

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE
COMMANDER ISLANDS.

XII.—FISHES COLLECTED AT BERING AND COPPER ISLANDS BY NIKOLAI
A. GREBNITSKI AND LEONHARD STEJNEGER.

By TARLETON H. BEAN, M. D., M. S.,
Honorary Curator of the Department of Fishes,

and

BARTON A. BEAN,
Assistant Curator of the Department of Fishes.

THE COLLECTIONS here catalogued were obtained partly by Dr. Stejneger during his stay on the Commander Islands in 1882-83, and partly by Mr. Grebnitski from 1883 to 1885. The number of species is 45. Most of them were picked up on the beaches between tides; fishes from deeper waters were occasionally taken from stomachs of cod and wolf fish. No appliances for dredging or trawling were available, hence the fish fauna was by no means exhausted.

Notwithstanding the unfavorable conditions for making a collection, there are several very interesting species, as, for example, *Aspidophoroides monopterygius*, *Gasterosteus brachypoda*, *Gymnelis viridis*, and *Liparis tunicata*, forms belonging to western Atlantic and Greenland waters; the little known *Cottus axillaris* and *Cyclopterichthys ventricosus* are also represented. Doubtless, as Dr. Stejneger remarks, "a systematic search would add many species," but meanwhile the forms here mentioned will have an important bearing upon the zoological relations of the Commander Islands to the mainland of Asia and Alaska.

A series of specimens of *Anoplarehus* from Puget Sound, Washington, is introduced to show the variability of the squamation in one of its species.

SQUALUS ACANTHIAS, Linnæus.

A specimen was preserved in salt by Dr. Stejneger.

SALVELINUS MALMA (Walbaum), Jordan and Gilbert.

No. 33832, U.S.N.M. (1560). Bering Island, September 9, 1882; L. Stejneger. "Goletz" of the natives, according to the collector's notes.

No. 33836, U.S.N.M. (1561). Bering Island, September 9, 1882; L. Stejneger.

No. 33851, U.S.N.M. (2340). Copper Island, village creek, spring, 1883; L. Stejneger. "*Golets*" of the natives. Young, 5 inches long.

No. 33820, U.S.N.M. (2510). Bering Island, 1883; L. Stejneger.

No. 38999, U.S.N.M. Bering Island, December, 1884; N. Grebnitski. Four examples.

ONCORHYNCHUS GORBUSCHA (Walbaum), Gill and Jordan.

No. 33862, U.S.N.M. (1417*a*). Young. Bering Island, August 11, 1882; L. Stejneger.

No. 33865, U.S.N.M. (2417). Young; L. Stejneger.

Concerning the first, Dr. Stejneger gives the following: "Silvery; green with small black spots on the back. Was given by the natives as undoubted *Baidarsik*. The Aleutian name was said to be *Tukukh*, or, in order to distinguish it from No. 1485, *Tchihanakh Tukukh*, that is, river *Tukukh*."

No. 1485 of Dr. Stejneger is the *Alagon Tukukh* of the Aleuts, *Morskoi Okun* of the Russians.

ONCORHYNCHUS KISUTCH (Walbaum), Jordan and Gilbert.

No. 33818, U.S.N.M. (2511). Male. Bering Island, spring, 1883; L. Stejneger. Anal rays developed, 14; branchiostegals, 13; gill rakers, 21+; pyloric cœca few; lateral line, 130.

No. 33830, U.S.N.M. (1554). Male, juvenile. Bering Island, September 9, 1882; L. Stejneger. Anal, 14; branchiostegals, 13; gill rakers, 20+; cœca few; lateral line, 133.

No. 33831, U.S.N.M. (1555). Male, juvenile. Bering Island, September 9, 1882; L. Stejneger.

No. 33827, U.S.N.M. (2512). Male, adult. Bering Island, May 10, 1882; L. Stejneger.

No. 33838, U.S.N.M. Female, juvenile. Bering Island, September 9, 1882; L. Stejneger.

No. 39001, U.S.N.M. Juvenile. N. Grebnitski. Two specimens.

ONCORHYNCHUS NERKA (Walbaum), Gill and Jordan.

No. 39000, U.S.N.M. Bering Island, December, 1884, N. Grebnitski. Five young individuals. B. 13; A. 15; scales, 133; gill rakers, 14+19; cœca few.

MALLOTUS VILLOSUS (Müller), Cuvier.

No. 33876, U.S.N.M. (2188). Bering Island, June 19, 1883; L. Stejneger.

No. 47560, U.S.N.M. Bering Island; L. Stejneger. Three specimens, two males and one female. The female 6½ inches and the males 6 inches long.

HEXAGRAMMUS ORDINATUS, Cope.

No. 38989, U.S.N.M. Bering Island, March, 1884; N. Grebnitski. Young. D. XIX, 25; A. 25; scales 90.

No. 38992, U.S.N.M. Bering Island, September, 1884; N. Grebnitski. D. XX, 24; A. 25; scales 93.

HEXAGRAMMUS ASPER, Steller.

No. 33847, U.S.N.M. (2533). Bering Island, September 1, 1882; L. Stejneger. D. XIX, 24; A. 25. L. lat. 93 (87 pores). A young specimen, 54 mm. long.

This specimen shows a most remarkable abnormality in the development of the lateral lines. The upper line on each side extends to the middle of the soft dorsal; the second line on the left side does not quite reach to below the end of the soft dorsal, while on the right side the corresponding line extends to the caudal; on the left side the line appears to start from a point nearly above the end of the ventral and extends upward and backward to about opposite the ninth ray of the anal; there is no corresponding line on the right side. The two lines running along the base of the anal, and extending to the caudal, converge in the usual way just behind the ventrals, and are continued forward in a single line to the root of the ventrals.

Gill membranes united very narrowly to the isthmus.

HEXAGRAMMUS SUPERCILIOSUS (Pallas), Jordan and Gilbert.

No. 33868, U.S.N.M. (1950). Bering Island, March 13, 1883, L. Stejneger. Length of specimen, 120 mm.; D. XXII, 22; A. 23.

The upper lateral line extends to below the end of the second dorsal; the second line to the upper edge of the caudal; the third to the middle of the caudal base; the fourth starts from the throat, passes close to the root of the ventral, and is continued backward to a little beyond the middle of the anal. The two lines running along the anal base to the tail converge about at the middle of the length of the ventrals, and are continued forward on the ridge of the abdomen almost to the isthmus. There is no trace of the branch characteristic of *H. ordinatus*, which begins a little in advance of the ventral origin and extends upward and backward to a point below the middle of the pectoral and sometimes farther back.

No. 38988, U.S.N.M.; Bering Island, March, 1884; N. Grebnitski. Young. D. XX, 23; A. 22; scales, 104.

PLEUROGRAMMUS MONOPTERYGIUS (Pallas), Gill.

No. 33821, U.S.N.M. (1669). Saranskaya Bay, Bering Island, September 30, 1882; L. Stejneger.

There is a color drawing by the collector whose notes upon the species are as follows: "Called by the natives *Sudak*, the Russian name

of *Lucioperca sandra* (Linnaeus); is rather common at Copper Island, where it is extensively used for food. At Bering Island it is said to be rather scarce."

No. 38990, U.S.N.M. Bering Island, February, 1885; N. Grebnitski.

SEBASTICHTHYS, species.

No. 33900, U.S.N.M. (1748). Bering Island, November 26, 1882; L. Stejneger. From the gullet of *Larus canus*. One specimen, same as No. 33864, U.S.N.M., 41 mm. long to base of caudal.

No. 33864, U.S.N.M. (2347). Copper Island, on the beach, spring of 1883; L. Stejneger. Length of specimen, 62 mm.

D. XIII, 15; A. III, 7. Tubes in lateral line 51. The lower jaw projects and the spines of the head are well developed; they comprise nasal, three pairs along the upper edge of the orbit, another pair on the nape and a pair of long spines on the occiput.

COTTUS QUADRICORNIS, Linnaeus.

No. 33875, U.S.N.M. (2487). Bering Island, 1883; L. Stejneger. Young. D. VIII, 14; A. 12.

COTTUS, species.

No. 47571, U.S.N.M. Bering Island, July, 1895; L. Stejneger. D. X, —. Length, 19 mm.; too small for identification.

COTTUS POLYACANTHOCEPHALUS, Pallas.

No. 33845, U.S.N.M. (1815). Bering Island, December 23, 1882; L. Stejneger. D. X, 14; A. 11.

"Color, dark olive gray with irregular lighter mottlings. Belly and sides with large oblong whitish spots. Pectorals dusky, with one perfect and two imperfect yellowish bands. Abdominals whitish, with two broad and distinct blackish cross bands and a fainter and narrower one at the base."—(Stejneger.)

No. 47572, U.S.N.M. Very young, two specimens. Beach, Copper Island, August 6, 1895; L. Stejneger. D. X, 15; A. 13. The larger is only $1\frac{5}{16}$ inches long. These may be *C. niger* Bean.

COTTUS PLATYCEPHALUS, Pallas.

= ? *C. Decastrensis*, Kner.

No. 38983, U.S.N.M. Bering Island, March, 1884; N. Grebnitski.

COTTUS NIGER, Bean.

No. 33899, U.S.N.M. (1464). Bering Island, August 14, 1882; L. Stejneger. "Found on the beach. Iris silvery alternating with violet red."—(Stejneger).

No. 33872, U.S.N.M. (1630). Young. Bering Island, September 12, 1882; L. Stejneger.

No. 33833, U.S.N.M. (1663). Young. Bering Island, September 23, 1882; L. Stejneger.

No. 33887, U.S.N.M. (2260). Young. Copper Island, July 14, 1883; L. Stejneger.

No. 33850, U.S.N.M. (2335). Young. Copper Island, spring, 1883; L. Stejneger.

No. 33881, U.S.N.M. (2336). Young. Copper Island, spring, 1883; L. Stejneger.

No. 33863, U.S.N.M. (2337). Copper Island, spring, 1883; L. Stejneger. D. VII, 17; A. 12. Doubtful identification.

No. 33908, U.S.N.M. (2775). Copper Island, spring, 1883; L. Stejneger. D. IX, 15; A. 12. Doubtful identification.

No. 38979, U.S.N.M. Bering Island (?); N. Grebnitski. D. VII-IX, 15-17; A. 12-13; V. I, 3. Doubtful identification.

No. 38980, U.S.N.M. Bering Island, March, 1885; N. Grebnitski. D. IX, 16; A. 11. Length, $5\frac{3}{8}$ inches.

No. 38981, U.S.N.M. Bering Island, March, 1884; N. Grebnitski.

COTTUS AXILLARIS (Gill), Bean.

No. 39428, U.S.N.M. Bering Island; N. Grebnitski.

Total length, 4 inches; length to caudal base, $3\frac{1}{4}$ inches. Head, $1\frac{1}{8}$ inches; eye, $4\frac{1}{2}$ in head.

The maxilla reaches to below the hind margin of pupil; the ventral to the base of the second anal ray; the pectoral to the base of the seventh anal ray.

The snout is very narrow, acute, shorter than the eye. The interorbital space very narrow, less than one-half length of eye. Postorbital ridges inconspicuous.

Several milk-white blotches at base of pectoral. A band of the same color on the first half of pectoral; two similar blotches behind pectoral and about seven on the side of the body.

B. VI; D. IX, 14; V. I, 3; A. 12; pores 34+2.

ENOPHRYS DICERAUS, Pallas.

No. 39429, U.S.N.M. Bering Island; N. Grebnitski. Length, $1\frac{1}{2}$ inches.

BLEPSIAS CIRRHOSUS (Pallas). Günther.

No. 47563, U.S.N.M. Bering Island; L. Stejneger. Length, $2\frac{7}{8}$ inches. D. IV, III, 23; A. 18; lateral line, 56.

HEMILEPIDOTUS JORDANI, Bean.

No. 33843, U.S.N.M. (1705). Bering Island, November 1, 1882; L. Stejneger. D. XI, 22; A. 18. There is a color drawing of this example by Dr. Stejneger.

No. 38986, U.S.N.M. Bering Island, March, 1883; N. Grebnistki. D. XI, 21; A. 17.

No. 38987, U.S.N.M. Bering Island, December, 1884; N. Grebnitski. Two individuals taken near shore. Mr. Grebnitski gives the native name of *Kalaga*. D. XI, 21; A. 16-18.

ARTEDIUS LATERALIS, Girard.

No. 38985, U.S.N.M. Bering Island, January, 1885; N. Grebnitski. "From stomach of *Gadus morrhua*." D. IX, 18; A. 13.

GYMNACANTHUS PISTILLIGER (Pallas), Gill.

No. 33889, U.S.N.M. (1948). Bering Island, May 12, 1883; L. Stejneger.

A young example, 50 mm. long, from the stomach of a cod (*Gadus morrhua*). D. XI, 15; A. 18. On account of the size and condition of the specimen its identification is doubtful; indeed, the armor of the head and its length resemble those characters in *galeatus* rather than *pistilliger*.

CYCLOPTERICHTHYS VENTRICOSUS (Steindachner), Jordan and Gilbert.

No. 33837, U.S.N.M. (2012). Bering Island, May 7, 1883; L. Stejneger.

"This is the *Miakia Riba* or *Miakinka*, i. e., soft fish. The first one of this spring (1883) was taken on March 21, and they were afterwards found in great numbers on the beach up to the middle of May, when they again disappeared.

"In the beginning the natives eat them with great gusto, but soon get tired of them, and they are then used only for food for the sledge dogs. Mr. Volokitin informed me that the same species occurs, but much more scarce, at Atka, on which island he was born."—(Stejneger.)

Dr. Stejneger made a color drawing of this species, one-fourth natural size.

No. 33806, U.S.N.M. (2513). Bering Island, spring of 1883; L. Stejneger. D. 10; A. 7; P. 19. "'*Miakinka*' of the natives."—(Stejneger.)

EUMICROTREMUS SPINOSUS (Müller), Gill.

No. 38976, U.S.N.M. Bering Island; N. Grebnitski. "From stomach of *Alepidosaurus esculapius*."

Alepidosaurus esculapius is not in the collections forwarded by Messrs. Grebnitski and Stejneger, but, as it is quite well known at Unalaska, there is little doubt that it occurs in the deep waters around the Commander Islands.

LIPARIS CALLIODON (Pallas), Günther.

No. 33822, U.S.N.M. (1124). Bering Island, May 30, 1882; L. Stejneger. Found on the beach. A female with eggs somewhat developed. Length, 77 mm. to caudal base.

No. 33823, U.S.N.M. (1662). Bering Island, September 23, 1882; L. Stejneger. Length to caudal base, 67 mm. Head, 17 mm. Eye, $2\frac{1}{2}$ mm. Greatest height, 15 mm.

The maxilla reaches nearly to the vertical through the middle of the eye. Interorbital space, 7 mm.; snout, 5 mm. Distance of dorsal from snout, 24 mm.; anal from snout, 31 mm. Ventral disk, 7 mm. Middle caudal rays, 12 mm. Length of pectoral, 9 mm. Vent from snout, 22 mm. Width of head, 14 mm.

D. about 33; A. 24 or 25. Colors: "Above yellowish olive, whitish below." "Picked up on the beach at low water."—(Stejneger.)

No. 33846, U.S.N.M. Two specimens from Bering Island, the larger one measuring 88 mm. to the caudal base and the smaller one 71 mm. Both are females, the larger one with eggs well developed and the smaller with mature ova. D. 31; A. 27.

No. 33856, U.S.N.M. (2338). Copper Island, spring, 1883; L. Stejneger. The ventral disk is about one-half as long as the head. The eye one-half length of snout, less than one-sixth length of head. D. about 32; A. 24.

The larger specimen, 69 mm. long to base of caudal, is a female with eggs moderately developed. The smaller is 59 mm. long to caudal base.

No. 33884, U.S.N.M. (2339). Copper Island, spring, 1883; L. Stejneger. Two young examples, 33 mm. in length each. These have the first dorsal elevated, and are probably males.

No. 38972, U.S.N.M. Bering Island, March, 1884; N. Grebnitski.

Eight specimens. Two of them have D. VII, 26 and V, 30; A. 25; the rest have the anal rays 28 to 30. This series, together with Dr. Stejneger's examples, will prove that *L. cyclopus* of Günther is identical with *L. calliodon*.

No. 38973, U.S.N.M. Bering Island, March, 1883; N. Grebnitski.

Two specimens. Anal rays 26 in one, 27 in the other.

No. 47561, U.S.N.M. Bering Island; L. Stejneger. Eight individuals, the largest $5\frac{3}{8}$ inches long, the smallest $2\frac{3}{8}$ inches. The largest has D. V, 31; A. 29.

LIPARIS TUNICATA, Reinhardt (?).

? *Liparis fabricii*, GÜNTHER, Cat., III, 161.

No. 38975, U.S.N.M. Bering Island, November, 1883; N. Grebutiski.

D. 7, 33; A. 32; P. 37; C. 13; length, 9 inches. Color, uniform purplish brown, except the disk, which is pale. First seven dorsal rays differentiated from the rest of the fin and somewhat elevated.

Snout broad and blunt, projecting beyond the lower jaw; its length one-third the length of the head, and less than the width of the interorbital space, which is three-sevenths of the length of the head. Anterior nostrils tubular, posterior not tubular. The length of the anterior nostril is about two-thirds that of the eye. Nape moderately

elevated. Eye very small, its length equal to one-fifth the width of interorbital space, and less than one-third the length of the snout.

The angle of the mouth is about under the middle of the eye; the width of the mouth at the angle equals the length of the head without the snout. The greatest width of the head is equal to its length, which is three-elevenths of the total to caudal base. Teeth in many rows in the jaws, sometimes blunt, but nearly all sharp pointed; no apparent tricuspid teeth.

The disk is placed very little behind the vertical through the hind margin of the eye. Its width and length are nearly equal, the latter equal to width of interorbital space and contained $8\frac{1}{2}$ times in the total length to caudal base.

The distance of the dorsal from the snout is one-third of the total length to caudal base. The longest dorsal ray is one-half as long as the head.

The distance of the vent from the disk is a little more than one-fourth the length of the head, the vent being almost under the origin of the dorsal. The anal origin is under the eleventh dorsal ray.

The pectoral reaches beyond the vent; its length equals that of the postocular part of head.

The caudal is one-half as long as head, and is not continuous with the dorsal and anal.

This does not agree with the descriptions of *L. tunicata* and *L. fabricii* in color and in the continuity of the vertical fins, but in other respects the agreement appears to be perfect. *L. arctica*, Gill, which this species resembles in color, has the vertical fins confluent, the interorbital space one-third length of head, the caudal one seventh of total length, and the anterior nostrils simple and posterior tubular.

HYPASAGONUS QUADRICORNIS (Cuvier and Valenciennes), Gill.

No. 38984, U.S.N.M. Bering Island, January, 1885; N. Grebnitski. D. X, 6; A. 10; V. 3. "From stomach of *Gadus morrhua*."

PODOTHECUS ACIPENSERINUS (Tilesius), Gill.

No. 47570, U.S.N.M. Bering Island; N. Grebnitski. Length, $4\frac{7}{8}$ inches. D. IX, 6; A. 7; L. lat., 37.

Head $3\frac{2}{3}$ in length to caudal base. Depth equals one-half head. Eye, one-half snout, $4\frac{1}{2}$ in head. A pair of spines at tip of snout, a pair on snout near tip, a pair close together on top of snout near the eyes. Supraocular produced behind into a short flat spine on each side. Tufts of cirri under the snout and near angle of mouth.

ASPIDOPHOROIDES MONOPTERYGIUS (Bloch), Storer.

No. 33849, U.S.N.M. (2769). Copper Island 1882; L. Stejneger. One specimen, 52 mm. long. D. V; A. 5; L. lat., 49.

BATHYMASTER SIGNATUS, Cope.

No. 33895, U.S.N.M. (1228). Copper Island, June 28, 1883; L. Stejneger. Three specimens.

These are the youngest examples of the species in the Museum; the length is only 47 mm., and the sides are banded, the number of bands being 9 or 10, about two-thirds as wide as the eye is long and extending upon the dorsal fin. The dark blotch at the beginning of the dorsal is very distinct, as is also the line of minute black dots under the dorsal base. D. 46; A. 32; scales, 97.

No. 34869, U.S.N.M. (No. 2333). Bering Island, Stare Gavan; L. Stejneger. Length of example, 180 mm.; D. 44; A. 33; lateral line, 94, not quite reaching base of caudal and ending much nearer dorsal outline than middle of depth. Head scaleless, but profusely covered with mucous pores. Gill rakers very short, 13 below angle of first arch.

No. 47559, U.S.N.M. Bering Island; L. Stejneger. One example, $7\frac{1}{2}$ inches long. D. 45; A. 31; lateral line, 98.

No. 38968, U.S.N.M. Bering Island, 1885; N. Grebnitski. One young "from stomach of *Gadus morrhua*."

No. 38969, U.S.N.M. Bering Island, November, 1883; N. Grebnitski.

No. 38970, U.S.N.M. Bering Island, August, 1884; N. Grebnitski.

No. 33890, U.S.N.M. (1947). Bering Island; L. Stejneger, March 12, 1882. From stomach of *Gadus morrhua*.

Length, $4\frac{1}{8}$ inches; head, $\frac{7}{8}$; depth, $\frac{9}{16}$; snout shorter than eye, which is nearly 4 in head. Maxilla extends to below hind margin of eye. Lateral line pores about 90.

The condition of the specimen is such that the dorsal can not be counted with any certainty, but there are not fewer than 41 rays and spines. A. 33.

Body light brown without traces of black cross bands. Mucous pores on postorbital region and opercles with narrow black margin giving the appearance of black specks; fins dark. More elongate than the ordinary *signatus*, being somewhat similar in form and coloration to *B. hypoplectus* of Gilbert, but differing from the latter in having a greater cleft of mouth, scaleless cheeks, and gill membranes not broadly united.

TRICHODON TRICHODON (Tilesius).

No. 33841, U.S.N.M. (1955). Bering Island, March 14, 1883; L. Stejneger. "Found dead ashore. Silver colored with black spots."—(Stejneger.)

No. 33828, U.S.N.M. (1968). Bering Island, April 10, 1883; L. Stejneger. Four examples, from 5 inches to $6\frac{1}{2}$ inches long.

"Iris silver colored with faint pinkish reflex. Color silver white with a faint gloss of brass above. Spots blackish. Aleut name, *Anamlukh*. Rather common at that time."—(Stejneger.)

No. 33878, U.S.N.M. (2316). Copper Island; L. Stejneger.

No. 38971, U.S.N.M. Bering Island, March, 1884; N. Grebnitski.
Three individuals.

ANOPLARCHUS ALECTROLOPHUS (Pallas), Jordan and Gilbert.

No. 33904, U.S.N.M. (1029). Bering Island, May 10, 1882; L. Stejneger. Two specimens. Length, 90 to 97 mm. D. LXI; A. 43.

The following color notes were made by the collector: Color, olive brown, with darker and lighter spots. On the lower jaw, several transverse light, dark-bordered stripes. Both of these have the crest on the head well developed.

No. 33819, U.S.N.M. (1126). Bering Island, May 30, 1882; L. Stejneger. On the beach. Forty-nine specimens. Length, 40 to 122 mm.

No. 33894, U.S.N.M. (1463). Bering Island, August 14, 1882; L. Stejneger. "Beach. Color purplish black, with cream-colored figures." Length, 28 mm. D. LIX; A. 42.

No. 33893, U.S.N.M. (1921). Bering Island, February 20, 1883; L. Stejneger. Found on beach.

Colors observed by the collector: Color purplish blackish brown, with bluish white spots on anal and sides of lower jaw. Length, 93 mm. Crest well developed.

No. 33905, U.S.N.M. (1946). Bering Island, March 11, 1883; L. Stejneger. "Color purplish blackish brown." Length, 70 mm.

No. 33891, U.S.N.M. (1949). Bering Island, March 13, 1883; L. Stejneger. A color drawing of this example by Dr. Stejneger. Length, 92 mm. D. LXII; A. 45.

No. 33871, U.S.N.M. (2345). Copper Island, spring of 1883; L. Stejneger. Length, 78 mm. D. LXII; A. 43. Crest well developed.

No. 33892, U.S.N.M. (2353). Bering Island, spring, 1883; L. Stejneger. Three young, 36 to 50 mm. long. D. LXIII; A. 45 in the largest.

No. 33880, U.S.N.M. (2488). Bering Island; L. Stejneger. Three specimens, length, 75 to 85 mm. One of these has D. LX; A. 45, and the scales absent on anterior half of body in front of seventh anal ray; it has also a low crest. The same absence of scales is found in 38960 and 38962 of Grebnitski's collection, and in various examples of Dr. Stejneger's.

No. 38961, U.S.N.M. Bering Island, November, 1883; N. Grebnitski. One specimen 90 mm., with a high crest. D. LXI; A. 44.

No. 38962, U.S.N.M. Bering Island, March, 1884; N. Grebnitski. Twenty-six specimens, showing a great deal of variation in the development of the crest. The smallest is 61 mm. long, largest 113. D. LXII; A. 45. In the largest example, D. LXIII; A. 44.

The variability in the squamation is still further shown in the following individuals from the State of Washington.

D. LVI; A. 39. The length of this specimen is 115 mm. It has a

distinct black blotch at the beginning of the dorsal fin, on the membrane between the first and second and second and third spines. All of the eleven specimens of this catalogue number (34321, Port Townsend, Washington) have the same characteristic blotch at the origin of the dorsal, but it is usually single and about as long as the eye.

In all of these specimens the anterior portion of the body from the head to sixth anal ray is naked. In one of the examples, 113 mm. long, the dorsal has 55 spines and the anal 39 rays.

In a specimen, No. 42053, from Seattle, Washington, 132 mm. long, the anterior portion of the body is naked, as in the other specimens. The black blotch is present on the dorsal, and the same is true in all of the twelve examples of this entry. The dorsal in a very large specimen (140 mm. long) has only 57 spines, and the anal 39 rays. Still another example has D. LVI; A. 39.

PHOLIS ORNATUS (Girard), Gill.

No. 33826, U.S.N.M. (1028). Bering Island, May 10, 1882; L. Stejneger. Dr. Stejneger describes the color as bronze olive. There are two specimens, the larger one 90 mm. and the smaller 56 mm. long to the base of the caudal fin.

No. 33861, U.S.N.M. (1125). Bering Island, May 30, 1882; L. Stejneger. Total length of specimen, 115 mm.; length of caudal, 7 mm. The dorsal contains about 75 spines.

No. 38965, U.S.N.M. Bering Island, March, 1884; N. Grebnitski. Eleven specimens, varying in color from light olive brown to bright pink. All have the ocellated spots along the spinous dorsal well developed. They vary in length from 77 to 130 mm.

No. 33873, U.S.N.M. (2342). Copper Island, April, 1883; L. Stejneger. On the beach. Length to base of caudal, 117 mm. D. LXXX; A. II, 37; head scaleless.

No. 33886, U.S.N.M. (2344). Copper Island, spring, 1883; L. Stejneger. Found on the beach. Length of specimen, 53 mm. D. LXXIX; A. II, 37.

PHOLIS RUBERRIMUS (Cuvier and Valenciennes).

No. 33834, U.S.N.M. (1050). Bering Island, May 15, 1882; L. Stejneger. Length of specimen, 205 mm. D. XCV; A. II, 44.

Eye equal to snout, 5 in head. Mouth very oblique, the maxilla scarcely reaching to below the front of the eye, its length $3\frac{1}{2}$ in head; mandible $2\frac{1}{2}$ in head; middle caudal rays, 2 in head.

The head is contained in the total length, without caudal, 9 times; the greatest depth 8 times. The body is very much compressed; the vent is nearly midway between the end of the head and the origin of the middle caudal rays. The pectoral is well developed, containing 15 rays. Its length equals two-fifths that of the head. The scales are very thin, small, and inconspicuous. Ventrals, under the base of the

pectorals, each consisting of a short spine only two-thirds as long as the eye. The caudal is united with the dorsal and the anal, but is not tapering.

The following are Dr. Stejneger's field notes: "Color olive brown, with minute black spots; belly yellowish; a white line runs through the lower border of the nostrils, below the eyes backward to the posterior margin of the operculum in the direction of the pectoral fin."

No. 33855, U.S.N.M. (2341). Copper Island, spring of 1883; L. Stejneger. Length of specimen, 155 mm.

D. XCIV; A. II, 46 or 47. In this specimen the maxilla extends to a point below the front of the eye. The pectoral is two-fifths as long as the head, and the ventral but two-thirds as long as the eye. The caudal is connate with the dorsal and anal, but is distinctly differentiated from these and consists of a large number of rays (22).

No. 33877, U.S.N.M. (2341). Same as above. This example, which is 117 mm. long, has 92 dorsal spines. Its pink color is still preserved, and there are traces of numerous narrow, nearly vertical, pale bars across the posterior portion of the dorsal fin.

No. 33963, U.S.N.M. Bering Island, March, 1884; N. Grebnitski. Six specimens. The bright pink color of these examples is well preserved. In one of them the dorsal has 94 spines; anal II, 46.

The coloration of the species is very brilliant. Across the spinous dorsal there are 20 narrow, nearly vertical, pale streaks. Similar streaks to the number of 12 cross the anal. Along the middle line of the body there are 18 small, narrow, round, pale spots at irregular intervals about as large as the pupil. Some of the specimens still show the white line running obliquely from the tip of the snout under the eye to the end of the head, limited above in some specimens by a narrow line slightly darker than the body color. The pectoral is pale at base and tip, the middle portion pink. Sometimes the pink area is closer to the base, leaving most of the fin pale.

The length of these examples varies from 130 to 150 mm. In only one of these the caudal fin is sharply differentiated from the dorsal and anal by the oblique direction of its rays.

GYMNELIS VIRIDIS (Fabricius), Reinhardt.

No. 33897, U.S.N.M. (1005). Copper Island, beach, May 6, 1882; L. Stejneger.

No. 33901, U.S.N.M. (1513). Copper Island, May 6, 1882; L. Stejneger.

No. 33885, U.S.N.M. (2343). Copper Island, beach, spring, 1883; L. Stejneger.

No. 33870, U.S.N.M. (2345). Copper Island, beach, spring, 1883; L. Stejneger.

ANARRICHAS LEPTURUS, Bean.

No. 33902, U.S.N.M. (1001). Bering Sea, May 1, 1882; L. Stejneger. A single very young individual was found on the deck of the vessel after a gale.

The length is slightly more than 19 mm. The dorsal is long and begins near the head. The anal is long and the vent is not far behind the head. Eye very large. Pectorals large. A separate caudal. I am unable to find ventrals. Although the specimen is very small, it is pretty certain that it represents the species named.

AMMODYTES PERSONATUS, Girard.

No. 33898, U.S.N.M. (1706). Bering Island, November 3, 1882; L. Stejneger, "Cast ashore. Color silvery; back green, iridescent at the border of the silvery white of the lower surface; on top of head a golden yellowish spot." Three specimens; average length, 83 mm.

No. 33906, U.S.N.M. (1707). Same as above; six specimens, the largest 85 mm. long.

No. 33907, U.S.N.M. (1708). Seven specimens, the largest 90 mm., same locality as the two preceding and the same notes by the collector.

No. 33883, U.S.N.M. (2189). Bering Island, May, 1883; L. Stejneger. Branchiostegals 6. D. 61; A. 29. Lateral folds, 160; pores, 133. Length of specimen, 117 mm.

No. 47562, U.S.N.M. Bering Island; L. Stejneger. D. 59; A. 28. Length, $6\frac{3}{4}$ inches; head, $1\frac{3}{8}$ inches. Mandible reaches to below middle of eye. Depth, three-fourths of an inch, one-eighth of total without caudal. Head nearly $4\frac{1}{2}$ in total to caudal base. Lateral folds, 142.

GADUS MORRHUA, Linnæus.

No. 33825, U.S.N.M. (1681). Bering Island, October 10, 1882; L. Stejneger. A single young example of which Dr. Stejneger made a color drawing.

POLLACHIUS CHALCOGRAMMUS (Pallas), Jordan and Gilbert.

No. 33882, U.S.N.M. (1893). Bering Island, March 30, 1882; L. Stejneger. A single example $4\frac{1}{2}$ inches long.

ELEGINUS NAVAGA (Kolreuter).

No. 33840, U.S.N.M. (1902). Bering Island, February 10, 1883; L. Stejneger. This was found dead on the beach. Dr. Stejneger noted the following colors: "Above olive gray, below whitish, sides with a gloss of brass."

No. 33829, U.S.N.M. (1903). Bering Island, February 11, 1883; L. Stejneger.

No. 33835, U.S.N.M. (1904). Bering Island, February 11, 1883; L. Stejneger.

No. 38956, U.S.N.M. (1). Bering Island, March, 1884; N. Grebnitski. One example.

No. 38957, U.S.N.M. Bering Island, February, 1885; N. Grebnitski. One specimen from a fresh-water lagoon, 2 miles from the station.

PLEURONECTES STELLATUS, Pallas.

No. 33842, U.S.N.M. (1642). Bering Island, September, 1882, L. Stejneger.

GASTEROSTEUS CATAPHRACTUS (Pallas), Jordan and Gilbert.

No. 33867, U.S.N.M. (1027). Bering Island, May 10, 1882, L. Stejneger. Fifteen specimens.

No. 33860, U.S.N.M. (1050). Bering Island, May 15, 1882, L. Stejneger. Length of specimen, 71 mm.

D. II, I, 14; A. I, 9; P. 10. Lateral plates, 34. The ventrals extend to the end of the pubic bone. The upper and lower pectoral rays are slightly longer than the middle rays, so that the fin when naturally expanded shows a slightly concave posterior margin. The caudal keel is well developed. The ventral spines are strongly serrated on their upper edge and rough along the lower margin with some strong serrations at the base.

No. 38954, U.S.N.M. Bering Island, N. Grebnitski. Four specimens, ranging from 71 to 80 mm. in length.

GASTEROSTEUS MICROCEPHALUS, Girard.

No. 33853, U.S.N.M. (1272). Saranna Lake, Bering Island, July 17, 1882, L. Stejneger. Three specimens, the two larger 90 mm., the smallest 50 mm. long.

D. II, I, 11; A. I, 8. There are eight plates developed on each side; the first two small, the last reaching to or slightly beyond the end of the extended pectoral.

In general appearance this species resembles *cataphractus* with the posterior portion of the body naked.

No. 38955, U.S.N.M. Bering Island, N. Grebnitski. One specimen, 70 mm. long. This is a very short-bodied individual, its depth equaling two-sevenths of the length without caudal. It has only four large lateral plates developed and two or three rudiments.

Four additional examples were obtained here.

No. 38952, U.S.N.M. (1337). Bering Island, July 28, 1882, L. Stejneger. "From fresh-water pond behind the new cemetery."

Seven specimens, young, the largest being but 18 mm. long; one with three dorsal spines. The lateral plates on some of the examples are not developed, but there is little doubt that these belong to *microcephalus*.

No. 39430, U.S.N.M. Bering Island, N. Grebnitski. Two specimens, the larger 80 and the smaller 65 mm. long. The former has eight plates developed, the eighth being just behind the end of the extended pectoral; the anterior three are very small. The ventrals do not reach to the end of the pubic bone. D. II, I, 12; A. I, 9.

The smaller example has one more plate developed on the left side than on the right.

GASTEROSTEUS PUNGITIUS BRACHYPODA, Bean.

No. 33896, U.S.N.M. (1273). Bering Island, July 20, 1882, L. Stejneger. Four examples, the largest 28 mm. long. From small fresh-water pond in Gavanskaya Swamp. D. X, 10; A. I, 9.

No. 33824, U.S.N.M. (1337). Bering Island, July 28, 1882, Stejneger. From fresh-water pond behind the new cemetery. Female 60 mm. long, with eggs. Dorsal spines alternating, XI, 11; A. I, 9. The ventral spines do not extend to the posterior end of the pubic bone; their length equals two-fifths that of the head, being nearly equal to eye and snout combined.

No. 38953, U.S.N.M. Bering Island, January, 1885, N. Grebnitski. Six specimens. Some of these specimens show distinct dark bands along the sides, in one example 11 in number. In other specimens the bands are more or less obscure. There is a curious diversity in the arrangement of the dorsal spines, which in some cases are nearly in a straight line throughout the greater part of the length of dorsal base, while in others the alternation is so decided as to make the top of the back resemble a hedge. The specimens with distinct bands are apparently males. They vary in length from 38 to 62 mm. Five of the larger examples have the stomachs distended by intestinal worms. From a single specimen four of these large parasites resembling tape worms were taken, the worms being broad, flat, and about 25 mm. in length.

No. 39431, U.S.N.M. Same as above. Six specimens varying in length from 52 to 80 mm. In all of these the ventral spine is very short, shorter than the pubic bone; the largest example has the ventral spine one-third as long as the head. D. VIII-X, I, 9-10; A. I, 8-9.

No. 39432, U.S.N.M. As above. One specimen, 70 mm. long. In this example the dorsal has 12 spines and 10 rays, and the anal is I, 9; length, $2\frac{1}{6}$ inches.