

Measurements—Continued.

	Millimeters.	Millimeters.
Dorsal (spinous) :		
Distance from snout	82	300
Length of base	45	165
Length of first spine	6	9
Length of second spine	11	28
Length of longest spine (4th)	30	82+
Length of last spine	8	15
Distance between dorsals	2	17
Dorsal (soft) :		
Length of base	37	140
Length of antecedent spine	18	30
Length of longest ray	29	97
Length of last ray	13	46
Anal :		
Distance from snout	141	575
Length of base	29	91
Length of first spine	6	11
Length of second spine	12	21
Length of third spine	17	30
Length of first ray	28	87
Length of longest ray	28	87
Length of last ray	13	42
Caudal :		
Length of middle rays from origin	32	106
Length of external rays	44	132
Pectoral :		
Distance from snout	61	215
Length	33	119
Ventral :		
Distance from snout	73	285
Length	34	127
Dorsal	IX-I, 12	IX-I, 12
Anal	III, 11	III, 11
Pectoral		18
Ventral		I, 5
Number of scales in lateral line	68	69
Number of transverse rows above lateral line	10	10
Number of transverse rows from anal origin to lateral line	14	14
Number of gill-rakers	14	12

NOTES ON SOME GREENLAND FISHES.

By H. G. DRESEL,

Ensign, United States Navy.

During the months of July and August, 1883, while attached to the United States steamship *Yantic* which accompanied the Greely relief steamer *Proteus* to Greenland, I was enabled to obtain several species of the fishes inhabiting the waters of that region. I have increased the list by the examination of a collection of fishes obtained in Davis Straits by Mr. N. P. Scudder in the summer of 1879.

Sixteen species are mentioned in this paper, and comparatively full notes have been made upon them. Those of especial interest are *Icelus hamatus*, and *Salvelinus stagnalis*, full descriptions of which are given. They all form part of the National Museum collection, and the numbers accompanying them are those of the Museum Register.

Hippoglossus vulgaris Fleming.

Pleuronectes hippoglossus, LINNÉ, Syst. Nat., i, 1766, p. 456.

Hippoglossus vulgaris FLEMING, Brit. Anim., 1828, p. 197; GÜNTHER, Cat. Fish. Brit. Mus., iv, 1862, p. 403.

A skin, No. 28626, was obtained by Mr. N. P. Scudder in Davis Straits July 12, 1879. The fish was caught in a depth of 50 or 60 fathoms. The

color in spirits is a uniform dark brown, with numerous pale round spots and blotches on the body and the fins. Blind side white.

D. 102; A. 81; Gill-rakers, 8.

Towards the latter part of August the catch of the halibut began at Godhavn. The natives ventured far out into the bay in their kayaks to fish for them in deep water.

When a large fish is caught it is cut up into conveniently-sized pieces for stowage in the kayak. At one time a party of kayakers returning from Christianshaab, about 30 miles from Godhavn, brought with them pieces of halibut, to judge from which the fish itself must have weighed as much as 80 or 100 pounds.

Boreogadus saida (Lepech.) Bean.

Gadus saida LEPECHIN, Nov. Comm. Ac. Scien. Petrop., 1774, p. 512; GÜNTHER Cat. Fish. Brit. Mus., iv, 1862, p. 337; COLLETT, Den norske Nordh.-Exped., Fiske, 1880, p. 126, pl. iv, fig. 33.

Gadus fabricii RICHARDSON, F. B. A., 1836, p. 245; GÜNTHER, *op. cit.*, iv, 1862, p. 335.

Boreogadus saida BEAN, Bull. U. S. Nat. Mus., xv, p. 108.

34185. Two young specimens 110 to 122 millimeters long were picked up on the shore of the Waigatt channel, Disco Island, August 26, 1883.

In these small examples the lower jaw projects beyond the upper by 2 millimeters and the inequality of the caudal lobes mentioned by Dr. Theo. Gill, Proc. Acad. Nat. Sci. Phila., 1863, p. 233, is scarcely noticeable. The length of the head is contained $3\frac{5}{6}$ times, and the greatest depth of the body $6\frac{1}{2}$ times in the length to the caudal base. The eye is as long as the snout, $3\frac{3}{4}$ times in the length of the head. The maxilla reaches to below the middle of the eye, and is two-fifths as long as the head. The length of the mandible is contained $1\frac{3}{4}$ times, that of the interorbital width 4 times, that of the pectoral fin $1\frac{1}{3}$ times, and that of the ventral fin $1\frac{1}{2}$ times in the length of the head. The back is yellowish-brown, with a bluish tinge; the belly is silvery white. The head, body, and fins are minutely dotted with black. The lips, dorsal, pectoral, and caudal fins are black, and the tips of the anal fins are dusky.

D. 12, 15, 21; A. 16 to 20, 21; Gill-rakers 9 + 30.

Gadus morrhua Linn.

Gadus morrhua LINNÉ. Syst. Nat., i, 1766, p. 436; RICHARDSON, F. B. A., iii, 1836, p. 243; GÜNTHER, Cat. Fish. Brit. Mus., iv, 1862, p. 328.

28627. Davis Straits. N. P. Scudder. Length, 17 inches.

28628. Holsteinburg, Greenland. N. P. Scudder. Length, 11 inches.

Color, olive-brown above; belly, white. In the larger example from Davis Straits the sides are marbled with yellowish, and the fins are mottled with brown and yellow; lateral line, white; fins, dusky; dorsal and anal fins, edged with white.

Measurements.

[Species, *Gadus morrhua*.]

Current number of specimens Locality	28627 Davis Straits.		28628. Holsteinburg, Greenland.		22657a Gloucester, Mass.		22657b. Gloucester, Mass.	
	Millime- ters.	100ths of length.	Millime- ters.	100ths of length.	Millime- ters.	100ths of length.	Millime- ters.	100ths of length.
Extreme length to caudal base	395	.....	250	.....	350	.....	330	.....
Length to end of middle caudal rays.....	427	.....	275	.....	384	.....	360	.....
Body:								
Least height of tail....	21	5.3	15	6	21	6	19	5.8
Head:								
Greatest length.....	109	27.6	68	27.2	98	28	96	29
Width of interorbital area	30	7.6	17	6.8	24	7	23	7
Length of snout.....	37	9.4	22	8.8	32	9.1	31	9.5
Length of barbel.....	19	4.8	12	4.8	18	5.1	18	5.5
Length of maxilla.....	45	11.4	26	10.4	37	10.6	36	11
Length of mandible....	53	13.4	33	13.2	46	13	46	14
Diameter of eye.....	19	4.8	14	5.6	18	5.2	18	5.5
Dorsal (first):								
Length of longest ray.	53	13.4	35	14	52	15	50	15.1
Pectoral:								
Length	62	15.8	38	15.2	53	15.2	50	15.1
Ventral:								
Distance from snout....	113	28.6	70	28	95	27.1	89	27
Length	53	13.4	38	15.2	45	13	47	14
Dorsal	15, 20, 19	.....	14, 19, 18	.....	14, 18, 19	.....	13, 18, 20	.....
Anal.....	20, 18	.....	21, 17	.....	19, 18	.....	20, 19	.....
Ventral.....	6	.....	6	.....	6	.....	6	.....

Gadus ogac Rich.*Gadus ogac* RICHARDSON, Faun. Bor. Amer., iii, 1836, p. 246.*Gadus ovak* REINHARDT, Vid. Selsk. Naturvid., Math. Afh., deel. vii, 1838.*Gadus ogat* KRÖYER, Voy. en Scand. et Lap., pl. 19.

34184. Godhavn, Greenland. H. G. Dresel. Length, 190 millimeters.

34387. Godhavn, Greenland. H. G. Dresel. Length, 424 millimeters.

29096 (a). Greenland. Dr. Pavy. Length, 445 millimeters.

29096 (b). Greenland. Dr. Pavy. Length, 420 millimeters.

29096 (c). Greenland. Dr. Pavy. Length, 420 millimeters.

The specific distinction of *G. ogac* from the common cod, *G. morrhua*, is based on several important characters. Those least subject to variation are as follows: In *G. ogac* (1) the caudal peduncle is more slender, (2) the eye is comparatively larger, (3) the interorbital width is greater, (4) the barbel is longer, (5) the position of the ventral fins is more advanced, and (6) the pectoral fin is longer than in *G. morrhua*.

The color is dark, blackish-brown above, lighter below, with yellowish marblings. The tips of the dorsal, anal, and caudal fins are black. The ventrals and pectorals are dark-brown or black; a dusky spot on the axil. The barbel is black.

On comparing the following table of measurements of *G. ogac* with that of *G. morrhua* the distinctions above mentioned are brought out.

Measurements.

[Species, *Gadus ogac* Rich.]

Current number of specimen Locality	29096a. Greenland.		29096b. Greenland.		21724. Greenland.		34387. Godhavn, Greenland.	
	Millimeters.	100ths of length.	Millimeters.	100ths of length.	Millimeters.	100ths of length.	Millimeters.	100ths of length.
Extreme length to caudal base.....	400	.....	390	.....	325	.....	390	.....
Length to end of middle caudal rays	445	.....	420	.....	355	.....	423	.....
Body:								
Least height of tail....	18	4½	18	4.7	14	4.4	19	4.9
Head:								
Greatest length.....	113	28¼	109	28	98	30	110	28.4
Width of interorbital area.....	35	8¾	33	8.5	29	9	33	8.5
Length of snout.....	36	9	33	8.5	30	9.2	36	9.3
Length of barbel.....	24	6	24	6.1	19	6	25	6.4
Length of maxilla.....	47	11¾	47	12	39	12	46	11.8
Length of mandible.....	59	14¾	60	15.4	47	14.5	49	15.1
Diameter of eye.....	23	5¾	22	5.7	19½	6	22	5.7
Dorsal (first):								
Length of longest ray..	58	14½	53	13.6	52	16	55	14
Pectoral:								
Length.....	73	18½	75	19.2	59	18	66	17
Ventral:								
Distance from snout...	98	24½	89	23	80	24	97	25
Length.....	51	12¾	59	15	48	14.8	55	14
Dorsal	15, 19, 17	.....	15, 18, 17	.....	14, 18, 20	.....	14, 20, 19	.....
Anal	22, 18	.....	22, 18	.....	21, 19	.....	20, 19	.....
Ventral.....	6	.....	6	.....	6	.....	6	.....

Gymnelis viridis (Fabr.) Reinhardt.

Ophidium viride FABRICIUS, Faun. Grœnl., 1780, p. 141.

Gymnelis viridis REINHARDT, Dansk. Vidensk. Selsk. Afh., vii, 1838, p. 131; GÜNTHER, Cat. Fish. Brit. Mus., iv, 1862, p. 323; KRÖYER, Poissons du Nord., Voy. en Scand. et Lap., pl. 15, a-f; COLLETT, Den norske Nordh.-Exped., Fiske, 1880, p. 123, pl. iv, fig. 32.

One small specimen, No. 28636, badly preserved, was obtained by Mr. Scudder in Davis Straits, July, 1879. Length, 100 millimeters.

In this small specimen the maxilla does not extend to the posterior margin of the eye, which is comparatively very large. Its diameter is longer than the distance from the tip of the snout to the orbit, and is contained 4 times in the length of the head. The length of the head is contained 7 times, and the greatest height of the body 12 times in the total length. The pectoral is one-half as long as the head.

D. ca 97; A. ca. 80.

Anarrichas lupus Linn.

Anarrichas lupus LINNÉ, Syst. Nat., i, 1766, p. 430; GÜNTHER, Cat. Fish. Brit. Mus., iii, 1861, p. 208.

Anarrichas vomerinus STORER, Hist. Fish. Mass., 1867, p. 99, pl. xviii, fig. 1.

No. 28631. Davis Straits. N. P. Scudder. Length, 400 millimeters; D. 74; A. 45; P. 20.

This species is readily distinguished from other species of the same genus by the arrangement of the teeth, the band on the vomer extend-

ing much farther back than the short palatine bands, and by the presence of ten or twelve vertical black bands on the sides of the body.

In the example from Davis Straits there are 5 strong canines anteriorly in the upper jaw, and 4 in the lower. The vomer has 6 strong molars in an irregular double series, and each palatine is armed with 3 similar teeth. No lateral series in the upper jaw; the lower jaw with about 9 molars in a single series on each side, and 2 or 3 inner teeth anteriorly. The length of the upper jaw is slightly greater than one-half of the length of the head.

The length of the head is contained $4\frac{2}{5}$ times, and the greatest height of the body $5\frac{1}{2}$ times in the length to base of caudal. The eye is slightly greater than the snout and less than the interorbital width, its greatest diameter being contained $5\frac{1}{2}$ times in the length of the head. The longest dorsal ray is not quite one-half the length of the head. The pectoral is large; its length is contained $1\frac{3}{5}$ times in that of head.

D. 74; A. 45; P. 20.

Ammodytes dubius Reinb.

Ammodytes dubius REINHARDT. Dansk. Vidensk. Selsk. Afhand., vii, 1833, p. 132; GÜNTHER, Cat. Fish. Brit. Mus., iv, 1862, p. 357.

A number of examples of this species were obtained by Mr. N. P. Scudder, July, 1879. They were taken from the stomach of a halibut caught in Davis Straits, near Holsteinburg, Greenland. The species is readily distinguished from *A. americanus* by the radial formula, the number of lateral folds, and the proportional length of the head.

28633 (*a*). Davis Straits. N. P. Scudder. D. 66; A. 32; lateral folds, 149. Length, 190 millimeters.

28633 (*b*). Davis Straits. N. P. Scudder. D. 65; A. 34; lateral folds ca., 150. Length, 192 millimeters.

28633 (*c*). Davis Straits. N. P. Scudder. D. 65; A. 33; lateral folds ca., 145. Length, 180 millimeters.

28633 (*d*). Davis Straits. N. P. Scudder. D. 67; A. 36; lateral folds, 152. Length, 202 millimeters.

28633 (*e*). Davis Straits. N. P. Scudder. D. 66; A. 33; lateral folds ca., 145. Length, 190 millimeters.

In all these examples the dorsal fin begins over the posterior third of the pectoral fin, which is equal in length to the postorbital part of the head and to the greatest height of the body. The length of the head is contained $5\frac{1}{2}$ to 6 times in the length to the caudal base. The diameter of the eye is one-half the length of the snout, which is about one-third the length of the head.

A young example of this species obtained in Godhavn Harbor, Disco Island, August, 1883, resembles *A. americanus* in the number of fin rays and the proportional length of the head, yet this may be owing to the incomplete development in the young fish. A distinctive feature is the number of body folds. As many as 155 can be plainly counted,

while in the largest specimen of *A. americanus* examined the number does not exceed 130. The pectoral fin also is larger.

The color is olivaceous above, lighter below, a bluish-silvery stripe on the sides. The head is brownish, with a dark-brown blotch on the preorbital, and a black streak across the opercle on line with the eye. The mandibular symphysis is black, and the opercular margin is punctulated with black. There is a blackish blotch on the caudal peduncle; caudal fin and upper half of pectoral fin dusky.

***Stichæus punctatus* (Fabr.) Kröyer.**

Blennius punctatus FABRICIUS, Faun. Grœnl., 1780, p. 153.

Stichæus punctatus KRÖYER, Nat. Tids. I, 377, and Plates Poissons du Nord, Voy. en Scand. et Lap., pl. 20, fig. 2, a-c; GÜNTHER, Cat. Fish, Brit. Mus., iii, 1861, p. 283.

Two examples of this species, 126 and 127 millimeters in length, were obtained with a boat dredge at Godhavn, Disco Island, July 15, 1883.

The body is moderately elongate, compressed, and covered with small scales. The lateral line is single, well up on the back, extending slightly beyond the middle of the dorsal fin. The gill-openings are continued forward below, the membranes united to the narrow isthmus. The snout is subconical, as long as the eye, which is large and prominent, its greatest diameter being contained $4\frac{1}{2}$ times in the length of the head. The maxilla reaches slightly beyond the vertical through the anterior margin of the eye, and its length is contained 4 times in that of the head. The length of the mandible is three-sevenths of that of the head. The width of the interorbital space is one-half of the greatest diameter of the eye. The dorsal fin is long, of spines only; the anal is shorter, with a short antecedent spine. The caudal fin is rounded. The pectoral is well developed, not quite as long as the head. The ventral fin is composed of three rays, its length being two-fifths of that of the head. The length of the head is contained $4\frac{1}{2}$ times, and the greatest depth of the body $7\frac{3}{4}$ times in the total length of the caudal base.

The color is a bright scarlet; the head is marked below with 5 or 6 brown reticulations, and with a brown streak from the snout to the eye. The vertical fins and the pectorals are marked with brown bands. The dorsal fin has 5 large round black spots, each with a white band near its posterior margin. These spots are placed at equal intervals on the fin.

D. XLIX; A. I, 35; P. 16; V. 3; B. 6.

***Eumicrotremus spinosus* (Müll.) Gill.**

Cyclopterus spinosus MÜLLER, Prodr. Zool. Dan., ix, 1877; FABRICIUS, Faun. Grœnl., 1780, p. 134; KRÖYER, Poissons du Nord, Voy. en Scand. et Lap., pl. 4, fig. 2, a-c.; GÜNTHER, Cat. Fish, Brit. Mus., iii, 1861, p. 157.

Eumicrotremus spinosus GILL, Proc. Acad. Nat. Sci. Phila., 1864, p. 190; COLLETT, Zool. norske Nordh.-Exped., Fiske, 1880, p. 47, pl. ii, fig. 13.

28632. A single specimen, 90 millimeters long, was obtained by Mr. Scudder in Davis Straits, July, 1879. It was taken from the stomach of a halibut.

The head and body suborbicular; the body posteriorly is abruptly compressed. The mouth is moderate, the jaws with narrow bands of villiform teeth. The maxilla reaches to below the anterior margin of the eye, its length being contained $2\frac{1}{3}$ times in that of the head. The gill opening is small, as long as the diameter of the eye, which is contained 3 times in the length of the head. The disc is about as long as it is broad, two-thirds of the length of the head. The interorbital width is greater than one-half the length of the head, and not quite twice the diameter of the eye. Length of head contained 3 times, greatest height of body 2 times, in total length. The body is covered with conical plates of various sizes, those of the pectoral region being the largest, about as large as the eye. The plates are studded with small tubercles, and the larger ones have the centers elevated and pointed.

Color, in spirits, light brown, with traces of punctulations on the skin between the plates.

D. VII, 11; A. ca. 10.

Cyclopterus lumpus L.

Cyclopterus lumpus LINNÉ, i, 1766, p. 414; GÜNTHER, Cat. Fish, Brit. Mus., iii, 1861, p. 155.

No. 28637 is a small example of this species obtained by Mr. Seudder in Davis Straits. It is only 31 millimeters long. The spinous dorsal is comparatively high and is not enveloped in thick skin as in the adults. The abdominal tubercles are the most developed. The gill-opening is as long as the base of the anal fin, which is as long as the disc. D. iv, 10; A. 10.

Only one specimen, badly mutilated by the Esquimaux dogs, was seen at Godhavn. The color was a bright olive green, with the belly white. These fish are seldom caught in this harbor after May, during which month they are very abundant.

Cottus scorpius L., subsp. grœnlandicus C. & V.

Cottus grœnlandicus CUV. & VAL., Hist. Nat. Poiss., IV, 1829, p. 185; GÜNTHER, Cat. Fish, Brit. Mus., II, 1860, p. 161.

Cottus scorpius subsp. *grœnlandicus*, BEAN, Bull. U. S. Nat. Mus., XV., p. 118.

34386 (a). ♂ Godhavn, Greenland. H. G. Dresel. D. X, 17; A. 14. Length, 268 millimeters. Interorbital width equal to diameter of eye. Longest dorsal spine contained 6 times, and longest dorsal ray 5 times, in length to caudal base.

34386 (b). ♀ Godhavn, Greenland. H. G. Dresel. D. X, 16; A. 13. Length 254 millimeters. Interorbital width is equal to diameter of eye. Longest dorsal spine contained 8 times, longest dorsal ray 6 times, in the total length to caudal base.

34386 (c). ♂ Godhavn, Greenland. H. G. Dresel. D. XI, 16; A. 12. Length, 245 millimeters. Interorbital width contained $1\frac{1}{6}$ times in diameter of eye. Longest dorsal spine contained $6\frac{1}{2}$ times, longest dorsal ray 6 times, in the length to caudal base.

34386 (*d*). ♂ Godhavn, Greenland. H. G. Dresel. D. XI, 17; A. 14. Length, 252 millimeters. Interorbital width equals diameter of eye. Longest dorsal spine contained 7 times, and longest dorsal ray 6 times, in total length to caudal base.

34386 (*e*). ♂ Godhavn, Greenland. H. G. Dresel. D. X, 16; A. 13. Length, 161 millimeters. Interorbital width contained $1\frac{1}{2}$ times in diameter of eye. Longest dorsal spine contained $5\frac{3}{4}$ times, and longest dorsal ray $5\frac{1}{5}$ times, in total length to caudal base.

In all the examples examined the length of the head is contained $2\frac{1}{2}$ to $2\frac{3}{4}$ times in the total length, and the greatest height of the body about $4\frac{1}{2}$ times. The greatest diameter of the eye is one-sixth of the length of the head.

The subspecies *grænlandicus* differs from *Cottus scorpius* (1) in its larger size; (2) in the greater interorbital width which in *C. scorpius* seldom exceeds five-eighths of the longest diameter of the eye; and (3) in the higher spinous dorsal, the longest dorsal spine in *C. grænlandicus* being contained 5 to 6 times in the total length to the caudal base, while in *C. scorpius* it is contained as much as 7 to 8 times in the same length.

The natives catch these sculpins in large numbers for their food supply. They use 6 or 7 fathoms of line with a 3- or 4-pronged hook and no bait.

Gymnacanthus tricuspis (Reinh). Gill.

Cottus tricuspis REINHARDT, Vidensk. Selsk. Nat. Math. Afh., V, p. LII; GÜNTHER, Cat. Fish, Brit. Mus., II, 1860, p. 168.

Phobctor tricuspis, KRÖYER, Natur. Tidskr. I, 1844, p. 263.

Gymnacanthus tricuspis, GILL, Cat. Fish. E. Coast N. A., 1873, p. 22.

Gymnacanthus pistilliger, COLLETT, Den norske Nordh.-Exped., Fiske, 1880, p. 26.

28629 (*a*). Holsteinburg, Greenland. N. P. Scudder. ♂ D. XII, 16; A. 18.

28629 (*b*). Holsteinburg, Greenland. N. P. Scudder. ♂ D. XII, 16; A. 17.

28629 (*c*). Holsteinburg, Greenland. N. P. Scudder. ♀ D. XI, 16; A. 17.

34388. Godhavn, Greenland. H. G. Dresel. ♂ D. XI, 15; A. 17.

These examples, as well as those collected in Cumberland Gulf and Disco Bay by Mr. Kumlien in the summer of 1878, all differ decidedly from the west coast specimens in the museum collection.

Dr. T. H. Bean having examined Pallas's type of *Cottus pistilliger* from Kamtschatka and compared numerous specimens from the Pacific and Atlantic Oceans, inclines to the belief that the Greenland form of *Gymnacanthus* does not occur in the Pacific. It is best, therefore, to retain Reinhardt's name *tricuspis* for the Atlantic species.

The skin is smooth with a patch of rough, scale-like tubercles in the pectoral region of the body, partly concealed by the pectoral fin. The lateral line, with 38 to 42 tubes, is curved under the last dorsal ray.

The mouth is moderate; the maxilla reaches to below the middle of the eye, and its length is one-half of the greatest height of the body. The eye is large, its greatest diameter being contained four times in the length of the head. The interorbital area is narrow, deeply concave; its greatest width is one-third of the diameter of the eye. The nasal spines are small. The upper preopercular spine has 3 small spinous processes; its greatest length is about two-thirds of the diameter of the eye. In the male example from Godhavn there is a patch of 8 or 9 rough plates between the occipital ridges. These are entirely wanting in the two male examples from Holsteinburg Harbor, while in the female the top of the head, the nape, and the upper parts of the opercles are thickly covered with these plates. Another noticeable difference between the sexes is in the height of the dorsal fins and in the length of the ventrals. The dorsal fin in the male is comparatively much higher than in the female, the longest dorsal spine in the former being as long as the head, while in the latter it is only three-fifths of the length of the head. The ventral in the male reaches beyond the origin of the anal fin, its length being one-third of the total length to the base of the caudal fin, while in the female the ventral does not reach the vent, its length being one-fourth of the total length to caudal base. The pectoral fin is about as long as the head, and the middle pectoral rays are papillose on their inner edges. The ventral rays are exerted. The color is dark brown above. The thoracic region is dusky, with irregular large yellow spots. On the side of the tail is a series of four or five white spots smaller than the eye. The chin is banded with yellow and brown. The spinous dorsal is black, with two rows of white spots on the basal half of the fin. The soft dorsal is black, with five or six broad oblique white bands. Pectoral yellowish, with four or five transverse series of black spots. Ventrals spotted with black and white; caudal fin dusky; anal colorless.

D. XII, 15-16; A. 17-18; P. 19; V. I, 3; Pyloric cœca 6.

Icelus hamatus Krøyer.

Icelus hamatus KRØYER, Nat. Tidsskr., I, 1844, p. 253, and Poissons du Nord, Voy. en Scan. et Lap., pl. I, fig. 2, a-g; GÜNTHER, Cat. Fish, Brit. Mus., II, 1862, p. 172; COLLETT, Den norske Nordh.-Exped., Fiske, 1880, p. 34, pl. I, fig. 8.

A fine example, 6 inches long, of this species, No. 28630 in the National Museum collection, was obtained in Davis Straits by Mr. N. P. Scudder. Owing to the scarcity of this species in collections and the good condition of the example under consideration I have thought it best to give a full description.

The body is fusiform, with the abdominal outline nearly straight; the greatest height of the body at the origin of the spinous dorsal fin is one-fourth of the total length to the caudal base. The caudal peduncle is slender, the least height of the tail being only one-fifth of the greatest height of the body. The head is large and naked, its length being contained $2\frac{2}{3}$ times in the total length to caudal base. The nu-

chal region has a cross ridge, in front of which is a quadrate depression. The occiput is armed with a pair of blunt spines, the length of a spine being two-fifths of the greatest diameter of the eye. At the base of each spine is a blunt protuberance. The preopercle is armed with four spines, the upper of which is the longest, bifurcate, and hooked upwards; the one next below is slightly bent upward, and the remaining two are directed downward and forward. The suborbital stay is prominent. The eye is large, placed next to the upper profile of the head; its greatest diameter is equal to the length of the snout, and is one-fourth of the length of the head. The interorbital area is very narrow and concave, its width being one-fourth of the greatest diameter of the eye. The maxilla extends slightly beyond the vertical through the posterior margin of the eye, and its length is contained 2 times in the length of the head. The teeth are in villiform bands on the jaws, vomer, and palatines. The body is chiefly naked, with a dorsal series of 23 bony, scale-like plates beginning opposite the sixth dorsal spine and extending upon the upper side of the caudal peduncle; a second series of 41 similar plates along the lateral line. There are 2 or 3 of these plates on either side of the nape, behind the occipital spines, and a patch of 4 or 5 plates below the lateral line in the pectoral region.

The spinous dorsal begins over the tip of the opercular flap, and the length of its base is equal to that of the upper jaw. It is composed of 9 slender and flexible spines, the longest spine being as long as the distance from the tip of the snout to the orbit. The soft dorsal, of 20 rays, begins halfway between the tip of the snout and the base of the caudal fin. Its base is nearly as long as the head, and the longest ray is one-third the length of its base. The origin of the anal fin is under the third dorsal ray; the length of its base is equal to the greatest height of the body, and the longest ray is as long as the longest dorsal spine. The caudal fin is rounded, the middle rays being as long as the maxilla. The length of the pectoral base is two-fifths of that of the head, and the longest pectoral ray is equal in length to the greatest height of the body. The ventral fin is composed of 1 spine and 3 rays, its length being two-fifths of that of head.

There are no gill-rakers, but the anterior gill-arch bears 9 or 10 low tubercles.

Color in spirits, a light olive-brown above; yellowish below; belly white. A large dark-brown blotch, marked with white, extends from the base of the spinous dorsal down upon the side to the base of the pectoral fin, being darkest just behind the opercular flap. A second similar but narrower blotch on the back from the seventh to the tenth dorsal rays extends obliquely down and forward to below the lateral line. A third faint blotch on the back at the end of the soft dorsal. In addition there are numerous smaller spots and blotches along the lateral line, and a triangular spot on the caudal peduncle at the caudal base. Cheeks brown, marbled with yellow. Dorsal, caudal, and pec-

toral fins with narrow black transverse bands. A dark spot on the pectoral fin near its base. Anal and ventrals colorless.

D. 1X, 20; A. 16; P. 18; V. I, 3; l. lat. 41.

Table of measurements.

[Species: *Icelus hamatus* Kröyer.]

Current number of specimen..... Locality.....	28630. Davis Straits.	
	Millime- ters.	100ths of length.
Extreme length to end of middle caudal rays.....	157	.....
Length to origin of middle caudal rays.....	134	.....
Body:		
Greatest height.....	35	26
Greatest width.....	27	20
Height at ventrals.....	34	25.4
Least height of tail.....	7	5.3
Length of caudal peduncle (from end of dorsal).....	21	15.8
Head:		
Greatest length to end of opercular flap.....	50	37.3
Distance from snout to nape.....	39	29
Greatest width.....	28	21
Width of interorbital area.....	3	2 $\frac{1}{4}$
Length of snout.....	13	9.7
Length of longest preopercular spine.....	5	3.7
Length of maxilla.....	23	17.2
Length of upper jaw.....	26	19.4
Length of mandible.....	28	21
Distance from snout to orbit.....	15	11.2
Diameter of orbit.....	13	9.7
Dorsal (spinous):		
Distance from snout.....	49	36.6
Length of base.....	26	19.4
Length of longest spine (3d).....	15	11.2
Length of first spine.....	13	9.7
Length of second spine.....	14	10.6
Length of last spine.....	2	1 $\frac{1}{2}$
Dorsal (soft):		
Length of base.....	48	36
Length of longest ray.....	16	9
Length of last ray.....	7	5.3
Anal:		
Distance from snout.....	74	55.2
Length of base.....	35	26
Length of first ray.....	7	5.3
Length of longest ray.....	15	11.2
Length of last ray.....	6	4.5
Caudal:		
Length of middle rays.....	23	17.2
Length of external rays.....	16	9
Pectoral:		
Distance from snout.....	45	34
Length (of longest ray.).....	35	26
Ventral:		
Distance from snout.....	39	29
Length.....	21	15.8
Branchiostegals.....	VI	.....
Dorsal.....	IX-20	.....
Anal.....	16	.....
Caudal.....	14	.....
Pectoral.....	18	.....
Ventral.....	I, 3	.....
Number of plates in lateral line.....	41	.....

Sebastes marinus (L.) Lütken.

Perca marina, LINNÉ. Syst. Nat., i, 1766, p. 483.

Perca norvegica, MÜLLER, Zool. Dan., p. 46.

Sebastes norvegicus, CUV. & VAL., Hist. Nat. Poiss, iv, 1829, p. 327, pl. 87; GÜNTHER, Cat. Fish Brit. Mus., ii, 1860, p. 95.

Sebastes marinus, COLLETT, Den norske Nordh.-Exped., Fiske, 1880, p. 15 pl. II, figs. 3-4.

28635. juv. Two very small specimens were obtained in Davis Straits by Mr. N. P. Scudder in the summer of 1879. The color in spirits is a

pale yellowish-brown with three or four large brown blotches on the back extending partly on the dorsal fin.

D. XIII, 14; A. III, 7.

Mallotus villosus (Müll.) Cuv.

Clupea villosa, MÜLLER, Prod. Zool. Dan., 1777, p. 245.

Mallotus villosus, GÜNTHER, Cat. Fish. Brit. Mus., vi, 1866, p. 170; RICHARDSON, F. B. A., iii, 1836, p. 187.

34385. Eight examples of this species, 7 males and 1 female, were obtained at Godhavn, Greenland. The males are all conspicuous by the presence of the large lanceolate lateral scales, and the compressed base of the anal fin. The length of the head is contained $4\frac{1}{2}$ to $4\frac{2}{3}$ times the depth, 6 to $7\frac{1}{2}$ times in the total length to the origin of the caudal fin. The snout is contained $3\frac{1}{2}$ times, and the greatest diameter of the eye 4 to $4\frac{1}{2}$ times in the length of the head.

D. 13-14; A. 20-22; P. 20.

The capelin are caught in numbers by the natives and dried, forming part of the winter's supply of food.

8. Salvelinus stagnalis (Fabr.) Gill & Jor.

Salmo stagnalis FABRICIUS, Fanna Grœnlandica, 1780, p. 175.

Salmo alipes RICHARDSON, Fauna Bor. America, 1836, p. 169, pl. 81 and 86, fig. 1.

Salmo alipes GÜNTHER, Cat. Fish. Brit. Mus., vi, 1866, p. 149.

Salvelinus stagnalis JORDAN & GILBERT, Synop. Fish. N. A., 1883, p. 321.

34384. In July, 1883, three specimens of the genus *Salvelinus*, two males and one female, were obtained from the native Esquimaux at the settlement of Godhavn, Disco Island, in Western Greenland. The fish were caught at the mouth of a mountain stream emptying into the sea near the settlement. They vary in total length from 15 to 17 inches.

Although it is doubtful whether this species is the *Salmo stagnalis* of Fabricius, yet it agrees partly with his description and very closely with Dr. Richardson's description of *Salmo alipes*, which is probably identical with *S. stagnalis*. It differs from *S. carpio* Fabricius in being more elongate and in the absence of the black quadrate spots mentioned in his description.

The examples under consideration were compared with notes on the types of *Salmo naresi* Günther, made by Dr. Tarleton H. Bean, in the British Museum, and the most prominent points of difference noticed were the following: In *S. naresi* (1) the eye is very much larger, (2) the snout is much shorter, (3) the maxilla does not extend beyond the posterior margin of the eye, (4) the gill-rakers are longer and more numerous. In other respects the resemblance between the two species is close.

Salmo stagnalis is described in Fauna Grœnlandica, 1780, p. 175, as follows:

“A salmon of a brownish color above, pale below; body subterete, the upper jaw the longer. The Greenland name is *Ekallukak*.

“*Description*.—B. 12; D. 14; P. 14; V. 10; A. 10; C. 21. Length, $17\frac{1}{2}$ inches. This is much larger than the preceding species [*S. alpinus*]. The body is somewhat rounded and elongate, becoming very slender behind the vent towards the extremity of the tail, where it expands slightly above and below into the caudal fin, of which the base is more compressed. Head large, oblong, ovate with flat sides, crown prominent, snout somewhat pointed; nostrils two on each side in front of eyes, their openings contiguous, wide; the anterior is the smaller, circular, the posterior larger, almost triangular; opercles large, smooth, and double, as in the preceding species; upper jaw longer than the lower; the snout projecting by 2 lines. Both jaws with toothed margins; the upper is also toothed on the posterior part which extends beyond the lower jaw. Palate with two rows of closely-placed teeth, to which is added a third but short intermediate row anteriorly; tongue long, somewhat obtuse, the margins with about twenty or more teeth. Teeth all strong, curved, and sharp. The first dorsal begins slightly in advance of the ventrals; rays 2 inches long and almost equal in length; the posterior adipose fin placed behind the anal, short, falcate, with rounded apex. The pectoral fins are slightly longer than the dorsal, pointed; the three upper rays of increased length, the remaining ones gradually becoming shorter. Ventrals similar to the pectorals, but slightly shorter, placed half-way between the gills and the adipose fin. Anal fin terminates opposite the adipose fin; shorter than the others, the rays becoming gradually shorter posteriorly; caudal fin large, sub-bifurcate. Color above and of dorsal fins brownish-black; sides pale, white below. All the lower fins grayish-white, with white bases. Flesh pale. I could observe no spots.

This second specimen was in a dried state; it was not possible to obtain a live example.”

The specimens under examination have the body elongate, not much compressed, caudal peduncle slender. The head is moderate, slightly raised mesially; the interorbital space broad, its width contained about 3 times in the length of the head; the snout is pointed, its length contained about 4 times in that of the head. The jaws are subequal; the maxillary, long and narrow, extends beyond the vertical through posterior margin of eye, and seems to be somewhat shorter in the female than in the males. Eye rather small, its diameter being contained $6\frac{3}{4}$ to 7 times in the length of the head. The nostrils are close together in the horizontal through the upper margin of the eye and at a distance from the center of the pupil equal to their distance from the tip of the snout. The anterior nostril with a circular flap, the posterior triangular.

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Teeth in a single series on the jaws, palatines, and on the margin of the tongue; 3 or 4 strong teeth on the chevron of the vomer. The hyoid teeth are well developed. The preorbital is narrow, its width being about one-fourth of the diameter of the eye, with a row of conspicuous pores. Preopercle with a lower limb. The broad opercles and preopercles are conspicuously striated, and the postorbitals and suboperculum have strong concentric striæ. The gill-rakers are short and wide, the longest being one-half as long as the eye; there are 9 above and 14 to 15 below the angle of the anterior arch. The dorsal fin is about as high as long, the longest ray being contained $1\frac{3}{4}$ times in the length of the head. The anal fin is short, its longest ray slightly longer than the base of the fin is contained 2 times in the length of the head. The adipose fin is placed above the last anal rays; it is of moderate length, falcate, its height being about twice its width. The pectoral fin is placed low; its length is less than one-half the distance of its origin from that of the ventral. The ventral is inserted under the fourth dorsal ray and reaches half-way to the anal origin. The length of the ventral appendage is two-fifths of that of the fin. The caudal fin is large, slightly forked, the external rays not quite twice as long as the middle rays. All the fins are shorter in the female than in the male.

The length of the head is contained $4\frac{3}{5}$ to 5 times, and the greatest height of the body $5\frac{1}{4}$ to 6 times in the total length from the tip of the snout to the end of the scales. The diameter of the eye is contained 2 times in the distance from the orbit to the tip of the snout, and $2\frac{1}{3}$ times in the width of the interorbital area. The length of the snout is one-fourth, that of the maxilla two-fifths, that of the pectoral two-thirds, and that of the ventral about one-half of the length of the head.

The scales are small. There are about 235 in a longitudinal series above the lateral line, which is composed of about 123 larger tube-bearing scales. There are about 34 scales in a transverse series above the lateral line, and 26 to 30 below.

Radial formula.—D. iii—iv, 11; A. ii, 10; P. 14; V. i, 9; B. 11; gill-rakers 9 + 14 to 15; pyloric cœca, 30 to 35.

The color is dark green on the head and the upper part of the body, with lighter wide irregular green streaks, differing in width, length, and position in different individuals; silvery below. The sides are everywhere covered with pale pink spots, the largest not as large as the eye. These spots almost disappear in the alcoholic specimens. The dorsal fin is bluish-green, somewhat lighter towards its base. The caudal lobes are dusky near the margins. The other fins are reddish or pink. The flesh is pale pink.

Table of measurements.

[Species, *Salvelinas stagnalis* (Fabr.) Gill.]

Current number of specimen..... Locality.....	34384 (5) ♂ Disco Island, Greenland.		38384 (6) Disco Island, Greenland.		34384 (7) Disco Island, Greenland.	
	Milli- meters.	100ths of length.	Milli- meters.	100ths of length.	Milli- meters.	100ths of length.
Extreme length.....	380	.....	398	.....	429	.....
Length to end of scales.....	353	.....	372	.....	400	.....
Body:						
Greatest height.....	65	18.5	71	19.1	68	17
Greatest width.....	31	9	39	10.5	38	9.5
Height at ventrals.....	62	17½	68	18.3	65	16½
Least height of tail.....	24	6.9	26	7	24	6
Length of caudal peduncle.....	57	16½	62	16.6	58	14.6
Head:						
Greatest length.....	74	21	75	20½	87	21.8
Longest gill-raker.....	4½	1.5	6	1.6	6	1.5
Greatest width.....	30	8.5	36	9.7	40	10
Width of interorbital area.....	25	7	26	7	29+	7.3
Length of snout.....	19	5.5	19	5.2	22	5.5
Length of operculum.....	22	6.3	24	6.5	32	8
Length of maxillary.....	30	8.5	28	7.6	34½	8.6
Length of upper jaw.....	38	10.8	36	9.7	44	11
Length of mandible.....	45	12.7	45	12.3	54	13.5
Distance from snout to orbit.....	21½	6	22	5.8	25	6½
Diameter of eye.....	11	3.1	11½	3.1	12½	3.1
Diameter of iris.....	9	2.5	9	2.4	9½	2.4
Dorsal:						
Distance from snout.....	155	44	174	46.8	180	45
Length of base.....	44	12.6	42	11.5	44	11
Length of longest ray.....	44	12.6	44	12	40	12½
Length of last ray.....	21	6	18	4.8	22	5.5
Adipose fin:						
Distance from origin of rayed dorsal.....	122	34	139	37	132	33
Length of base.....	9	2.5	6	1.6	9	2
Length of posterior margin.....	13	3½	9	2.4	12½	3.1
Anal:						
Distance from snout.....	257	73	268	72	292	73
Length of base.....	35	10	33	9	37	9½
Length of longest ray.....	37	10.6	38	10.3	42	10.5
Length of last ray.....	14	4	13½	3.7	15½	3.8
Caudal:						
Length of middle rays from end of scales.....	27	7.6	26	7	29	7.3
Length of external rays from end of scales.....	51	14.5	53	14.5	55	13.8
Pectoral:						
Distance from snout.....	73	20.7	74	20	83	20.8
Length.....	50	14.2	47	12.7	54	13.5
Ventral:						
Distance from snout.....	184	52.3	183	49.2	198	49.5
Length.....	43	12½	41	11	46	11.5
Length of appendage.....	17	4.8	18	4.8	18½	4.6
Branchiostegals.....	11, 10	.....	11	.....	11	.....
Dorsal.....	iv, 11	.....	iii, 11	.....	iii, 11	.....
Anal.....	ii, 10	.....	ii, 10	.....	ii, 10	.....
Pectoral.....	13	.....	14	.....	14	.....
Ventral.....	i, 8	.....	i, 9	.....	i, 9	.....
Number of scales in lateral line tube bearing.....	ca. 120	.....	ca. 123	.....	ca. 128	.....
Number of scales in longitudinal series.....	ca. 235	.....	ca. 235	.....	ca. 235	.....
Number of transverse rows above lateral line.....	ca. 34	.....	ca. 35	.....	ca. 34	.....
Number of transverse rows below lateral line.....	ca. 26	.....	ca. 30	.....	ca. 26	.....
Number of gill-rakers.....	9+15	.....	9+14	.....	9+14	.....
Number of caecal appendages.....	30	.....	35	.....	34	.....