

FISHES FROM THE DEEP WATER ON THE SOUTH COAST OF NEW ENGLAND OBTAINED BY THE UNITED STATES FISH COMMISSION IN THE SUMMER OF 1880.

By G. BROWN GOODE.

The following paper enumerates 51 species of fishes known to occur outside of the hundred-fathom curve along the southern coast of New England. Nearly all were obtained by the Fish Commission steamer "Fish Hawk" on its three trips to the "Lopholatilus Ground" in September. Several of the species were described a few weeks ago in another paper.

MALTHEIDÆ.

1. *Halieutæa senticosa*, new species.

A single small specimen (No. 26088) was obtained, September 13, from station 879, at a depth of 225 fathoms, and on October 2, from station 895, 238 fathoms, four specimens (No. 26175), ranging in length from 60<sup>mm</sup> to 140<sup>mm</sup>.

The occurrence on the Atlantic coast of the United States of a species of the genus *Halieutæa*, hitherto known only from China, is exceedingly interesting. A related genus, *Halieutichthys*, Poey, is represented in the West Indian fauna by the species *Halieutichthys aculeatus*.\*

DESCRIPTION.—Disk orbicular, nearly as wide as long; its length less than half that of the body; its lateral outlines prolonged on each side in a strong spine, armed at the tip with a group of irregularly arranged acicular spinelets. Body covered above with numerous stout, conical spines with stellular bases. These are largest upon the postdiscal portion of the body, where they are approximately arranged in about four irregular longitudinal rows upon each side of the dorsal fin. Closely set rows of these stout spines mark the outer margin of the disk, and there is also a cluster of five to seven upon each carpal peduncle. Outside of these marginal spines, upon each side, is an irregular marginal row of five depressed, knife-like spines, each tipped with a crown of three acicular spinelets. On the anterior margin of the disk the two rows of spines coalesce and form a bristling row of closely set spines, some pointing dorsally, some laterally, some ventrally. There are two kinds of spines upon the dorsal surface, in addition to the large ones already described: some large, somewhat remote from each other, conical, stellular; others, much more numerous and filling the interspaces, prickle-like, stellular. Belly armed with numerous closely set spines of a similar kind. Snout somewhat projecting, armed with three many-

\**Halieutichthys aculeatus* (Mitchill) Goode.

*Lophius aculeatus*, MITCHILL, Amer. Monthly Magazine, ii, 1818, p. 325 (specimen from Straits of Bahama).

*Halieutichthys aculeatus*, GOODE, Proc. U. S. Nat. Mus. ii, 1879, p. 109 (calling attention to Mitchill's description).—GOODE & BEAN, *ibid.* p. 333 (specimen from Key West).

*Halieutichthys reticulatus*, POEY, Proc. Acad. Nat. Sci. Phila. 1863, p. 91 (specimen from Cuba).

tipped spines. A spine-armed ridge in front of the eyes, over the top of the snout. In this four spines are conspicuous, one in front of each eye, and between these a larger pair, in front of the supraorbital ridges. From these last-mentioned spines extend spine-armed ridges along the upper margins of each orbit. Under the snout is a cavity containing a barbel, pedicelled, with thick, club-shaped, trilobate tip. On each side of this cavity are the nasal openings.

The width of the mouth is equal to the distance between the centers of the pupils of the eyes, this being much less than in *Halieutawa stellata*, in which the mouth is proportionally twice as large. The shape of the disk is less circular than in the Asiatic species, being intermediate between this form and *Halieutichthys*. Other points by which *H. stellata* may be distinguished are the absence of the strong lateral spines of the disk; the slighter specialization of the carpal peduncles; the greater proportionate size of the disk, which occupies two-thirds of the entire length of the fish; the less immediately axillary position of the gill-openings; the less spiny armature of the body, the spines upon the margin being smaller and less crowded; and the entire absence of spines upon the ventral surface.

D. 6; A. 4; C. 8; P. 13-15; V. 5. Color reddish gray, whitish below.

*Measurements.*

Current number of specimen .....		26175.	
Locality .....		Station 895.	
		Milli-	100ths
		meters.	of
			length.
Extreme length .....		140	.....
Length to base of middle caudal rays .....		118	100
Body:			
Greatest width of disk .....			50
Length of disk (snout to lateral spine) .....			47
Length of disk (snout to angle of pectoral) .....			47
Least height of tail .....			5
Length of body (outside of disk) .....			40
Head:			
Greatest length (to branchial opening) .....			39
Width of interorbital area .....			8
Length of snout .....			4
Width of mouth .....			16
Length of maxillary .....			9
Length of mandible .....			10
Diameter of orbit .....			8
Dorsal:			
Distance from snout .....			60
Length of base .....			8
Greatest height .....			14
Length of rostral barbel .....			2
Anal:			
Distance from snout .....			65
Length of base .....			5
Height at longest ray .....			14
Caudal:			
Length of middle rays .....			13
Pectoral:			
Distance of elbow from snout .....			52
Length .....			24
Ventral:			
Distance of free portion from snout .....			35
Length .....			6
Dorsal .....			4
Anal .....			8
Caudal .....			13-15
Pectoral .....			5
Ventral .....			

## LOPHIIDÆ.

2. *Lophius piscatorius*, Linn.

A specimen, No. 26170, 26<sup>cm</sup> long, containing immature ova, was taken at station 894, at a depth of 365 fathoms; also a large specimen with immature ova, No. 26098, from station 876, 120 fathoms; and a smaller one, perhaps two years old, No. 26070, from station 878, 142½ fathoms.

3. *Mancalias uranoscopus* (Murray) Gill.

*Ceratias uranoscopus*, MURRAY, in Wyville Thompson, *The Atlantic*, 1878, ii, p. 67, fig. 20 (Am. ed.).

*Mancalias uranoscopus*, GILL, *Proc. U. S. Nat. Mus.* i, 1878 (Oct. 17), p. 228.

A single specimen, No. 26159, 185<sup>mm</sup> long, was taken October 2 at station No. 893, at a depth of 372 fathoms. It is of much interest, only one specimen having hitherto been found. This was dredged July 23, 1873, by H. M. S. Challenger, southeast of Madeira (lat. 22° 18' N., long. 22° 2' W.), at a depth of 2,300 fathoms (temperature 1° 65' C.). Mr. Murray's description, which is sufficiently accurate except that our specimen has four instead of three rays in the second dorsal, runs as follows: The specimen is 90<sup>mm</sup> in length from the snout to the end of the tail, compressed laterally, and of a uniform black color. The anterior spine of the first dorsal fin is produced into a long filament, ending in a pear-shaped bulb, terminating in a very distinct, semi-transparent, whitish spot. This spine has its origin on the posterior portion of the head, and when laid back it reaches nearly to the tip of the tail. The second part of the first dorsal is placed far back on the body, and consists of two short, fleshy tubercles, which lie in a depression in front of the second dorsal fin. The second dorsal has three rays; the anal is opposite the second dorsal and has four rays; the caudal has eight rays, the four central rays being much larger than the others, and bifid. The pectorals are small and have ten very delicate rays. The gill-opening is a slit situated below the pectoral fin. The upper jaw is formed by the intermaxillaries, and is armed, together with the lower jaw, with a series of teeth of moderate size, which can be depressed inward as in *Lophius*. The skin is thickly covered with minute, embedded, conical spines. The eyes are very small and are placed high up on the middle of the head. The presence of a fish of this group at so great a depth is of special interest. From its structure, and from the analogy of its nearest allies, there seems to be no reasonable doubt that it lives on the bottom. It is the habit of many of the family to lie hidden in the mud, with the long dorsal filament and its terminal soft expansion exposed. It has been imagined that the expansion is used as a bait to allure its prey, but it seems more likely that it is a sense-organ intended to give notice of their approach.

## ANTENNARIIDÆ.

4. *Chaunax pictus*, Lowe.

*Chaunax pictus*, LOWE, Trans. Zool. Soc. Lond. iii, 1846, p. 339, pl. li.—GÜNTHER, Cat. Fish. Brit. Mus. iii, 1851, p. 200.—GILL, Proc. Acad. Nat. Sci. Phila. 1863, p. 90 (generic diagnosis in synopsis of family); Bull. U. S. Nat. Mus. i, 1878, p. 222.

A single small specimen of a species of *Chaunax*, 37<sup>mm</sup> long, was obtained September 4, at station 869, at a depth of 192 fathoms.

While there is a general agreement between the specimen described from Madeira by Lowe under the name *Chaunax pictus*\* and the immature individual of the same genus before me, there are certain characters, such as the slightly smaller number of fin-rays in dorsal and caudal, and the difference in the shape of these fins in the latter, which renders the question of their identity somewhat doubtful. I am unwilling, however, to establish a new specific name on this immature specimen, particularly since the shape of the fins is likely to be modified with age, and the difference in the radial formula is hardly of specific importance. The specimen is therefore provisionally referred to Lowe's species. A larger specimen from our coast is much to be wished for. Lowe's was 406<sup>mm</sup> (16 inches) long, and "was taken with an ordinary bait and line at the Picos, a rocky shoal about a league from the shore of Camera de Lobos, a village five or six miles to the westward of Funchal, on the 12th of March, 1846"; depth of water not stated. The color of this specimen was bright orange above, rosy at the sides, and with fins and tips vermilion; on the belly rosy white, with fins vermilion.

The color of our specimen, No. 26021, is brownish gray. The rostral tentacle is nearly as long as the diameter of the eye.

Radial formula: D. I, 10; A. 5; C. 7; V. [3]; P. 10.

*Measurements.*

	Milli- meters.	100ths of length.
Extreme length.....	37	.....
Length to base of middle caudal rays.....	27	100
Body:		
Greatest height.....		18
Greatest width.....		12
Least height of tail.....		4
Head:		
Greatest length (to branchial aperture).....		74
Greatest width.....		33
Width of interorbital area.....		15
Length of snout.....		11
Length of maxillary.....		20
Length of mandible.....		18
Diameter of orbit.....		5
Dorsal tentacle.....		4
Dorsal fin:		
Distance from snout.....		70
Anal:		
Distance from snout.....		74

\* 1846.—LOWE, Rev. R. T. On a New Genus of the Family *Lophidae* (Les Pectorales, Pediculées, Cuv.), discovered in Madeira. < Trans. Zool. Soc. London, iii, pp. 339 344, pl. li. Read Sept. 22, 1846.

Measurements—Continued.

	Milli- meters.	100ths of length.
Caudal:		
Length of middle rays .....		28
Pectoral:		
Distance from snout .....		64
Length .....		[10]
Ventral:		
Distance from snout .....		44
Length .....		[10]
Dorsal .....		1, 10
Anal .....		5
Caudal .....		7
Pectoral .....		10
Ventral .....		[3]

PLEURONECTIDÆ.

5. *Hippoglossus vulgaris*, Fleming.

*Pleuronectes hippoglossus*, LINN. Syst. Nat. ed. x, i, p. 269

*Hippoglossus vulgaris*, FLEMING, Brit. Animals, p. 199.—GÜNTHER, Cat. Fish. Brit. Mus. iv, 1862, p. 403.

*Hippoglossus americanus*, GILL, Proc. Acad. Nat. Sci. Phila. 1864, p. 220.

The New London halibut-smacks obtain many halibut on the south part of George's Banks and the neighboring shoals. An individual was taken, years ago, on the outer side of Fisher's Island, Connecticut. The halibut may, in all probability, be found to be abundant on the edge of the continental slope south of Cape Cod, since here have been recently obtained nearly all the species most constantly associated on the northern halibut grounds on the outer edges of La Have, Brown's, Sable Island, and other banks off the coast of Nova Scotia and Newfoundland.

6. *Hippoglossoides platessoides* (Fabricius) Gill.

*Pleuronectes platessoides*, FABRICIUS, Fauna Groenlandica, 1780, p. 164 (excellent description).—"Vidensk. Selsk. Naturv. och Mathem. Afhandl. i, p. 50, pl. ii, fig. 2."

*Citharus platessoides*, REINHARDT, *ibid.* vii, 1838, p. 130.—KRÖYER, in Gaimard, Voyages en Scandinavie, etc. pls. xxi (excellent figure).

*Drepano(p)setta platessoides*, GILL, Cat. Fish. E. Coast N. America, 1861, p. 50.

*Hippoglossoides platessoides*, GILL, Proc. Acad. Nat. Sci. Phila. 1864, p. 217.—GOODE & BEAN, Cat. Fish. Essex Inst. 1879, p. 7.

*Platessa dentata* (not *Pleuronectes dentatus*, Mitchill), STORER, Rep. Fish. Mass. 1839, p. 143; Hist. Fish. Mass. 1867, p. 197, pl. xxx, fig. 3.

*Hippoglossoides dentatus*, GILL, Cat. Fish. E. Coast N. A. 1861, p. 50.—GÜNTHER, Cat. Fish. Brit. Mus. iv, 1862, p. 406.

*Pomatopsetta dentata*, GILL, Proc. Acad. Nat. Sci. 1864, p. 217 (with def. of *Pomatopsetta*, p. 216).

*Hippoglossoides limandoides*, GOODE & BEAN, Amer. Journ. Sci. & Arts, xvii, 1876, p. 39.

Not unusual in deep water off Southern Massachusetts and Rhode Island, approaching the coasts in winter, but not taken in these trips of the Fish Commission steamer.

**7. Paralichthys oblongus**, (Mitchill) Jordan.

- Pleuronectes oblonga*, MITCHILL, Trans. Lit. & Phil. Soc. N. Y. i, 1814, p. 391.  
*Platessa oblonga*, STORER, Syn. Fish. N. A. p. 225.—DEKAY, Zool. N. Y. Fish. 1842, p. 299, pl. xlviii, fig. 156.  
*Chænopsetta oblonga*, GILL, Cat. Fish. E. Coast N. A. 1831, p. 50 (name of genus proposed; no definition); Proc. Acad. Nat. Sci. Phila. 1834, p. 218 218 (genus defined p. 216).  
*Pseudorhombus oblongus*, GÜNTHER, Cat. Fish. Brit. Mus. iv, 1834, p. 423.—GOODE & BEAN, Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 7.  
*Paralichthys oblongus*, JORDAN, MSS.  
*Platessa quadrocellata*, STORER, Proc. Bost. Soc. Nat. Hist. ii, 1847, p. 242; Hist. Fish. Mass. 1867, p. 203, pl. xxxi, fig. 3.  
*Platessa quadrocularis*, GILL, Cat. Fish. E. Coast N. A. 1831, p. 51.

Specimens were obtained at the following trawling stations: No. 26078, from station 873, 100 fathoms.

**8. Monolene sessilicauda**, Goode.

- Monolene sessilicauda*, GOODE, Proc. U. S. Nat. Mus. iii, 1880, p. 338.

Specimens were obtained from the following stations:

	Fathoms.
No. 26004, stations 870, 871.....	150-115
No. 26099, station 876.....	120
No. 26109, station 877.....	126

**9. Citharichthys arctifrons**, Goode.

- Citharichthys arctifrons*, GOODE, Proc. U. S. Nat. Mus. iii, 1880, p. 341.

Specimens were obtained from the following stations:

	Fathoms.
Nos. 25908, 26130, station 871.....	115
Nos. 26100, 26101, station 872.....	85
No. 26117, station 876.....	120
No. 26118, station 876.....	120
No. 26124, station 878.....	142½
No. 26129, station 874.....	85
“ station 870.....	155

**10. Citharichthys unicornis**, Goode.

- Citharichthys unicornis*, GOODE, Proc. U. S. Nat. Mus. iii, 1880, p. 342.

Specimens were obtained as follows:

	Fathoms.
No. 26003, station 870.....	155
No. 26003, station 871.....	155

**11. Limanda ferruginea** (Storer) Goode & Bean.

- Platessa ferruginea*, STORER, Hist. Fish. Mass. 1867, p. 198, pl. xxx, fig. 4.  
*Myzopsetta ferruginea*, GILL, Cat. Fish. E. Coast N. A. 1831, p. 51 (genus not defined); Proc. Acad. Nat. Sci. Phila. 1834, p. 217 (genus defined), *et alibi*.  
*Pleuronectes ferrugineus*, GÜNTHER, Cat. Fish. Brit. Mus. iv, 1832, p. 447.  
*Limanda ferruginea*, GOODE & BEAN, List Fish. Essex Co. & Mass. Bay, 1879, p. 6.  
*Platessa rostrata*, H. R. STORER, Boston Journ. Nat. Hist. v, 1857, p. 268, pl. viii, fig. 2.  
*Myzopsetta rostrata*, GILL, ll. c.

Numerous specimens were taken in 1874, 1875, and 1880 south of Cape Cod, in deep, cold water. The most southern locality is the *Pecten* Ground off Watch Hill.

12. *Limanda Beanii*, new species.

Two specimens, No. 26102, were obtained—one from station 875, at a depth of 126 fathoms; one from station 876, 120 fathoms—which are provisionally referred to the genus *Limanda*, Gottsche, as understood by American ichthyologists. The species surely belongs to *Pleuronectes*, as limited by Günther, the weight of whose opinion regarding the difficulties of making generic divisions in this group is fully appreciated. The extreme brevity of the snout and the elongate-elliptical form of the body render its shape very unlike that of *Limanda ferruginea* of our own coast and *Limanda platessoides* of the Eastern Atlantic. In its general appearance, except that the ventrals are not both lateral, it resembles considerably the species mentioned above.

DESCRIPTION.—The body is elliptical in form, with angular outlines. Its height is three-eighths (38) of its total length, and slightly more than twice the length of the head, and about three times the greatest height of the anal fin. Its height at the ventrals (25) is one-fourth of its length and less than distance from snout to origin of anal. Its least height, at base of tail (12), is half its height at ventrals. It is thin, its greatest width (7) not exceeding the diameter of the orbit.

The scales are subcircular, small, strongly pectinate on the colored side, cycloid on the blind side, where they are also larger, there being about fifty (as nearly as can be counted in the specimens before me) in the lateral line, behind the curve, while on the colored side there are probably sixty. The lateral line on the colored side makes a very abrupt, conspicuous, angular, high curve over the pectoral fin. The chord of this arc is nearly as long as the head of the fish, its height half as great. The scales in the lateral line are highly specialized, particularly along the curve, which appears to contain about twenty-seven of them, while posterior to this, in the straight portion, there are about sixty. The specialized scales of the lateral line extend far out upon the caudal fin. On the blind side the lateral line is little conspicuous, the scales very slightly specialized, and it becomes obsolete in the region where, upon the colored side, the curve is located. The scales extend far out upon the caudal fin, but are not present upon the other fins.

The head is very short, its length (18) contained about five times and one-half in the total. The snout is very short (2), one-fiftieth of the total, and the mouth is small, its cleft subvertical, and the maxillary extending very slightly behind the anterior margin of the orbit. The teeth are inconspicuous, apparently in two rows, stronger and more numerous on the blind side, barely discernable in upper jaw, absent elsewhere in the mouth.

The eyes are large, prominent; their diameters (7) greater than the length of the maxillary (6) and equal to that of the mandible (6). They are very closely set, the interorbital space marked by a knife-like edge of bone. The upper eye, in its outline trenching upon the dorsal outline of the head, is almost directly above its mate. Together they occupy

nearly three-fourths of the width of the head at the perpendicular passing through their centers.

The dorsal fin begins over the posterior part of the pupil of the upper eye. Its rays are long, widely separated, and with their tips protruding beyond the membrane, giving to this, as also to the anal, a ragged, irregular appearance. Its greatest height (8) is equal to half the length of the head. The anal is inserted under the axil of the pectoral, and its height is about the same as that of the dorsal.

The length of the caudal (20) is equal to one-fifth of that of the body, without including caudal. It is broad, fan-shaped, acutely convex in outline. The distance of the ventral from the snout (28) is about one-third the length of the base of the dorsal. The arrangement of these fins upon the ventral keel is much as in *Limanda ferruginea*, the right fin being almost upon the median line. The pectorals are normal.

The color is grayish brown, mottled with darker patches. There is a conspicuous black blotch upon the outer rays of the caudal on either side.

Radial formula: D. 64; A. 63; C. 18; P. 7; V. 6; lateral line about 88.

This species is dedicated to my associate Dr. Tarleton H. Bean, of the United States National Museum.

*Measurements.*

Current number of specimen.....	26102.	
Locality.....	Stations 875-6.	
	Milli- meters.	100ths of length.
Extreme length.....	135	.....
Length to base of middle caudal rays.....	111	100
Body:		
Greatest height.....		38
Greatest width.....		7
Height at ventrals.....		25
Least height of tail.....		12
Head:		
Greatest length.....		18
Width of interorbital area.....		5
Length of snout.....		2
Postorbital portion of head.....		9
Length of maxillary.....		6
Length of mandible.....		7
Diameter of orbit.....		7
Dorsal:		
Distance from snout.....		9
Length of base.....		83
Greatest height.....		8
Anal:		
Distance from snout.....		28
Length of base.....		70
Caudal:		
Length of middle rays.....		20
Pectoral:		
Distance from snout.....		17
Length.....		9
Ventral:		
Distance from snout.....		17
Length.....		9
Dorsal.....		64
Anal.....		63
Caudal.....		18
Pectoral.....		7
Ventral.....		6 R.
Number of scales in lateral line (ca.).....	88 (27 in curve).	



**13. Glyptocephalus cynoglossus** (Linn.) Gill.

*Pleuronectes cynoglossus*, LINNÆUS, Syst. Nat. ed. x, i, 1758, p. 269.

*Glyptocephalus cynoglossus*, GILL, Proc. Acad. Nat. Sci. Phila. 1873, p. 161.—  
GOODE & BEAN, Proc. U. S. Nat. Mus. i, 1878, p. 21 (with extensive  
synonymy).

Numerous specimens of various sizes, from the young of two centi-  
meters to the adult of fifty centimeters, were taken in the following  
localities:

**14. Thyris pellicidus**, Goode.

*Thyris pellicidus*, GOODE, Proc. U. S. Nat. Mus. iii, 1880, p. 344.

Specimens were obtained from the following localities:

	Fathoms.
No. 26005, station 871.....	115
No. 26006, station 872.....	86

MACRURIDÆ.

**15. Macrurus Fabricii**, Sundeval.

*Macrurus Fabricii*, SUNDEVAL, "Vet. Akad. Handl. 1840, p. 6".—GOODE &  
BEAN, Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 7.

*Macrurus rupestris*, GÜNTHER, Cat. Fish. Brit. Mus. iv, 1862, p. 390.

There can be little doubt that this species occurs south of Cape Cod,  
though no living specimens have yet been obtained. The first specimen  
found on the coast of the United States was picked up at sea, floating,  
somewhere off Gravesend, N. Y.

**16. Macrurus Bairdii**, Goode & Bean.

*Macrurus Bairdii*, GOODE & BEAN, Amer. Journ. Sci. & Arts, xiv, 1877, pp.  
471-473 (Massachusetts Bay); Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 7.

Specimens were obtained from the following localities:

	Fathoms.
No. 26062, stations 879-880.....	225-252
Nos. 26163, 26166, 26187, 26194, station 893.....	372
Nos. 26168, 26194, 26217, 26218, station 894.....	365
Nos. 26191, 26195, 26210, station 895.....	233
No. 26193, station 892.....	487
Nos. 26212, 26217, 26218, station 891.....	487

**17. Macrurus carminatus**, Goode.

*Macrurus carminatus*, GOODE, Proc. U. S. Nat. Mus. iii, 1880, p. 346.

Specimens were obtained from the following localities:

	Fathoms.
No. 26001, station 871.....	115

GADIDÆ.

**18. Gadus morrhua**, Linnæus.

The cod occurs in deep water on this portion of the coast.

**19. Phycis chuss.**

Several specimens apparently of this species were obtained outside  
of the hundred-fathom curve.

20. *Phycis Chesteri*, Goode & Bean.

*Phycis Chesteri*, GOODE & BEAN, Proc. U. S. Nat. Mus. i, 1878, p. 256; Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 8.

Numerous specimens, old and young, were found at stations 878, 142 fathoms; 879, 225 fathoms; 880, 252 fathoms; 881, 325 fathoms; 892, 487 fathoms; 895, 238 fathoms.

This species and *Macrurus Bairdii* appear to be the most abundant fishes of this district, occurring in immense numbers and breeding copiously.

21. *Phycis regius* (Walbaum) Jordan & Gilbert.

*Blennius regius*, WALBAUM, Artedi, 1792, p. 186.

*Urophycis regius*, GILL, Proc. Acad. Nat. Sci. Phila. 1863, p. 240.

*Phycis regius*, JORDAN & GILBERT, Proc. U. S. Nat. Mus. i, 1878, p. 371.—GOODE & BEAN, Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 8.—BEAN, Proc. U. S. Nat. Mus. iii, 1880, p. 70.

*Euchelyopus regalis*, SCHNEIDER, Bloch. Syst. Ichth. i (cloth), 1801, p. 33.

*Phycis regalis*, KAUP, Archiv für Naturg. 1858, p. 89.—GILL, Cat. Fish. E. Coast N. A. 1861, p. 49.—GÜNTHER, Cat. Fish. Brit. Mus. iv, 1862, p. 354.

"*Gadus bleunioides*, MITCHILL, Medical Register, 1814."

*Gadus punctatus*, MITCHILL, *ibid.*

*Phycis punctatus*, DEKAY, Zool. N. Y. Fish. 1842, p. 292, pl. xlvi, fig. 149.

A specimen was obtained at station 870, in 155 fathoms of water. The distribution of this species is very puzzling. It has been found at Halifax, Nova Scotia, and south to the Cape Fear River, but seems nowhere abundant except about Long Island.

22. *Haloporphyrus viola* Goode & Bean.

*Haloporphyrus viola*, GOODE & BEAN, Proc. U. S. Nat. Mus. i, 1878, p. 257; Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 8.

Specimens were taken October 2, at station 893, in 372 fathoms of water. The species has never before been found except on the outer edges of the Nova Scotia banks.

23. *Enchelyopus cimbrius* (Linn.) Jordan.

*Gadus cimbrius*, LINNÆUS, Syst. Nat. ed. x, i.

*Onos cimbrius*, GOODE & BEAN, Proc. U. S. Nat. Mus. i, 1878, p. 349 (with full synonymy); Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 8.

*Euchelyopus cimbrius*, JORDAN, MSS.

Several specimens were obtained outside the hundred-fathom curve.

24. *Merlucius bilinearis* (Mitchill) Gill.

Numerous specimens of old and young were taken September 4, September 13, and October 2, in almost every haul of the trawl-nets, at whatever depth. The adults appeared to be in the middle of the spawning season, the eggs being separated in the ovaries and flowing easily in specimens taken at the depth of 250 and 487 fathoms. This phenomenon is of the greatest interest and importance, since it may serve to illustrate how other species, common near the shores, such as the menhaden (*Brecoortia tyrannus*) and the bluefish (*Pomatomus saltatrix*), retreat to deep water to spawn.

25. *Hypsicometes gobioides*, Goode.

*Hypsicometes gobioides*, GOODE, Proc. U. S. Nat. Mus. iii, 1880, p. 348.

A single specimen of this puzzling little stranger was obtained at station 871, in 115 fathoms of water.

STICHLÆIDÆ.

26. *Eumesogrammus subbifurcatus* (Storer) Gill.

A single specimen of this arctic species was obtained off the mouths of Newport Harbor.

LYCODIDÆ.

27. *Lycodes Verrillii*, Goode & Bean.

*Lycodes Verrillii*, GOODE & BEAN, Amer. Journ. Sci. & Arts, xvi, 1877, p. 474; Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 9.

Specimens were obtained at the following localities: Stations 870, 155 fathoms; 879, 225 fathoms; 880, 252½ fathoms; 881, 325 fathoms; 893, 372 fathoms; 895, 238 fathoms; often in considerable abundance.

28. *Lycodes paxillus*, Goode & Bean.

*Lycodes paxillus*, GOODE & BEAN, Proc. U. S. Nat. Mus. ii, 1879, p. 44; Cat. Fish. Essex Co. & Mass. Bay, 1879, p. 9.

Two specimens, No. 26181, came from stations 891 and 894, 487 and 365 fathoms. The unique specimen previously known was obtained by Captain Collins in the gully between La Have and Sable Island Banks. The enormous development of the buccal muscles appears to be a character acquired in old age, as also the special peculiarities of dentition mentioned in the description.

ANARRHICADIDÆ.

29. *Anarrhichas lupus*, Linnæus.

A single small specimen, about 30<sup>mm</sup> in length, was obtained at station 866, in 65 fathoms. At the time of writing the present notice this is not available for examination, but it is believed to be the young of *Anarrhichas lupus*, never before recorded south of Cape Cod.

LIPARIDIDÆ.

30. *Liparis* sp.

Specimens of a *Liparis* closely resembling *L. ranula*, Goode & Bean, were obtained at station 879, and are preserved for future discussion.

COTTIDÆ.

31. *Amitra liparina*, new genus and new species (*Cottida*).

Two specimens of the fish here described were obtained, October 2, at station 891, in 487 fathoms; one, No. 26184, 164<sup>mm</sup> long; also a smaller one, 55<sup>mm</sup>. Their structure was so peculiar that I have long hesitated to describe them. They are evidently Liparoid fishes, without ventral fins or ventral disk. Professor Jordan and Dr. Bean have examined

them with me, and the decision has been reached that they should be placed in a new genus of the family *Cottidae*. Professor Jordan considers this genus as forming one of the most abnormal types of *Cottidae*, approached through *Cottunculus* and *Psychrolutes*, and also closely allied to *Liparidae*.

AMITRA, new genus.

Cottoid fishes, with small head, elongate, attenuate, body covered with thick, lax, slimy skin. Ventral fins absent. Opercular stray present. Pseudobranchiæ present. Gills  $3\frac{1}{2}$ , without slit behind last (?). Gill-openings closed below, restricted to small slits under the very small operculum. Operculum very small, strap-shaped. Lower jaw included within the upper. Teeth weak, paved. First five rays of the dorsal non-articulate, the others grading gradually into the flexible rings.

32. *Amitra liparina*, new species.

DESCRIPTION.—Body elongate, compressed posteriorly, very thin at the tail, covered with a gelatinous, lax, transparent skin, which is separated from the body and the fins by a filmy, mucous intertissue. Greatest height of body (18) contained five and one-half times in its length, without caudal.

Head thick, convex between eyes, its greatest width (11) nearly three-fourths its length (15), which is contained six and two-third times in the length of the body. Snout convex, protruding. Mouth under the snout and far back from its tip. Eyes lateral, in diameter (3) about half the width of the interorbital area (5). Nostril in front of eye. Porés along the upper lip. When the head is viewed from directly in front the opening of the mouth seems to be convex upward.

The dorsal fin begins over the end of the pectoral, and the rays and outline of this, as well as of the anal, are hardly visible through the thick, lax skin. The rays are thick, but very flexible. The anal begins under the eighth to tenth dorsal ray. The dorsal and anal rays lie closely connected with those of the caudal, which are somewhat larger, and extend in a pencil-like point.

The pectoral is broad, its lower base almost under the posterior margin of the orbit. It is composed of twenty-three rays, the six lowest of which are prolonged beyond the lower rays contiguous. The jugular disk cannot be found.

Radial formula: D. 67; A. 54; C. 6; P. 23.

Color: Yellowish white, dusky toward the tail and blackish upon the anterior part of the head. Abdominal cavity showing black through the skin.

Two other specimens of this or a related species were obtained (No. 26179) from station 894, in 365 fathoms of water, but they are in poor condition and cannot at present be made out.

*Measurements.*

Current number of specimen .....	26184.	
Locality .....	Station 487.	
	Milli- meters.	100ths of length.
Extreme length .....	164	.....
Length to base of middle caudal rays .....	150	100
Body:		
Greatest height .....		18
Greatest width .....		9
Head:		
Greatest length .....		15
Greatest width .....		11
Width of interorbital area .....		5
Length of snout .....		4
Diameter of orbit .....		3
Dorsal:		
Distance from snout .....		30
Greatest height .....		6
Anal:		
Distance from snout .....		37
Height at longest ray .....		5
Caudal:		
Length of middle rays .....		9
Pectoral:		
Distance from snout (below) .....		8
Length .....		10
Dorsal .....		67
Anal .....		54
Caudal .....		6
Pectoral .....		23

**33. *Cottunculus microps*, Collett.**

*Cottunculus microps*, COLLETT, Tillhægsh. til Vidensk.-Selsk. Forh. Christiania, 1864, p. 20, pl. i, figs. 1-3; Norges Fiske, 1875, p. 20, pl. i, figs. 1-3; Fiske Nordhavs-Expeditionen, 1878, p. 20; Meddelelser om Norges-Fiske Arena, 1875-78, 1879, p. 11.

Specimens from the following localities have been obtained:

	Fathoms.
No. 26087 (1), station 880 .....	252½
No. 26167 (3), station 892 .....	372
station 894 .....	365
station 895 .....	238
No. 26176 (3), station 895 .....	238
No. 26140 (1), station 880 .....	252½

The largest measures 265<sup>mm</sup>, the smallest 25<sup>mm</sup>. This species, never before found except on the Norwegian coast, was described from a specimen measuring 15<sup>mm</sup>, dredged by Prof. G. O. Sars at Hasvig, near Hammerfest, in 200 fathoms, August, 1874; another, 50<sup>mm</sup> long, near Trondhjemsfjord, in 1878, by Mr. Storm, at a depth of 180 fathoms; again, at a depth of 191 fathoms, 18 miles northwest from Hammerfest (72° 27' N., 20° 51' W.), in temperature 3° 5' C., and at a depth of 459 fathoms; 15 miles westward of Northwestern Spitzbergen (79° 59' N., 5° 40' W.), with temperature of 1° C.

**34. *Cottunculus torvus*, new species, undescribed.**

A smooth-skinned species of *Cottunculus* was also obtained. This is reserved for future discussion.

## AGONIDÆ.

35. *Peristedium miniatum*, Goode.

*Peristedium miniatum*, GOODE, Proc. U. S. Nat. Mus. iii, 1880, p. 349.

Specimens were obtained from the following localities:

	Fathoms.
No. 26023, station 869.....	192
No. 26030, station 871.....	115
No. 26083, station 876.....	120

As has already been stated, adults and young were found, the former full of nearly ripe eggs.

36. *Aspidophoroides monopterygius* (Bloch) Valenciennes.

In 1874 a head of an individual of this species was dredged up on the "Pecten Ground" off Watch Hill, R. I. This is the sole instance of its capture south of Cape Cod, though there can be little doubt that it is of frequent occurrence in the districts recently explored by the Commission.

37. *Sebastes marinus*, Linnæus.

Numerous small individuals of this species were taken in nearly every haul of the trawl-net down to the depth of 155 fathoms.

38. *Setarches parmatus*, new species.

A single specimen, No. 28084, was obtained at locality 876, in 120 fathoms. The young fish, 52<sup>mm</sup> long, was taken in company with numerous young specimens of *Sebastes marinus*, from which it differs in many very striking respects.

It appears to belong to the type described by Johnson under the name *Setarches*.\*

It is, however, much stouter and higher than the other known species of this genus, *Setarches Güntheri*, from which, too, it differs in having 10 instead of 11 spines in the first dorsal, and 6 instead of 5 rays in the ventrals. The height of the body (38) is three-eighths of its standard length. The length of the head (45) is nine-twentieths of the same. The diameter of the eye (12) is contained less than four times in the length of the head (45). The scales are small, cycloid, each with several concentric furrows.

The specimen is so young, and mutilated withal, that it seems scarcely desirable to prepare an elaborate specific diagnosis. I append, however, a table of measurements, from which the other proportions of the body may readily be deduced, hoping soon to secure materials for a better description. *Setarches parmatus* may readily be distinguished from *Sebastes marinus* by its more generous proportions, as well as by the generic characters already mentioned. The height of the body is three-eighths of

\* Proc. Zool. Soc. London, 1862, p. 177; *Setarches Güntheri*, n. s. Madeira, p. 177, pl. xxiii.

its length instead of one-fourth; its width is one-fourth instead of three-twentieths; the length of the head nine-twentieths instead of three-eighths. The width of the interorbital area is half the length of the upper jaw instead of one-fourth, and is nearly equal to instead of one-half of the diameter of the orbit. The vertical fins are inserted further back, the paired fins farther forward, and the fins are, without exception, longer. The tail appears to be truncate instead of emarginate, as in *S. marinus*. The preopercular spines are very prominent. The spinous dorsal contains ten spines.

Measurements.

Species: *Setarches parmatius*.

Current number of specimen .....	26084 Station 876.	
Locality .....		
	Milime- ters.	100ths of length.
Extreme length .....	52	
Length to base of middle caudal rays .....	43	100
Body:		
Greatest height .....		38
Greatest width .....		23
Least height of tail .....		9
Head:		
Greatest length .....		45
Width of interorbital area .....		10
Length of snout .....		10
Length of operculum .....		13
Length of upper jaw .....		23
Diameter of orbit .....		12
Dorsal:		
Distance from snout .....		42
Length of base .....		34
Greatest height at fourth spine .....		23
Height at first spine .....		10
Height at second spine .....		18
Height at third spine .....		22
(Soft) length of base .....		Mutilated.
Anal:		
Distance from snout .....		80
Length of base .....		12
Height at first spine .....		7
Height at second spine .....		14
Height at third spine .....		14
Height at longest ray .....		15
Caudal:		
Length of middle rays .....		24
Pectoral:		
Distance from snout .....		44
Length .....		44
Ventral:		
Distance from snout .....		44
Length .....		25
Dorsal .....		X, 6+
Anal .....		III, 6

XIPHIIDÆ.

39. *Xiphias gladius*, Linn.

A fishing smack from Noank, Conn., was engaged by Professor Baird to set a trawl on the edge of the oceanic slope, in the hope of obtaining more specimens of *Lopholatilus*. Their only capture was a sword-fish thirteen feet long and weighing over 600 pounds. This was brought up from the bottom on the trawl-line. There is room for much question whether it was taken at the bottom or fastened itself to the

hooks as the line was being lowered, and was carried by its weight to the bottom. This curious freak of the sword fish, so often observed of late, deserves careful study.

### LATILIDÆ.

#### 40. *Lopholatilus chamæleonticeps*, Goode & Bean.

*Lopholatilus chamæleonticeps*, GOODE & BEAN, Proc. U. S. Nat. Mus. ii, 1879, p. 205.

In July, 1879, numerous specimens of this remarkable fish were taken by Gloucester fishing vessels, at a depth of 84 fathoms, 80 miles south by east from Noman's Land. The first trip of the "Fish Hawk" to deep water from Newport was September 4, and the nets were hauled as nearly as possible on the same grounds where *Lopholatilus* had previously been taken.

The second trip, ten days later, was to a region about forty miles farther west, and on this occasion six or more large individuals of this species were brought up on a hand line ("ladder-line") set from an open boat sent out from the steamer. None were at any time taken in the trawl-nets, though there is every reason to believe from the success of the fishing vessels previously, and from the number taken on the hand-line by the men in the small boat, that they are exceedingly abundant in this locality and probably for hundreds of miles in either direction, or at any rate to the south.

The *Lopholatilus* may yet prove to be a fish of economic importance. Its suitability for food was tested at the ward-room table of the "Fish Hawk", and it was pronounced equal to cod-fish, though somewhat finer grained in flesh.

The following notes upon color and internal structure were taken from a fresh specimen. The colors are very beautiful, and in general appearance when taken from the water it is one of the loveliest fishes I have ever seen, no exception being made in favor of the brilliant parrot-fishes or angel-fishes of the West Indian coral groves.

*Color*.—Black bluish, with a green tinge, iridescent, changing through purplish blue and bluish gray to rosy white below, and milky white toward the medium line of the belly. Head rosy, iridescent, with red tints most abundant on the forehead, blue under the eyes cheeks fawn-colored. Throat and under side of the head pearly white; with an occasional tint of lemon-yellow; this is most pronounced in front of the ventrals and on the anterior portion of ventral fins. Back with numerous maculations of bright lemon or golden. Anal purplish, with blue and rose tints, iridescent. Margin of anal rich purplish blue, iridescent like the most beautiful mother of pearl. This color prevailing more or less the whole fin, which has large yellow maculations. The lower border is rose-colored like the belly, and the base of the fin also partakes of this general hue. Dashes of milk-white on the base of the anal between the rays.



Dorsal gray. In front of the seventh dorsal the upper third posterior to the upper two-thirds dark brown. Spots of yellow, large, elongate, on or near the rays. Adipose fin whitish brown or yellow; a large group of bright yellow, confluent spots at the base.

Pectorals sepia colored with rosy and purplish iridescence.

*Viscera*.—Stomach small, siphonal, barely more than a loop in the very large intestine. Alimentary canal short, stomach and intestine when stretched out at full length extending from the diaphragm to the caudal. A loop in the intestine immediately posterior to the stomach. Liver with two lobes, nearly equal in length, light chestnut-brown. Gall-bladder large, pendant, pear-shaped, with long duct. Swim-bladder simple, with thick muscular walls, strongly attached to roof of abdominal cavity by numerous root-like appendages, resembling somewhat those of *Pogonias*. Spleen two-thirds as long as gall-bladder.

#### CHAULIODONTIDÆ.

##### 41. *Chauliodus Sloanii*, Schneider.

*Chauliodus Sloanii*, SCHNEIDER, Bloch. Syst. Ichth. 1801, p. 430, tab. lxxxv (as *C. setinotus*).

*Chauliodus Sloanii*, GÜNTHER, Cat. Fish. Brit. Mus. v, 1864, p. 392.

A single individual, No. 26165, 105<sup>mm</sup> long, was taken from station 892, in 487 fathoms. The only other specimen recorded is that from the stomach of a codfish from George's Banks, preserved in the museum of the Essex Institute.

Radial formula of No. 26165: D. 6; A. 12.

#### SCOPELIDÆ.

##### 42. *Myctophum*, sp.

A species, apparently undescribed, was obtained in several of the deep hauls. It is reserved for comparison with numerous other specimens of the group, as yet unelaborated, obtained by the Commission from the deep waters of the Atlantic.

#### MICROSTOMIDÆ.

##### *Hyphalonedrus chalybeius*, new genus and new species.

Numerous specimens (No. 26092) of a form closely related to *Argentina* were taken, September 13, at stations 876 and 878, 120 and 142 fathoms. They are considered to represent a new generic type.\*

##### HYPHALONEDRUS, new genus.

A genus of Microstomatid fishes. Body rounded, terete. Cleft of mouth extending under the anterior third (at least) of the orbit. Eye large. Teeth in the jaws small, sharp, on the edges of the bony lips. Tongue entirely smooth. Tip of lower jaw projecting. Dorsal fin short, inserted midway in space between insertions of pectorals and ventrals.

\*Etymology: *ὑφαλος* = under the sea + *ἔνδρος* = a dweller.

Gill-arches 4. Pseudobranchiæ present. Scales moderate, pronouncedly pectinate.

The genus *Silus* Gill\* was founded upon a misconception. The scales of *Argentina silus* (Cuv.) Nilss., are "dentigerous," it is true, but not ctenoid. They are true cycloid scales, with dentigerous surfaces. The diagnosis of *Silus* Gill would include the form above described, but, as has been remarked, it was founded upon a misunderstanding, and there can be no question as to what his intention may have been.

**43. Hyphalonedrus chalybeius, new species.**

DESCRIPTION.—Body plump, terete, its height (16) contained six times and one-fourth in its length, its width (13) seven and three-fourths. The height at ventrals (16) is equal to that of the origin of dorsal, the dorsal being inserted at the highest portion of the body, its middle over the origin of the ventrals. The least height of the tail is half that of the body. The scales are moderately strong, and sharply pectinated at the edge, and arranged in regular transverse rows, overlapping in such a manner as to resemble oblique plates upon the sides. The lateral line is prominent, straight, containing about 52 scales. Between the lateral line and the origin of the dorsal are  $6\frac{1}{2}$  scales, the origin of the ventral 6. The greatest length of the head to the end of the flexible flap of the operculum (27) slightly exceeds one-fourth of the body-length, and is itself slightly more than four times the length of the snout (6). The longitudinal diameter of the orbit (8) is four times that of the interorbital space (2). The maxillary, broad and flattened posteriorly, is in length (10) one-tenth of the body, and extends back to a perpendicular from the anterior margin of the pupil. The articulation of the mandible is in advance of the posterior tip of the maxillary, its length (11) slightly greater, and it protrudes beyond the snout, when the mouth is open, a distance greater than the width of the interorbital area. When the mouth is closed its tip still projects noticeably.

The dorsal fin is located almost midway between the snout and the adipose dorsal. Its height is almost equal (19) to that of the ventral (18). The adipose dorsal is over the middle of the anal, its length half the diameter of the orbit.

The distance of the anal from the snout (76) is about three-fourths of the body-length. Its length of base (6) is equal to the length of the snout; its height (10) to that of the middle caudal rays. The caudal is furcate. The pectoral is long, subfalcate, inserted close to the branchial cleft, its tip extending to the fourteenth or fifteenth scale of the lateral line, its length (22) twice that of the mandible.

The ventral is located two-fifths of the way from the snout to the base of the caudal, and directly under the middle of the dorsal.

Radial formula: D. 11 + 1 (adipose); A. 8; C. 16; P. 17 or 18; V. 9 or 10; L. lat. about 52.

Color grayish mottled with brown, scales metallic silvery.

Measurements.

Current number of specimen .....	26092	
Locality .....	Station 876-8	
	Milli- meters.	100ths of length.
Extreme length.....	112	
Length to base of middle caudal rays.....	97	100
Body:		
Greatest height.....		16
Greatest width.....		13
Height at ventrals.....		16
Least height of tail.....		8
Head:		
Greatest length.....		27
Width of interorbital area.....		2
Length of snout.....		6
Length of maxillary.....		10
Length of mandible.....		11
Diameter of orbit.....		8
Dorsal:		
Distance from snout.....		34
Length of base.....		12
Greatest height.....		19
Length of adipose fin.....		4
Anal:		
Distance from snout.....		76
Length of base.....		6
Height at longest ray.....		10
Caudal:		
Length of middle rays.....		10
Length of external rays.....		17
Pectoral:		
Distance from snout.....		16
Length.....		22
Ventral:		
Distance from snout.....		40
Length.....		18
Dorsal.....		11
Anal.....		8
Caudal.....		5, 7 + 9, 7
Ventral.....		9 or 10
Number of scales in lateral line ( <i>ca.</i> ).....		52
Number of transverse rows above lateral line.....		6½
Number of transverse rows below lateral line to ventral.....		6

NEMICHTHYIDÆ.

44. *Nemichthys scolopaceus*, Richardson.

A single specimen, No. 26106, was taken in 252 fathoms of water at station 880. It came up clinging with its long jaws to the outside of the trawl-net.

SYNAPHOBRANCHIDÆ.

45. *Synaphobranchus pinnatus* (Gronow) Günther.

Specimens were obtained from the following localities: Station 880, 252 fathoms; 881, 325 fathoms; 891, 487 fathoms; 894, 365 fathoms. In the last-mentioned locality a specimen was taken carrying nearly mature eggs.

SIMENCHELYIDÆ.

46. *Simenchelys parasiticus*, Gill.

*Simenchelys parasiticus*, GILL, in Goode & Bean, Fish. Essex Co. & Mass. Bay, 1879, p. 27.

A single specimen, No. 26172, was taken at a depth of 487 fathoms at station 892.

## RAIDÆ.

47. *Raia*, unknown species.

The young of a species of skate, with body covered closely with minute sharp spines, was taken in many localities. Mr. Garman has the specimens for identification.

48. *Raia*, unknown species.

The young of another species, with an extremely long tail, was taken from large, square, short-tendriled eggs at various depths. Mr. Garman has also these.

49. *Raia lævis*, Mitchill.

Two large skates apparently of this species were taken October 2 in deep water. A cast of one of them was made.

## SPINACIDÆ.

50. *Centrophorus*? unknown species.

Mr. Garman has for identification two specimens taken at station 893, at a depth of 372 fathoms.

## MYXINIDÆ.

51. *Myxine glutinosa*, Linnæus.

Specimens were obtained from the following localities: Stations 869, 192 fathoms; 870, 155 fathoms; 878, 142 fathoms.

**DESCRIPTION OF A NEW SPECIES OF CARANX (CARANX BEANI),  
FROM BEAUFORT, NORTH CAROLINA.**

**By DAVID S. JORDAN.**

*Caranx beani*, sp. nov.

Allied to *Caranx cibi* Poey, but much less elongate.

Color bluish above, silvery, with golden luster below; upper edge of caudal peduncle a little dusky; spinous dorsal blackish; axil dusky; no dusky spot on opercle, pectoral fin, or elsewhere.

Form rather broadly elliptic-ovate, the dorsal and ventral outlines about equally and nearly regularly curved, the depth greatest at the origin of the anal and soft dorsal, the axis of the body not far from the middle of its depth. Profile from the snout to the base of the dorsal forming a very regular curve. The greatest depth  $2\frac{2}{3}$  in total length,  $2\frac{1}{3}$  in length to the base of the caudal. Head little compressed, scarcely carinate above, the interorbital space more than half broader than the eye, which is small, shorter than snout, scarcely broader than the pre-orbital, 4 in head. Length of head  $3\frac{1}{2}$  to base of caudal, 4 in total length. Mouth comparatively small, oblique, the lower jaw very slightly projecting when the mouth is closed. Maxillary small, scarcely extending to the anterior border of the orbit. Premaxillaries anteriorly on the