4	$3\frac{2}{3}$	$3\frac{1}{3}$	95	$\frac{8}{30}$	$\frac{52}{15}$
" " " . .	170	VII	35	32	4	$3\frac{2}{3}$	4	3	90	$\frac{8}{28}$	$\frac{47}{16}$
" " " . .	170	VII	34	33	$4\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{4}$	93	$\frac{7}{29}$	$\frac{46}{16}$
" " " . .	170	VII	34	32	$4\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{1}{2}$	$3\frac{1}{3}$	92	$\frac{7}{30}$	$\frac{44}{3}$
" " " . .	170	VII	34	33	$4\frac{1}{2}$	$3\frac{3}{5}$	$3\frac{1}{2}$	$3\frac{1}{4}$	87	$\frac{7}{28}$	$\frac{41}{13}$
" " " . .	165	VII	36	34	$4\frac{1}{2}$	$3\frac{3}{5}$	$3\frac{1}{2}$	$3\frac{1}{4}$	95	$\frac{7}{29}$	$\frac{47}{17}$
" " " . .	165	VIII	35	32	$4\frac{2}{5}$	$3\frac{3}{5}$	4	$3\frac{1}{2}$	95	$\frac{8}{32}$	$\frac{47}{12}$
" " " . .	155	VIII	34	34	$4\frac{1}{3}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{3}$	90	$\frac{8}{31}$	$\frac{45}{14}$
" " " . .	150	VIII	35	34	$4\frac{1}{2}$	$3\frac{4}{5}$	$3\frac{1}{2}$	$3\frac{1}{4}$	90	$\frac{7}{30}$	$\frac{47}{15}$
" " " . .	140	VII	36	33	$4\frac{2}{3}$	$3\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$	89	$\frac{7}{28}$	$\frac{46}{14}$
" " " . .	135	VII	35	35	$4\frac{2}{3}$	$3\frac{2}{3}$	3	$3\frac{1}{2}$	100	$\frac{8}{28}$	$\frac{47}{15}$
Cape Adare . . . . .	115	VII	35	33	$4\frac{2}{3}$	$3\frac{1}{2}$	3	$3\frac{1}{2}$	98	$\frac{8}{28}$	$\frac{41}{9}$
" " . . . . .	90	VIII	35	33	$4\frac{2}{3}$	$3\frac{1}{2}$	3	$3\frac{1}{2}$	95	$\frac{7}{30}$	$\frac{45}{9}$

<sup>1</sup> This and the following tables read thus:—1. Total length (in millimetres). 2. Rays in anterior dorsal. 3. Rays in second dorsal. 4. Rays in anal. 5. Depth of body in total length. 6. Length of head in total length. 7. Diameter of eye in length of head. 8. Interorbital width in length of head. 9. Scales in a longitudinal series (above upper lateral line). 10. Scales in a transverse series. 11. Tubular scales in the lateral lines.



## 4. TREMATOMUS BORCHGREVINKI, sp. n.

(PLATE XII.)

Depth of body 4 to 5 times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{4}$  times. Diameter of eye 3 (young) to  $4\frac{1}{2}$  times in length of head, interorbital width 3 to  $3\frac{1}{2}$  times; maxillary extending to below anterior border or anterior third of eye; lower jaw projecting beyond the upper; upper surface of head naked; small patches of scales on cheek and on upper part of opercle; openings of sensory canals on head very large. Gill-rakers moderately long, 18 to 20 on lower part of anterior arch. Dorsal V-VI, 34-37; longest rays  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head. Anal 31-33; longest rays  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head. Pectoral somewhat truncate behind,  $\frac{4}{5}$  or  $\frac{5}{6}$  length of head (nearly as long as head in the young). Caudal rounded. Caudal peduncle as long as deep or a little deeper than long. Scales 97-110; lateral line very indistinct, reduced to mere pits, tubular scales entirely absent or very few. Yellowish, with more or less indistinct dusky spots, forming vertical bars on the sides; a spot above the shoulder and another at the base of the pectoral fin; fins whitish, the dorsal usually with rather indistinct dark streaks.

Six specimens measuring up to 275 mm. from Duke of York Island, on the surface among the ice floes, and 6 from Cape Adare, caught near the surface. One of these has been figured in Bernacchi's 'South Polar Regions,' p. 98.

Measurements and numbers of fin-rays and scales:—

	1	2	3	4	5	6	7	8	9
Duke of York Island .	275	V	37	33	$4\frac{1}{4}$	$4\frac{1}{4}$	4	3	98
"    "    "    .	250	VI	35	31	$4\frac{1}{4}$	4	$4\frac{1}{2}$	3	100
"    "    "    .	170	V	35	31	$4\frac{1}{3}$	$3\frac{2}{3}$	$3\frac{3}{4}$	3	100
"    "    "    .	125	V	35	32	$4\frac{1}{5}$	$3\frac{2}{3}$	$3\frac{2}{3}$	$3\frac{1}{3}$	98
"    "    "    .	120	V	36	32	$4\frac{1}{2}$	$3\frac{4}{5}$	$3\frac{4}{5}$	$3\frac{1}{4}$	97
Cape Adare . . . .	225	VI	35	33	$4\frac{1}{5}$	$3\frac{2}{3}$	4	3	104
"    "    . . . .	225	VI	35	32	5	$3\frac{4}{5}$	4	3	105
"    "    . . . .	210	V	35	33	$4\frac{1}{5}$	$3\frac{2}{3}$	4	3	99
"    "    . . . .	190	V	34	31	$4\frac{1}{2}$	$3\frac{4}{5}$	4	3	110
"    "    . . . .	160	V	35	33	$4\frac{2}{3}$	$3\frac{2}{3}$	$3\frac{1}{2}$	$3\frac{1}{2}$	105
"    "    . . . .	120	VI	34	31	4	$3\frac{1}{2}$	3	3	97



## 5. TREMATOMUS HANSONI, sp. n.

(PLATE XIII.)

Depth of body  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Diameter of eye  $3\frac{2}{3}$  to 4 times in length of head, interorbital width  $4\frac{1}{3}$  to 5 times; maxillary extending to below anterior third or centre of eye; lower jaw not projecting beyond the upper; cheek, opercle, occiput, and interorbital region densely scaled; openings of sensory canals on head large. Gill-rakers short, 13 to 15 on lower part of anterior arch. Dorsal V-VII,<sup>1</sup> 38-41; longest rays about  $\frac{1}{2}$  length of head. Anal 34-35; longest rays about  $\frac{1}{3}$  length of head. Pectoral rounded, a little shorter than head, reaching beyond origin of anal. Ventral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Caudal rounded. Caudal peduncle as long as deep. Scales 65-75  $\frac{5-6}{20-24}$ ; upper lateral line 38-44, lower usually formed of a series of pits, or reduced to a few tubular scales. Brownish, lighter beneath, with large dark spots or marblings or more or less regular cross-bands; fins greyish, dorsals, pectorals, and caudal usually with more or less distinct darker bars.

Total length, 280 mm.

Seventeen specimens from Cape Adare, 4 to 8 fathoms, and 1 from Duke of York Island, 3 to 4 fathoms.

Measurements and numbers of fin-rays and scales of some of the specimens:—

	1	2	3	4	5	6	7	8	9	10	11
Cape Adare . . . . .	280	VI	39	34	4	$3\frac{4}{5}$	4	5	70	$\frac{6}{22}$	40
" " . . . . .	270	VI	39	35	$3\frac{1}{2}$	$3\frac{2}{3}$	4	5	75	$\frac{6}{24}$	43
" " . . . . .	265	VI	41	35	$3\frac{2}{3}$	$3\frac{2}{3}$	4	5	67	$\frac{6}{24}$	41
" " . . . . .	250	VII	38	34	$3\frac{4}{5}$	$3\frac{2}{5}$	4	5	65	$\frac{5}{21}$	42
" " . . . . .	250	VI	40	35	$4\frac{1}{4}$	4	4	5	71	$\frac{6}{20}$	39
" " . . . . .	220	VI	40	35	$4\frac{1}{2}$	$3\frac{2}{3}$	4	$4\frac{1}{2}$	73	$\frac{6}{21}$	45
" " . . . . .	210	V	40	35	$4\frac{1}{4}$	$3\frac{4}{5}$	4	5	70	$\frac{5}{22}$	39
" " . . . . .	205	VI	40	35	4	$3\frac{2}{3}$	4	5	65	$\frac{6}{22}$	40
" " . . . . .	205	VI	40	35	4	$3\frac{2}{3}$	$3\frac{3}{4}$	5	65	$\frac{6}{20}$	38
" " . . . . .	195	VI	40	35	$4\frac{1}{2}$	$3\frac{2}{3}$	$3\frac{3}{4}$	5	70	$\frac{6}{20}$	44
" " . . . . .	190	VI	39	35	$4\frac{1}{4}$	$3\frac{2}{3}$	4	5	68	$\frac{5}{21}$	40
" " . . . . .	190	VI	39	35	$4\frac{1}{4}$	4	4	$4\frac{2}{3}$	68	$\frac{5}{20}$	39
" " . . . . .	165	VI	38	35	$4\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{2}{3}$	5	65	$\frac{5}{20}$	42
" " . . . . .	160	VI	39	34	$4\frac{1}{2}$	$3\frac{2}{3}$	$3\frac{2}{3}$	$4\frac{1}{2}$	66	$\frac{6}{20}$	40
Duke of York Island . .	175	VI	39	34	$4\frac{1}{2}$	$3\frac{2}{3}$	$3\frac{3}{4}$	5	70	$\frac{6}{24}$	42

<sup>1</sup> Usually VI; of the 18 specimens examined, only one has five rays, and one seven.



## 6. TREMATOMUS BERNACCHII, sp. n.

(PLATE XIV.)

Depth of body  $3\frac{1}{3}$  to 4 times in total length, length of head  $3\frac{1}{2}$  to 4 times. Diameter of eye  $3\frac{1}{2}$  to 4 times in length of head, interorbital width 5 to  $5\frac{1}{2}$  times; maxillary extending to below anterior third or centre of eye; lower jaw not projecting beyond the upper; cheek, opercle, and occiput densely scaled; interorbital region naked or with a few scales; openings of sensory canals on head large. Gill-rakers short, 13 to 15 on lower part of anterior arch. Dorsal IV-VI,<sup>1</sup> 35-38; longest rays about  $\frac{1}{2}$  length of head. Anal 32-35; longest rays about  $\frac{1}{3}$  length of head. Pectoral rounded,  $\frac{2}{3}$  length of head, reaching origin of anal or a little beyond. Ventral  $\frac{3}{4}$  to  $\frac{5}{6}$  length of head. Caudal rounded. Caudal peduncle deeper than long. Scales 66-80  $\frac{5-6}{20-25}$ ; upper lateral line 31-40, lower usually formed of a series of pits or reduced to a few tubular scales. Brownish, lighter beneath, with large dark spots, usually forming two or three alternating series on the side; fins grey, upper half of anterior dorsal black or blackish.

Total length, 250 mm.

Thirty-nine specimens from Cape Adare, 5 to 8 fathoms, and 5 from Duke of York Island, 3 to 4 fathoms.

Measurements and numbers of fin-rays and scales in some of the specimens:—

	1	2	3	4	5	6	7	8	9	10	11
Cape Adare . . . . .	250	V	36	33	$3\frac{3}{4}$	$3\frac{3}{4}$	4	$5\frac{1}{2}$	72	$\frac{6}{23}$	36
" " . . . . .	230	V	38	33	$3\frac{1}{3}$	$3\frac{3}{4}$	4	$5\frac{1}{2}$	68	$\frac{6}{22}$	36
" " . . . . .	230	V	35	35	$3\frac{2}{5}$	$3\frac{1}{2}$	4	5	75	$\frac{6}{25}$	40
" " . . . . .	220	V	37	34	$3\frac{2}{3}$	$3\frac{1}{2}$	4	$5\frac{1}{2}$	77	$\frac{6}{24}$	37
" " . . . . .	220	V	35	33	$3\frac{2}{3}$	$3\frac{1}{3}$	4	5	75	$\frac{6}{25}$	32
" " . . . . .	220	V	36	33	$3\frac{4}{5}$	$3\frac{2}{3}$	4	5	68	$\frac{6}{22}$	35
" " . . . . .	220	IV	37	35	$3\frac{4}{5}$	$3\frac{1}{2}$	4	$5\frac{1}{2}$	80	$\frac{6}{24}$	37
" " . . . . .	215	V	35	33	$3\frac{1}{2}$	$3\frac{1}{2}$	4	$5\frac{1}{2}$	72	$\frac{6}{23}$	35
" " . . . . .	200	V	38	33	4	$3\frac{2}{5}$	4	5	73	$\frac{6}{21}$	35
" " . . . . .	200	VI	36	33	4	$3\frac{1}{3}$	$3\frac{3}{4}$	5	74	$\frac{6}{20}$	36
" " . . . . .	185	V	35	35	4	$3\frac{2}{5}$	4	$5\frac{1}{2}$	77	$\frac{6}{24}$	31
" " . . . . .	180	IV	37	34	$3\frac{1}{3}$	$3\frac{1}{3}$	4	5	70	$\frac{6}{24}$	35
" " . . . . .	180	V	36	34	$3\frac{2}{3}$	$3\frac{2}{3}$	$3\frac{2}{3}$	$5\frac{1}{2}$	76	$\frac{6}{25}$	35
" " . . . . .	170	V	36	34	4	$3\frac{1}{3}$	$3\frac{3}{4}$	$5\frac{1}{2}$	67	$\frac{6}{21}$	35
" " . . . . .	165	V	38	32	4	$3\frac{2}{5}$	$3\frac{3}{4}$	$5\frac{1}{2}$	77	$\frac{6}{20}$	35
Duke of York Island . . .	230	V	37	32	4	$3\frac{2}{3}$	$3\frac{4}{5}$	5	70	$\frac{6}{21}$	34
" " " . . . .	185	V	35	33	4	$3\frac{1}{3}$	$3\frac{3}{4}$	$5\frac{1}{2}$	68	$\frac{6}{20}$	31
" " " . . . .	180	V	38	32	$3\frac{4}{5}$	$3\frac{1}{2}$	$3\frac{3}{4}$	$5\frac{1}{2}$	75	$\frac{6}{23}$	35
" " " . . . .	170	V	38	35	4	$3\frac{2}{3}$	$3\frac{3}{4}$	$5\frac{1}{2}$	66	$\frac{6}{20}$	33
" " " . . . .	120	V	35	32	4	$3\frac{1}{2}$	$3\frac{1}{2}$	$5\frac{1}{2}$	79	$\frac{6}{22}$	35

<sup>1</sup> Usually V.



**NOTOTHENIA**, Richardson.

The identification of the fishes of this Peri-Antarctic genus is beset with great difficulties, in the absence of a general account of them, and this deficiency has resulted in the description of a good number of purely nominal species. An attempt to reduce the number of species described from the Fuegian district has recently been made by Professor Smitt,<sup>1</sup> but a careful examination of the large material in the British Museum has failed to convince me of the soundness of his conclusions. In no species do I find the number of rays in the anterior dorsal varying as much as from 4 to 7, as Professor Smitt believes, nor does the size of the eye prove to be an unreliable character, provided the comparison be made of similar-sized specimens; and the width of the interorbital region, compared to the length of the head, is still more important as not varying with age. Autopsy of a number of individuals among the material at hand has satisfied me that sexual dimorphism does not account for the differences in the proportions of the parts of the head which has been ascribed to it. In his endeavour to settle questions of species by means of elaborate tables of measurements, the Professor appears to have lost sight of many really important specific characters, and I consider his contribution as a misleading guide to the study of this difficult group. My conclusions are embodied in the following synopsis of the species, concerning which I wish to point out that I have myself counted, with the greatest care, the fin-rays and scales in nearly all the specimens at my command. Except for the definition of *N. canina* and *N. filholi*, which are only known to me from the descriptions, all the characters are taken from specimens in the British Museum.

The length of the head is measured to the extremity of the opercular bone. The scales in a longitudinal series are counted above the lateral line, from the origin of the latter to the end of the muscular part of the tail; those in the transverse series are counted from the middle of the anterior dorsal to the lateral line, and from the latter to the mid-ventral line, some distance in front of the vent. The lateral line, in these fishes, consists partly of tubules and partly of more or less distinct impressions or pits; only the tubular scales are counted. For the purpose of uniformity, the scales have been almost invariably counted on the left side of the specimens.

<sup>1</sup> Bih. Vet. Ak. Handl., xxiii., iv., 1897, No. 3.



*Synopsis of the Species.*

## I. Anal with 28 to 35 rays.

A. Interorbital width  $3\frac{2}{3}$  to 6 times in length of head.

## 1. Six or seven rays to anterior dorsal; interorbital region and occiput scaly.

D. 33-34; A. 31-33; Sq. 75-86  $\frac{6-7}{20-23}$ ; ventral fin  $\frac{3}{5}$  length of head..... 1. *tessellata*, Rich.<sup>1</sup>

D. 32-33; A. 30-31; Sq. 68-71  $\frac{5-6}{18-19}$ ; ventral fin  $\frac{3}{5}$  length of head; very strong canine teeth ..... 2. *canina*, Smitt.

D. 28-30; A. 28-30; Sq. 50-52  $\frac{4}{14-16}$ ; ventral fin  $\frac{3}{4}$  length of head..... 3. *sima*, Rich.<sup>2</sup>

## 2. Five or six rays to the anterior dorsal; interorbital region and occiput naked.

D. 32-38; A. 28-31; Sq. 67-90  $\frac{7-10}{20-28}$ ; cheek entirely or partially naked ..... 4. *coriiceps*, Rich.<sup>3</sup>

D. 36; A. 33; Sq. 87  $\frac{8}{28}$ ; cheek densely scaled..... 5. *cyaneobranchia*, Rich.

## B. Interorbital width 7 to 8 times in length of head.

1. Sq. 48-54  $\frac{3-5}{13-14}$ ; A. 28-31.

D. VI-VII, 29; ventral  $\frac{2}{3}$  length of head; interorbital region scaly..... 6. *marionensis*, Gthr.<sup>4</sup>

D. VI, 33-35; ventral nearly as long as head; interorbital region naked ..... 7. *elegans*, Gthr.

2. Sq. 66-77  $\frac{5-8}{23-24}$ ; A. 31-33.

D. V-VI, 35-37; ventral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head; interorbital region scaly..... 8. *longipes*, Stdr.<sup>5</sup>

D. IV, 37; ventral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head; interorbital region naked ..... 9. *nicolai*, sp. n.

## C. Interorbital width 10 to 11 times in length of head; interorbital region scaly.

D. IV-V, 35-37; A. 33-35; Sq. 59-66  $\frac{5}{16-17}$ ; ventral as long as or a little shorter than head..... 10. *mizops*, Gthr.

D. VI, 30; A. 32; Sq. 68  $\frac{7}{22}$ ; ventral  $\frac{3}{4}$  length of head..... 11. *acuta*, Gthr.

## II. Anal with 23 to 25 rays.

A. Interorbital width 3 to  $3\frac{1}{2}$  times in length of head.

D. VII-VIII, 26-27; Sq. 100-112  $\frac{12-13}{32-37}$ ; gill-rakers 15 or 16 on lower part of anterior arch; caudal emarginate..... 12. *colbecki*, sp. n.

<sup>1</sup> *N. veitchii*, Gthr., 1874.

<sup>2</sup> *N. squamiceps*, Pters. 1876. *N. cornucola*, f. *squamifrons*, Smitt, 1897.

<sup>3</sup> *N. purpuriceps*, Rich., 1844. *N. cornucola*, Rich., 1844. *N. virgata*, Rich., 1845. *N. marginata*, Rich., 1845. *N. cornucola*, ff. *calva* et *intermedia*, Smitt, 1897. *N. modesta*, Stdr., 1898.

<sup>4</sup> *N. angustifrons*, Fischer, 1885.

<sup>5</sup> *N. squamifrons*, Gthr., 1880. *N. tessellata*, f. *megalops*, Smitt, 1897.



D. VI, 28-29; Sq. 65-68  $\frac{8-9}{23-25}$ ; gill-rakers 10 to 12; caudal rounded ..... 13. *microlepidota*, Hutt.<sup>1</sup>

B. Interorbital width  $2\frac{1}{3}$  to  $2\frac{1}{2}$  in length of head.

D. IV, 29-30; Sq. 58-62  $\frac{7-8}{21-24}$ ; gill-rakers 10 or 11; caudal truncate or slightly emarginate ..... 14. *macrocephala*, Gthr.<sup>2</sup>

III. Anal with 18 to 20 rays.

D. VII, 24-25; Sq. 100-110; head scaly above ..... 15. *filholi*, Sauv.

*Notothenia phocae*, Rich., and *N. magellanica*, Forst., have not been identified.

## 7. NOTOTHENIA NICOLAI, sp. n.

(PLATE XV.)

Depth of body nearly 4 times in total length, length of head  $3\frac{1}{3}$  to  $3\frac{1}{2}$  times. Diameter of eye 3 times in length of head, interorbital width 7 to 8 times; maxillary extending to below anterior fourth or anterior third of eye; lower jaw projecting beyond the upper; upper surface of head naked; cheek and opercle densely scaled. Gill-rakers rather short, 11 or 12 on lower part of anterior arch. Dorsal IV, 35-37; longest rays  $\frac{1}{2}$  length of head. Anal 31-33; longest rays  $\frac{1}{3}$  length of head, Pectoral rounded, a little shorter than head, reaching beyond origin of anal. Ventral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Caudal rounded. Caudal peduncle nearly as long as deep. Scales 69-77  $\frac{7-8}{23-24}$ ; lateral line  $\frac{39-43}{8-18}$ . Olive-brown, with more or less distinct cross-bars, and with or without small black spots; fins dark brown, anterior dorsal black.

Total length, 230 mm.

This new species, named in memory of Nicolai Hanson, is represented by four specimens from Cape Adare, at a depth of 5 to 8 fathoms, and one from Duke of York Island, 4 fathoms. Measurements and numbers of fin-rays and scales in these specimens are here given.

	1	2	3	4	5	6	7	8	9	10	11
Cape Adare . . . . .	230	IV	37	33	4	$3\frac{1}{2}$	3	7	70	$\frac{7}{24}$	$\frac{39}{18}$
" " . . . . .	190	IV	35	32	4	$3\frac{1}{3}$	3	$7\frac{1}{2}$	76	$\frac{7}{24}$	$\frac{40}{15}$
" " . . . . .	160	IV	37	32	4	$3\frac{1}{2}$	3	7	69	$\frac{7}{23}$	$\frac{42}{15}$
" " . . . . .	145	IV	37	32	4	$3\frac{1}{2}$	3	7	70	$\frac{7}{23}$	$\frac{43}{12}$
Duke of York Island . .	160	IV	37	31	4	$3\frac{1}{2}$	3	8	77	$\frac{8}{23}$	$\frac{41}{8}$

<sup>1</sup> *N. parva*, Hutt., 1879.

<sup>2</sup> *N. maoriensis*, Haast, 1873. *N. angustata*, Hutt., 1875. *N. hassleriana*, Stdr., 1875. *N. antarctica*, Ptrs., 1876. *N. arguta*, Hutt., 1879. *N. marmorata*, Fischer, 1885.



## 8. NOTOTHENIA CORIICEPS, Rich.

Robertson Bay, 5 to 7 fathoms.

## 9. NOTOTHENIA COLBECKI, sp. n.

(PLATE XVI.)

Depth of body 4 to 5 times in total length, length of head  $3\frac{1}{3}$  to  $3\frac{3}{5}$  times. Diameter of eye 4 (young) to 6 times in length of head, interorbital width 3 to  $3\frac{1}{2}$  times; maxillary extending to below anterior third or centre of eye; lower jaw projecting beyond the upper; head smooth or papillose, granulate, only the upper part of the cheek and opercle being scaly. Gill-rakers rather short, 15 or 16 on lower part of anterior arch. Dorsal VII–VIII, 26–27; longest rays about  $\frac{2}{5}$  length of head. Anal 23–24; longest rays about  $\frac{1}{3}$  length of head. Pectoral rounded,  $\frac{3}{5}$  length of head, not reaching beyond origin of anal. Ventral about  $\frac{1}{2}$  length of head. Caudal emarginate. Caudal peduncle longer than deep. Dark olive above, yellowish beneath; fins dark brown, dorsal, anal and caudal tipped with yellowish.

Total length, 380 mm.

Twelve specimens from Campbell Island, south of New Zealand.

Measurements and number of rays and scales of some of the specimens:—

	1	2	3	4	5	6	7	8	9	10	11
Campbell Island . . .	380	VII	27	23	4	$3\frac{3}{5}$	6	3	106	$\frac{12}{37}$	$\frac{59}{32}$
„ „ . . .	230	VII	27	23	$4\frac{2}{3}$	$3\frac{1}{2}$	5	3	100	$\frac{12}{34}$	$\frac{70}{32}$
„ „ . . .	130	VIII	27	23	$4\frac{1}{2}$	$3\frac{1}{2}$	5	3	112	$\frac{13}{32}$	$\frac{65}{26}$
„ „ . . .	120	VII	26	24	$4\frac{1}{2}$	$3\frac{1}{3}$	$4\frac{2}{3}$	$3\frac{1}{2}$	105	$\frac{12}{32}$	$\frac{71}{31}$
„ „ . . .	85	VII	26	24	5	$3\frac{1}{3}$	4	$3\frac{1}{2}$	112	$\frac{12}{35}$	$\frac{64}{30}$

## 10. NOTOTHENIA MICROLEPIDOTA, Hutton.

Auckland and Campbell Islands. This species grows to a length of 400 mm., and the very massive adults have quite a cottoid physiognomy.



## 11. NOTOTHENIA MACROCEPHALA, Gthr.

Campbell Island.

**BOVICHTHYS**, Cuv. et Val.

## 12. BOVICHTHYS VARIEGATUS, Rich.

Several specimens from Campbell Island.

**GYMNODRACO**, gen. n.

Body elongate, depressed in front, compressed behind, naked; two lateral lines. Snout flattened, much produced; mouth large, jaws with a single series of closely-set, curved compressed teeth, and with very large canines anteriorly, those of the mandible exposed in front of the snout; palate toothless. Gill-cover with two spines, the upper very strong and with a hooked branch. Gill-membrane narrowly attached to isthmus; branchiostegal rays 6. A single, long dorsal fin, formed of articulated rays; a similar anal fin.

Scapular fenestra between the scapula and the coracoid. Vertebrae 20 + 28; ribs and epipleurals very slender, inserted behind well-developed parapophyses on the praesacral vertebrae.

## 13. GYMNODRACO ACUTICEPS, sp. n.

(PLATE XVII.)

Depth of body 8 to 9 times in total length, length of head 3 to  $3\frac{1}{4}$ . Head strongly depressed, twice as long as broad; snout acutely pointed, as long as postocular part of head; nostril rather large, not tubular, nearer the eye than the end of the snout; interorbital region broad and slightly concave; diameter of eye 5 times in length of head, equal to interorbital width; maxillary extending to below anterior border of eye; lower jaw strongly projecting beyond the snout, which is overlapped by the very strong backwardly directed canine teeth with which the symphysis is furnished; the anterior canine teeth of the praemaxillaries directed forward, the posterior stronger and directed backward; opercle armed with a very strong, flat spine, with an upper hooked branch as in *Harpagifer*; subopercle with a small spine. Dorsal 28-30, originating a little in advance of



the vent, its length nearly twice its distance from the head; longest rays  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head. Anal 24–26, originating below sixth or seventh ray of dorsal; rays nearly as long as dorsals. Pectoral rounded, subtruncate behind,  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head, not reaching vent. Ventral a little shorter than pectoral. Caudal truncate. Caudal peduncle  $1\frac{1}{4}$  to  $1\frac{2}{3}$  as long as deep. Lateral lines appearing as tubes or pits in a series of small scales embedded in the skin; the upper extends from the gill-opening to about the vertical of the origin of the dorsal, the lower from below the extremity of the upper to the root of the caudal fin, running along the middle of the caudal region. Brownish olive, belly whitish; more or less distinct irregular dark brown spots on the head, back, and sides of the caudal region; fins greyish.

Total length, 300 mm.

Five specimens were obtained at Cape Adare, in 4 to 8 fathoms, in April and November, 1899.

This curious fish has been noticed by Bernacchi, 'To the South Polar Regions,' p. 209, and a photograph of it is given in Borchgrevink's book, p. 113, middle figure.

## LEPTOSCOPIDÆ.

### PLEURAGRAMMA, gen. n.

Body rather elongate, compressed, covered with large, thin, cycloid scales; lateral line absent. Snout flattened, but not spatulate; mouth large, with bands of villiform teeth; a pair of canines at the premaxillary symphysis; lateral mandibular teeth in a single series, unequal in size; palate toothless. Opercle ending in a point; no spines on the head. Gill-membrane free; pseudobranchiae present; branchiostegal rays six. Two distinct dorsal fins, the first short and formed of slender simple rays, the second, as well as the anal, long. Skeleton feebly ossified; suborbital chain very slender; scapular fenestra in the scapula; vertebrae 19 + 34, praecaudals without parapophyses.

#### 14. PLEURAGRAMMA ANTARCTICUM, sp. n.

(PLATE XVIII.)

Depth of body about 5 times in total length, length of head  $3\frac{1}{2}$  times. Snout flattened above, with feeble bony ridges, nearly as long as the eye, the diameter of which is contained 3 or  $3\frac{1}{4}$  times in length



of head ; interorbital region flat, with a feeble median ridge, its width  $4\frac{1}{2}$  times in length of head ; maxillary extending to below anterior third or centre of eye ; lower jaw projecting beyond the lower, with a symphysial knob ; upper surface of head naked ; large thin scales on opercle. Gill-rakers long and slender, 23 to 25 on lower part of anterior arch. Dorsal VI, 37-40 ; the anterior rays of the first division longer than those of the second. Anal 30-34. Pectoral scarcely longer than ventral, about  $\frac{3}{5}$  length of head. Caudal emarginate. Scales 45 or 46 in a longitudinal series, 12 in a transverse series. Silvery, brownish on the back, speckled with blackish.

Total length, 165 mm.

This description is based on several specimens, in very bad state of preservation and falling to pieces, obtained on the ice barrier at  $78^{\circ}35'$  S. lat., the farthest point at which fishes have yet been obtained in the Antarctic region. Owing to the condition of the specimens, the figure here given of the entire fish must be regarded as, to some extent, a restoration, which I believe, however, to be correct.

#### BLENNIIDAE.

##### 15. *TRIPTERYGIUM VARIUM*, Bl. Schn.

Auckland Island, 5 fathoms.

#### PLEURONECTIDAE.

##### 16. *RHOMBOSOLEA TAPIRINA*, Gthr.

Campbell Island.

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EXPLANATION OF PLATES.

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PLATE XI.

*Trematomus newnesi* (p. 177), with upper view of head and side view of skull.

PLATE XII.

*Trematomus borchgrevinki* (p. 179), with upper view of head and side view of skull.

PLATE XIII.

*Trematomus hansonii* (p. 180), with upper view of head and side view of skull.

PLATE XIV.

*Trematomus bernacchii* (p. 181), with upper view of head and side view of skull.

PLATE XV.

*Notothenia nicolai* (p. 184), with upper view of head.

PLATE XVI.

*Notothenia colbecki* (p. 185), adult, reduced to  $\frac{1}{3}$  with upper view of head, and young, natural size.

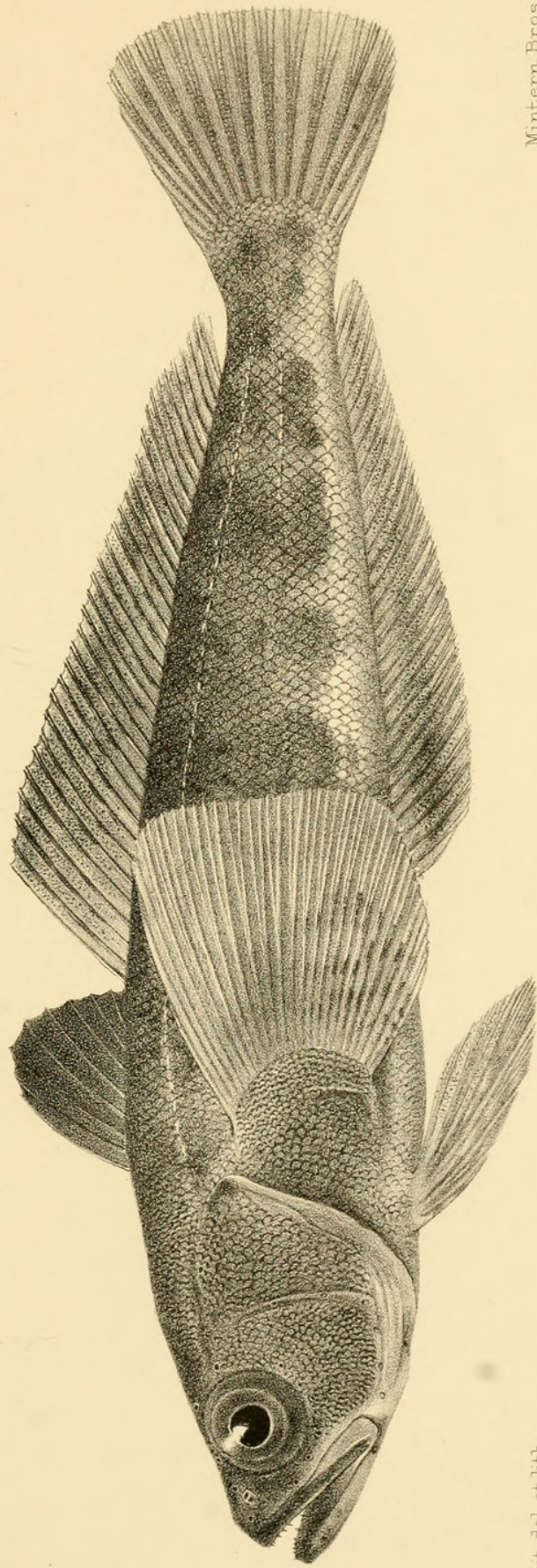
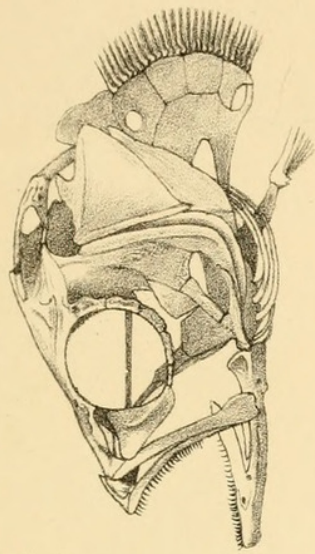
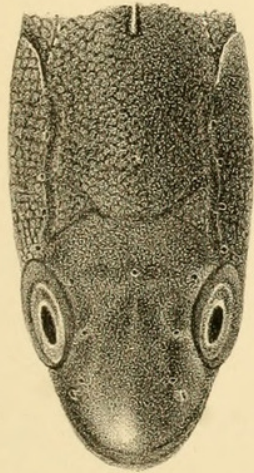
PLATE XVII.

*Gymnodraco acuticeps* (p. 186).

PLATE XVIII.

*Pleuragramma antarcticum* (p. 187).



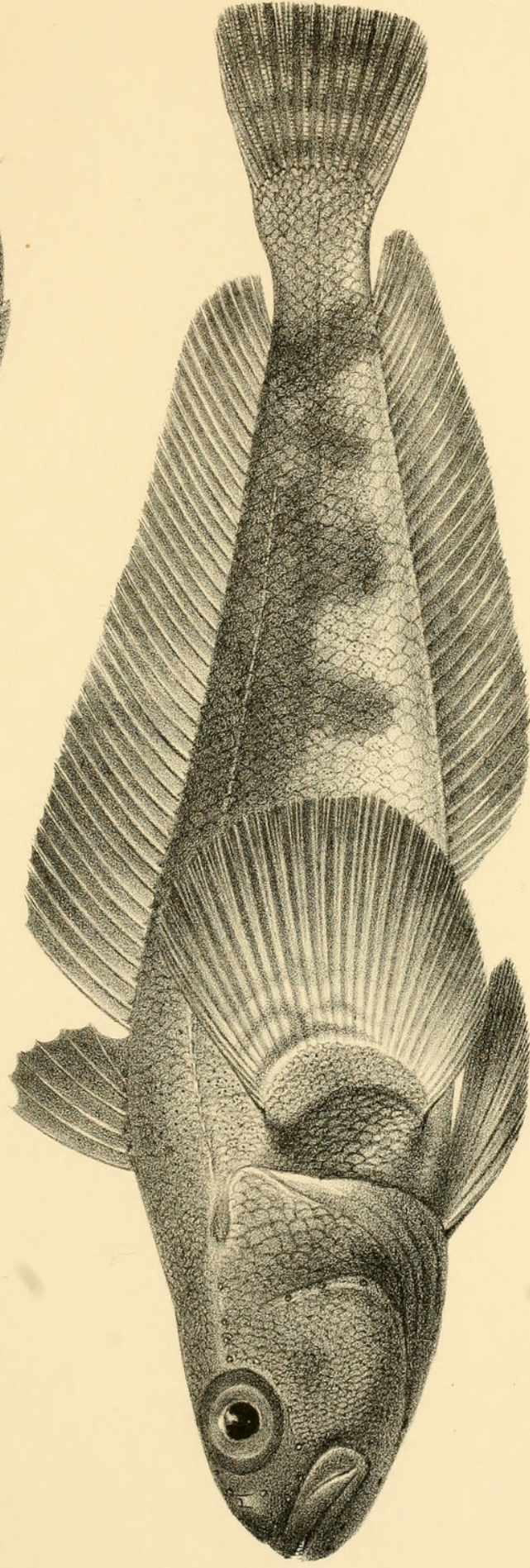
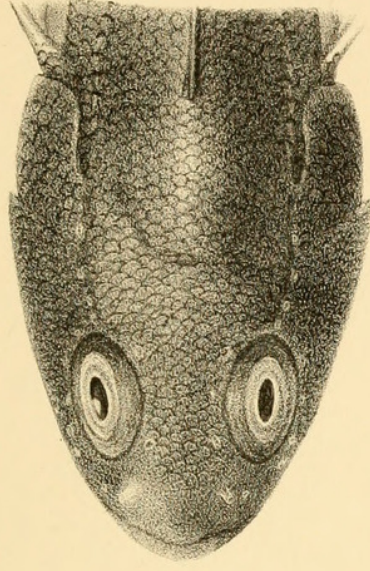
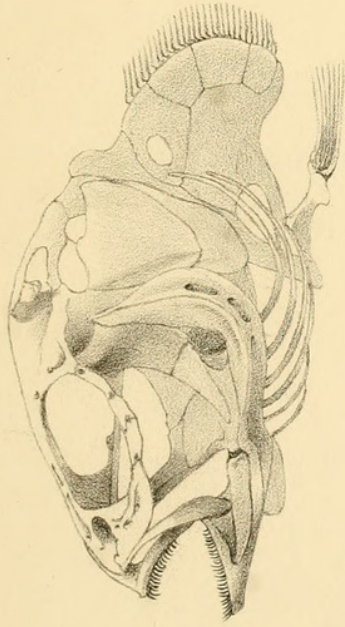


P.J. Smit del. et lith.

TREMATOMUS NEWNESI.

Mintern Bros imp



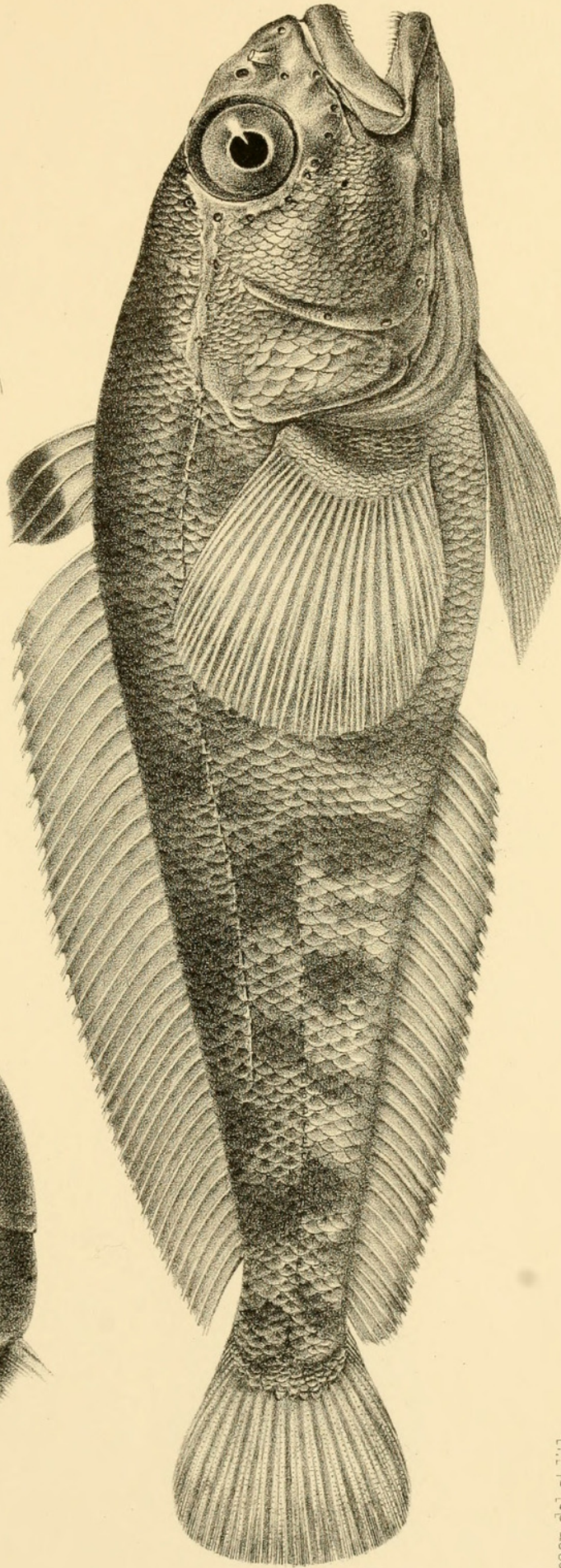
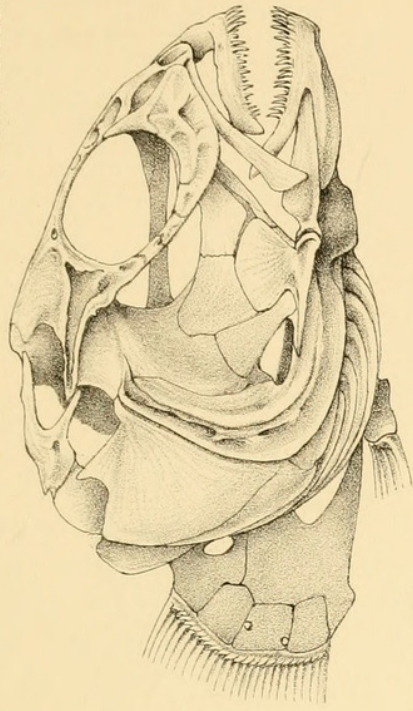
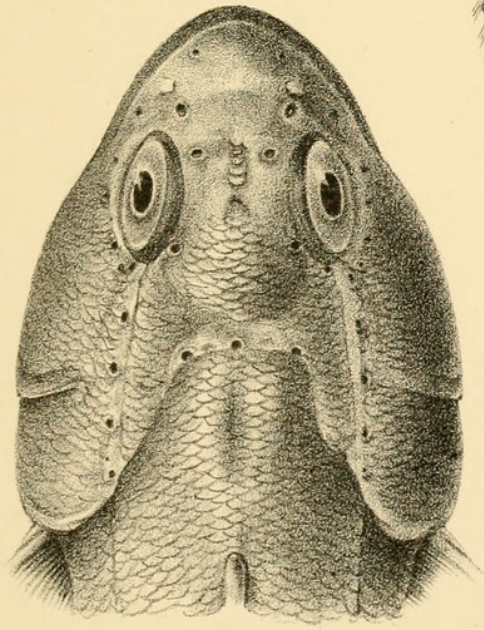


P. J. Smit del et lith.

TREMATOMUS HANSONI.

Mintern Bros imp.



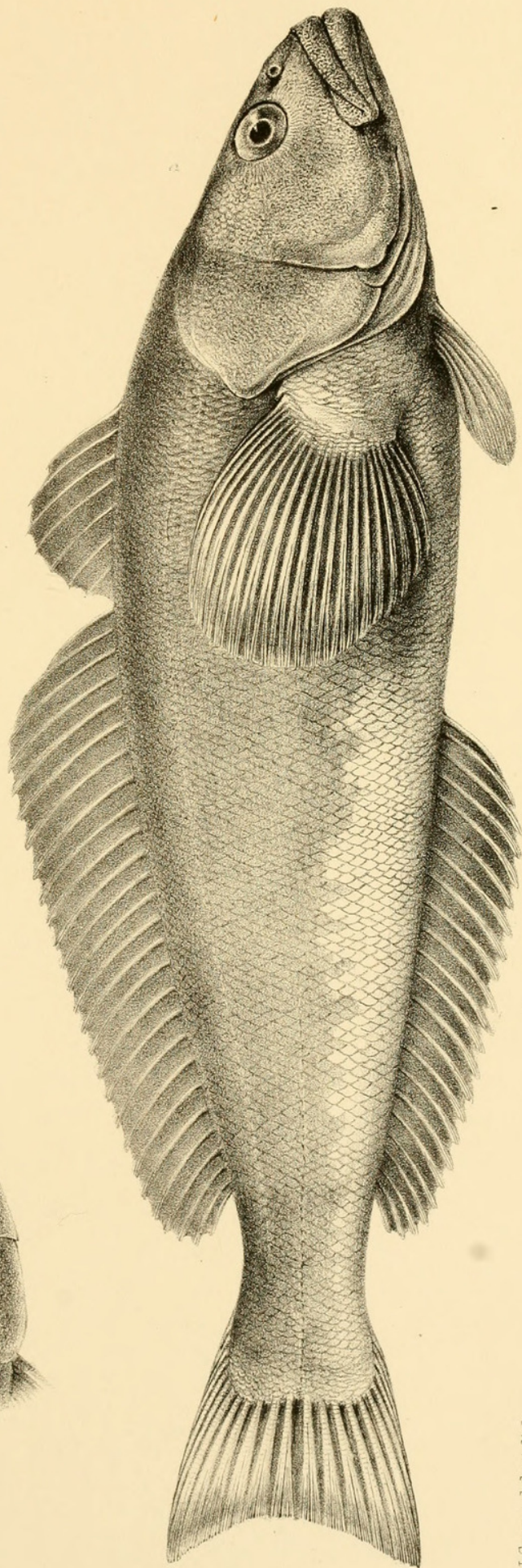
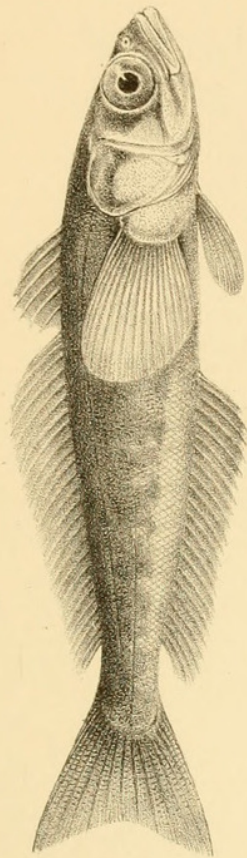
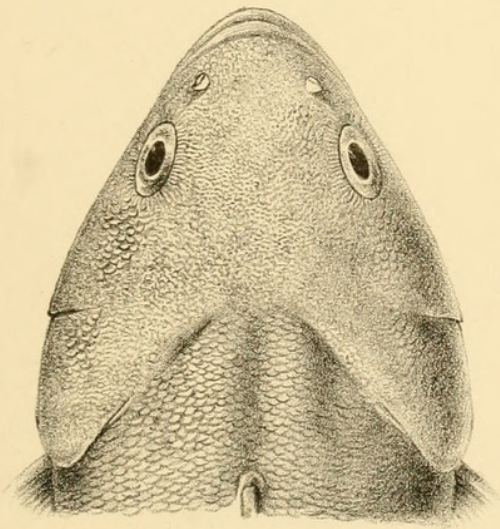


J Green del. et lith.

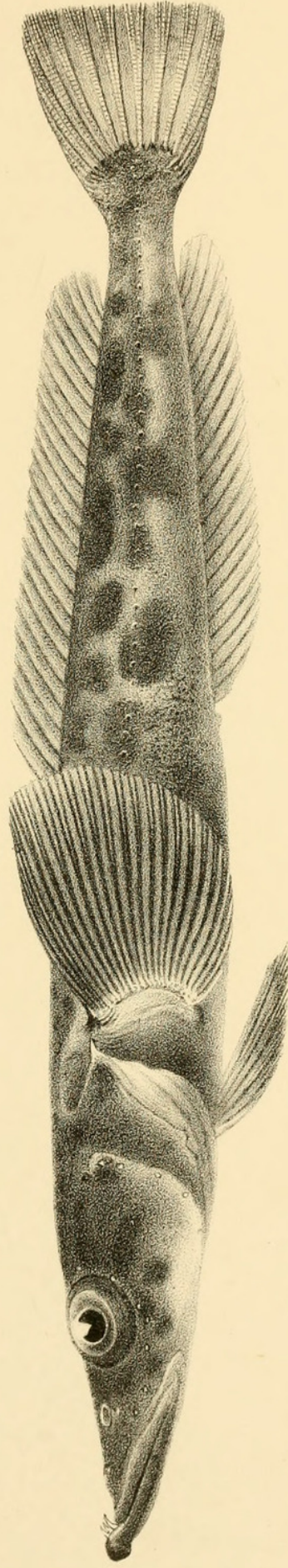
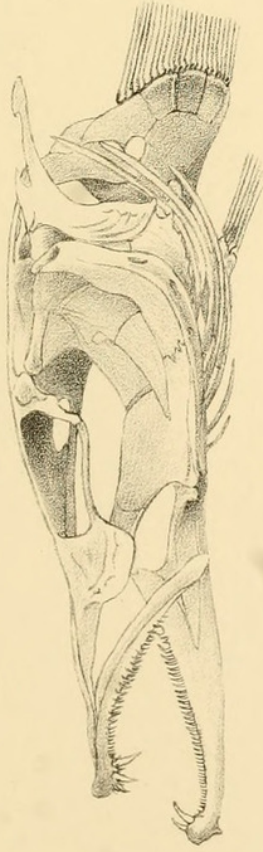
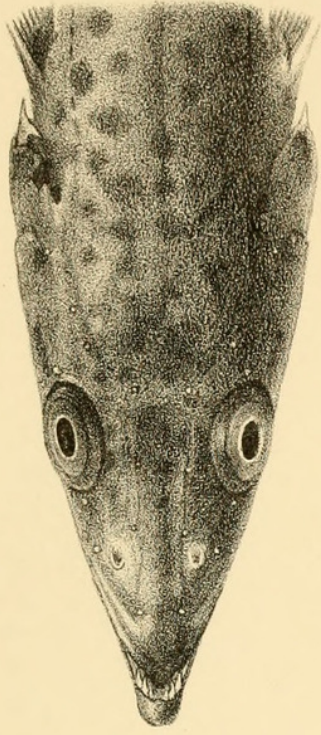
Mintern Bros imp.

TREMATOMUS BERNACCHII.









P. J. Smit del et lith.

Mintern Bros. imp.

GYMNODRACO ACUTICEPS.





Boulenger, George Albert. 1902. "Pisces." *Report on the collections of natural history made in the Antarctic regions during the voyage of the "Southern Cross."* 174–189.

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