

## BIOLOGICAL NOTES.

(No. 1. Issued July, 1900.)

For the purpose of providing a repository for current observations and a means for the prompt publication of useful notes on the marine life of southern New England, special papers will be issued from time to time containing brief articles presented by persons pursuing investigations at or near Woods Hole. Communications embodying new observations on the habits, spawning, migration, distribution, abundance, structure, etc., of the animals of the surrounding waters are solicited, and notes on the aquatic vegetation of the region are also desired. Due credit for the contributions will be given.

### *Phoca vitulina*, Harbor seal.

Seals are found regularly in the vicinity of Woods Hole, appearing about the middle of October and remaining until about the first of May. They are usually first noticed at the head of Buzzards Bay, on Scraggy-neck Ledge, where a herd of 100 or 150 may be seen off and on through the winter. A smaller herd frequents Lackey Bay. Several seals are caught each year by Mr. Edwards in fyke nets set at the head of Great Harbor; the record for the past two seasons being one in each of two fykes on January 21, 1899, and one on March 20, 1900. In the winter of 1898-99, one was taken with the iron ring from the end of a lobster pot tightly encircling its neck; the ring had cut its way through the soft tissues and partly severed the trachea. The seals enter the fykes almost always at night, and are dead when found, with their heads forced through the first funnel. In 1887, during two weeks in January, 21 were taken by Mr. Edwards in gill nets set in the harbor, 8 being obtained alive; all were caught at night, mostly during stormy weather. Of late, the seals have not entered the gill nets. They weigh from 80 to 90 pounds, and dissection has shown that they subsist chiefly on cunners. (H. M. SMITH.)

### *Pseudopleuronectes americanus*, Winter Flounder.

Mr. S. R. Williams, of Harvard University, has furnished the following data: The young of the winter flounder were abundant from the time of his arrival at Woods Hole, June 4, 1899, until June 16 and 17, after which they were less frequently taken. There are apparently two sizes at which metamorphosis takes place. The smaller "turns" when about 8 mm. in length; the larger when nearly twice as long, 14 or 15 mm. in length, and there seem to be no fishes of intermediate length undergoing metamorphosis. All young fish over 8 mm. in length may be depended upon to reach a length of 14 mm. before turning. This interesting fact is based upon an examination of 1,000 small fish, of which about two-thirds were of the smaller variety and one-third of the larger. The young fish were much more abundant in 1899 than at any time during the summer of 1898. (H. C. BUMPUS.)

### *Pseudopleuronectes americanus*.

During the winter of 1897-98 my attention was called to the large number of flat-fish bearing blotches of color on the lower side, which were on sale in the Providence market. These "black-bellied" flat-fish were quite abundant in Greenwich Bay, Rhode Island, and during March, 1898, an assistant succeeded in collecting from them a quantity of eggs and milt. The fertilized eggs were sent to the hatchery at Woods Hole, where they were hatched, and the fry were planted at Waquoit

Bay, a small inlet about 8 miles to the eastward of Woods Hole. The fact that several black-bellied flat-fish were taken at Waquoit during the early months of the year 1900 is of special interest, since it would seem to indicate that the blotching of the lower side of the fish is an hereditary character, and it also gives strong evidence that the efforts of the Commission to increase the number of shore fishes by artificial propagation are by no means futile. Mr. Vinal N. Edwards states that he has seined at Waquoit for nearly thirty years, and that he never found a flat-fish from that locality that was either spotted or dark on the lower side until February and March of the present year. The specimens which we have taken this year are all between 7 and 8 inches in length—that is, they are two years of age. We have not taken a single specimen, either less than two years of age or more than two years of age, that has any marking upon its lower surface. It would seem, then, that these black-bellied specimens have grown from the fry planted at Waquoit in the early spring of 1898. (H. C. BUMPUS.)

***Pseudopleuronectes americanus.***

A male in spawning condition, 14 inches long, taken in a fyke net in Waquoit Bay, February 23, 1900, has its eyes and mouth on the left side—the first of the kind I have taken. (V. N. EDWARDS.)

***Bothus maculatus, Sand-dab; Window-pane.***

In 1899 Mr. Williams found the "window-pane" not so abundant as in 1898. The growth of these fish is somewhat remarkable. Fish skimmed from the surface and placed in glass vessels increased from 10 to 21 mm. in ten days. (H. C. BUMPUS.)

***Paralichthys oblongus, Four-spotted Flounder.***

While seining at the head of Great Harbor on June 27, Mr. Williams caught a young four-spotted flounder about 2½ inches in length. This capture is of considerable interest, as the young have never before been taken at Woods Hole, although they were taken at Menemsha in 1886. (H. C. BUMPUS.)

***Tautoga onitis, Tautog.***

During the winter of 1898–99 many tautog perished because of the formation of anchor ice in the beds of Vineyard Sound, where they are accustomed to spend the winter. A great many bodies were washed up on the shore and were picked up by the fishermen and sent to market. In the summer of 1899 the tautog were very much less abundant than during the previous years, and there were no fishermen who found it profitable to fish for them. One is naturally inclined to attribute their present scarcity to the mortality mentioned. The winter of 1899–1900 was exceptionally mild and no dead tautog were seen along the shores. (H. C. BUMPUS.)

***Cryptacanthodes maculatus, Ghost-fish.***

On January 19, 1900, a ghost-fish, 11 inches long, was taken at Edgartown and sent to the Commission. Only two other specimens are known to have been taken in this vicinity, one in 1875, the other in 1896. (V. N. EDWARDS.)

***Leptocephalus conger, Conger Eel.***

During the first half of November, 1899, conger eels were plentiful and very large; and some were taken almost every day. On the morning of November 9 two, weighing 12 pounds each, were caught. (V. N. EDWARDS.)

***Fistularia tabacaria, Trumpet-fish.***

A large specimen of this straggler from the tropics was seined by me as late as November 1, 1899. It was 20 inches long, exclusive of the tail. (V. N. EDWARDS.)

***Exocoetus heterurus, Flying-fish.***

In 1886, and possibly on one previous occasion, this fish has been detected at Woods Hole. One 12 inches long was seined at Menemsha Bight, Marthas Vineyard, on August 1, 1899; at the same place another, somewhat smaller, was caught in a fish trap on August 21. (H. M. SMITH.)

***Rachycentron canadum, Cobia; Crab-eater.***

This fish has rarely been observed in recent years, and was much commoner twenty-five years ago than at any time since; only small (5 or 6 pound) specimens have heretofore been seen. On July 18, 1899, a fine example 4½ feet long, and weighing 60 pounds, was caught in the Fish Commission trap in Buzzards Bay and retained alive until August 31. (H. M. SMITH.)

**Tetragonurus cuvieri, Square-tail; Sea-raven.**

This very rare species, described from Nice in 1810, was until 1890 known only from the coast of southern France and the Madeira Islands. The original describer considered it a deep-water form that approached the coasts only for spawning purposes. On November 10, 1890, the species was added to the western Atlantic fauna by the capture of a specimen at Woods Hole. The taking of another at the same place, on August 1, 1899, is interesting and unexpected; the fish, about 1½ inches long, was found under a mass of floating rock-weed in Vineyard Sound. (H. M. SMITH.)

**Alutera monoceros, File-fish.**

The detection of this very interesting East Indian species on our coast at Woods Hole in August, 1898, was referred to in a recently issued paper by the writer. While possibly this is the species recorded from Cuba by Parra in 1787 and by Poey in 1863, the evidence is far from conclusive. The seining of a second specimen, 8½ inches long, at Menemsha Bight, on August 1, 1899, is now recorded. (H. M. SMITH.)

**Gadus callarias, Cod.**

On the conclusion of the fishing for brood cod in the fall of 1899, 14 cod weighing from 4 to 6 pounds, taken with hand-lines off Nomans Land or Nantucket, were inadvertently left in the well of the *Grampus* and not discovered until April, 1900. These fish were placed in the well not later than November 18, possibly some days before. During this time they had not been fed, and had only such food as came through the holes in the well. When released in Gloucester harbor on April 16, they were found to be lively and strong, although somewhat emaciated, and it was noticed that their backs and sides were much darker than normal, while the belly was unusually light-colored. (E. E. HAHN.)

**Gadus callarias, Cod.**

On January 11, 1899, 2,260,000 recently hatched cod were planted in Eel Pond, at Woods Hole. The fish were kept under observation until June 20, 1899, by which time only a few remained in the pond. The following extreme and average lengths were exhibited by specimens seined at intervals of about one week during April, May, and June:

Date.	Extreme length.	Average length.	Date.	Extreme length.	Average length.
	<i>mm.</i>	<i>mm.</i>		<i>mm.</i>	<i>mm.</i>
April 8 .....	29 to 38	32.9	May 19.....	45 to 53	47.7
April 17 .....	33 47	38.8	May 25.....	58 68	64.0
April 25 .....	34 49	40.0	June 6.....	71 76	73.5
April 28 .....	36 56	41.0	June 12.....	71 73	72.0
May 5.....	31 44	37.4	June 20.....	73 77	75.0
May 13.....	35 51	42.8			

(H. M. SMITH.)

**Solen ensis.**

In the early evening of June 20, 1899, a large number of young razor-clams, measuring from 1 to 10 mm. in length, were caught in the auftrieb at Wickford, R. I. These clams, some of them nearly half an inch long, do not, of course, possess a ciliated swimming organ. The larger specimens had shells which were hard and comparatively heavy, and all fell directly to the bottom when transferred from the tow-net to a dish of water. Occasionally, however, they arose and swam to the surface, propelling themselves rapidly by a curious kicking movement of the very powerful foot. When they were taken the evening was cloudy and a high wind was blowing from the south. The temperature of the water was 72° F., and the density at the surface was 1.0202. (A. D. MEAD.)

**Naushonia crangonoides.**

A beautiful specimen of this rare decapod was found in the sand on the shore of Ram Island, near Woods Hole, July 22, 1899. It was a female bearing bright orange-colored eggs and nearly 1½ inches in length. Its behavior in captivity was much like that of *Gebia* and *Callinassa*. It was found below a crater-like depression, evidently of its own making, and lived in the laboratory in a shallow dish of sea water until December 17, 1899. The type specimen of this crustacean was taken by Prof. H. C. Bumpus near the "Gutter" on Naushon Island, February 13, 1893, and is now in the collection of the Essex Institute. The specimen captured in 1899 is the only other one known. (G. M. GRAY.)

**Homarus americanus, Lobster.**

In the fall of 1899 about 20 lobsters were left in a car in the "basin" at the Fish Commission wharf. Near the end of March 1900, when the car was opened, all seemed to be in a perfectly healthy condition. (GEORGE M. GRAY.)

**Nereis limbata.**

This annelid, which is usually seen only at night, when attracted by artificial light, was observed in great numbers in the daytime at Wickford, R. I., on May 31, 1899. The house-boat laboratory of the Rhode Island Fish Commission contains a "well" 12 feet wide and 30 feet long, entirely open below. In this space myriads of *Nereis* were swimming in their characteristic excited manner and discharging their eggs during the whole forenoon of May 31. It is difficult to give an adequate idea of their great numbers. A solid quart or more taken out with a scoop net made no appreciable difference in the appearance of the swarm. Throughout the day the sun was shining brightly, and yet the worms behaved exactly as one sees them by the light of a lantern at night. The males were more abundant than the females, and swam with their peculiar swift, gyrating movement, or in small circles, while the females swam more slowly, and after discharging their eggs, collapsed and sank to the bottom. The water was literally full of their eggs, which were fertilized and were developing normally. The worms were first observed at 7 o'clock in the morning, and remained with little decrease in numbers until about 10 o'clock, when they became gradually fewer. At 2 p. m., however, hundreds were still present in the "well." In the water outside the house-boat only a very few were seen even in the early forenoon. Although these annelids may be taken almost any night in greater or less abundance, the singular phenomenon just described has not been repeated. (A. D. MEAD.)

**Nereis virens.**

On March 24, 1900, "clam worms" were seen swimming in the shallow water along the shore of Monamisset Island, near Sheep Pen Cove. Nearly 300 specimens were captured in about an hour's time. As the tide rose the worms burrowed down into the sand, several being taken when the head and a portion of the body were hidden beneath the surface. On the morning of March 26, when the same locality was visited again, only 2 specimens were to be seen; but an hour later, soon after 12 o'clock, when the tide had turned and was rising, about 150 were taken. On the following morning, as the tide was running out, only a single specimen could be found, but after the tide had turned they were so abundant that more than 500 were picked up in an hour. These worms schooled in the shallow water for more than an hour, and were seen in other localities also. Although the greater number were of the characteristic olive-green color, some were dull yellowish-orange. After the worms were placed in a bucket they discharged their sexual products until the water looked like milk. On subsequent days only scattering individuals were taken. (GEORGE M. GRAY.)

**Chaetopterus pergamentaceus.**

During the extremely low tides of December, 1899, hundreds of these singular worms were killed by the cold. (H. C. BUMPUS.)

**Thyone briareus.**

There has been some lack of definite information in regard to the habits of the littoral echinoderms during cold weather. In December, in 1899, I visited the colony of these holothurians at Hadley Harbor, and found them shriveled up into contracted spheres, the tentacles completely withdrawn, and the animals hidden several inches below the surface. On March 30, 1900, I found them just below the surface, the posterior end of the body extended, and the respiratory function evidently going on with characteristic energy, but the anterior end of the body was still deeply buried in the mud, and not a single specimen was found with expanded arms. (GEORGE M. GRAY.)

**Sertularia argentea.**

On April 6, 1900, several specimens, with ripe gonophores, were dredged off Nobsque Point. Only the dead stalks are found during the summer months. (GEORGE M. GRAY.)

## ADDITIONS TO THE FISH FAUNA IN 1899.

The summer and fall of 1899 yielded an extraordinary number of species new to the Woods Hole region, raising the list of known forms to 240. Most of the species were observed only in Katama Bay, a small body of shallow water separating the eastern end of Marthas Vineyard from Chappaquiddick Island. The 16 fishes whose names follow are all southern species, and most of them were not previously known north of Florida. (H. M. SMITH.)

**Muraena retifera** Goode & Bean. *Moray.*

Described from the coast of South Carolina in deep water, and heretofore known only from that locality. A specimen taken in a lobster pot near Tuckernuck Island on July 25, 1899, measured 6 feet 2 inches in length, 18 inches in circumference, and weighed 39 pounds. This huge eel was subsequently exhibited in New Bedford as a "sea serpent." It was identified by Dr. H. C. Bumpus.

**Holocentrus**, sp. *Squirrel-fish.*

A young squirrel-fish, differing from the common Florida and West Indian species, *H. ascensionis*, and apparently representing one of Poey's imperfectly described Cuban species, was taken in Katama Bay on September 1. There is no other record of the occurrence of a squirrel-fish north of Florida.

**Apogon maculatus** (Poey). *King-of-the-Mullets.*

This species has been recorded from Florida, the West Indies, and Brazil. It is not rare on the Snapper Banks off the west Florida coast, and has frequently been found in the stomachs of snappers and groupers. There is no record of its occurrence anywhere on our coast north of Key West, although a related species, *Apogon imberbis* (Linnaeus), was once reported from Newport, R. I., by Cope. On September 1, 1899, 6 specimens were taken at one seine-haul in Katama Bay, and on September 16 5 more were caught at one set at the same place.

**Epinephelus morio** (Cuvier & Valenciennes). *Red Grouper.*

This well-known Florida and West Indian food-fish is known from Virginia, and was also recorded from New York by the describers and by De Kay, although no one since the latter's time has reported it so far north, and he himself relied on the testimony of fishermen. The detection of the fish in the vicinity of Woods Hole in 1899 is now announced, 5 specimens being taken in Katama Bay on September 1, and 2 on September 16; these were all young, from 3 to 4 inches in length.

**Epinephelus ascensionis** (Osbeck). *Rock Hind.*

Previously known range, Florida Keys to Brazil, Ascension Island, and St. Helena Island. One small example was taken by the Fish Commission in Katama Bay on September 19, 1899.

**Garrupa nigrita** (Holbrook). *Black Jew-fish.*

A number of small specimens found during September in company with *Epinephelus niveatus* and bearing a remarkable superficial resemblance to that species, are with some hesitation identified as the black jew-fish, the young of which is undescribed. The species ranges from South Carolina to Brazil.

**Eupomacentrus leucostictus** (Müller & Troschel). *Cockey-pilot.*

The hitherto known range of this species, which was described from the Barbadoes in 1848 in Schomburgk's history of that island, was the West Indies to Key West and the west coast of Florida. Between August 30 and October 4, 1899, 9 small specimens of uniform size were taken on five different days in Katama Bay.

**Teuthis hepatus** Linnaeus. *Surgeon-fish; Tang; Lancet-fish.***Teuthis oceruleus** (Bloch & Schneider). *Blue Surgeon; Blue Tang.***Teuthis bahianus** (Castelnau). *Barbeiro.*

These three species are recorded from Florida, the West Indies, and Brazil; the first has been taken as far north as Charleston, S. C. During August, September, and October, 1899, all of them were found in some numbers in Katama Bay, and about 50 were obtained on seven different occasions. The last were secured on October 4, when the three species were represented in one seine-haul. About half the specimens are referable to the common species (*T. hepatus*). All are small, although those last taken exhibit a slight increase in size compared with those caught early in September.

**Mycteroperca bonaci** (Poey). *Marbled Rock-fish; Black Grouper.*

This fish is known from the west coast of Florida and about Key West, whence its range extends through the West Indies to Brazil. One specimen, 5 inches long, was seined in Katama Bay on September 19, 1899.

**Mycteroperca interstitialis** (Poey).

Ten specimens of a small grouper were obtained in Katama Bay in September and October. They are apparently referable to this species, known only from Cuba, but may be the young of some other species.

**Lactophrys triqueter** (Linnæus). *Trunk-fish.*

This fish inhabits the West Indies, Florida, and the Bermudas, but has not been previously reported from Massachusetts, although the common trunk-fish, *Lactophrys trigonus* (Linnæus), has been known from the region for many years and is taken at Woods Hole every season. A number of small specimens of *L. triqueter* were obtained in 1899; several collected in 1897 and earlier years had been identified as *L. trigonus*.

**Lactophrys tricornis** (Linnæus). *Trunk-fish; Cow-fish.*

This widely distributed species has been reported as far north on our coast as Chesapeake Bay, whence its range extends to the Gulf of Mexico, West Indies, Brazil, and west Africa. Its occurrence in the Woods Hole region, in company with the following species, was noted for the first time in September, 1899, when it was found on four or five occasions in Katama Bay. All of the specimens were small. On November 6, 1899, a fish 15½ inches long was washed ashore at Cuttyhunk.

**Scorpæna plumieri** Bloch. *Scorpion-fish.*

This species, which is common from the Florida Keys to Brazil, has not been recorded north of Key West. On seven days in August, September, and October, 1899, the fish was found at Woods Hole, and 20 small specimens were taken.

**Scorpæna grandicornis** Cuvier & Valenciennes. *Scorpion-fish; Lion-fish.*

The normal range of this species is southern Florida to South America, in shallow water. One small example was secured in Katama Bay on September 29.