

42.—REPORT ON THE FISHES OBSERVED IN GREAT EGG HARBOR BAY, NEW JERSEY, DURING THE SUMMER OF 1887.**By TARLETON H. BEAN.***Ichthyologist, U. S. Fish Commission.*

In the summer of 1854 Prof. Spencer F. Baird, then Assistant Secretary of the Smithsonian Institution, spent a period of six weeks on the coast of New Jersey, principally at Beesley's Point and Long Island, New York, "studying the habits and distribution of the principal species of fishes that are known on that portion of our shores during the summer." Professor Baird took 67 species, and in his report to the Secretary of the Smithsonian Institution, which was printed in the Ninth Annual Report of the Institution for 1854, he gives descriptions of colors taken from the fresh and living fish, notes on the natural history and distribution of many of the economic species, and the vernacular names employed by the fishermen of the bay. He gives, also, a description of the physical features of the region explored. In this report the following new species are described: *Pomotis chatodon*, *Centrarchus pomotis*, *Lobotes emarginatus*, *Eucinostomus argenteus*, *Hydrargyra lucia*, and *Cyprinodon parvus*, all of which, except one, are still regarded as valid.

This was the first systematic account of marine fishes made by Professor Baird, and it is the only one of the kind which has emanated directly from his pen. It was here that he originated the methods of observation of marine fishes which were long afterwards applied in his greater researches on behalf of the United States Government into the causes of the decrease of food-fishes and their propagation in the waters of the United States.

In the spring of 1887 Professor Baird expressed a desire to have the writer undertake a new exploration of the waters of Great Egg Harbor Bay with the view of discovering what changes had taken place in the fauna during the long interval since 1854. In accordance with this wish I was directed to go to that region in July, 1887, to make collections and observations. Finding that Beesley's Point is remote from railroads and without telegraphic communication I decided to make my headquarters at Somers Point, on the opposite side of the bay and several miles distant. I was assisted in my work by Mr. L. M. McCormick, of Oberlin College, Ohio, who remained at Somers Point from August 20 to September 9. I am indebted also to Mr. Bolton E. Steelman, whose skill in navigation and in the details of fishing aided me materially.

The localities mentioned by Professor Baird, with one or two exceptions, notably the Cedar Swamp Creeks and Corson's Inlet, were visited by us many times during our seining trips, which were continued during all of August and the first half of September. We had no interruptions on account of bad weather. Our seines proved effective in taking 86 species. It would have been better, however, had we taken with us a seine of 60 or 70 fathoms in length and about 15 feet deep in the bag. Our largest seine, 20 fathoms long, greatest depth 10 feet, proved too small for the capture of skates, sting rays, and sharks.

There have been many changes in the bay since 1854. One of the ocean inlets which was then navigable for moderately large vessels is now closed and its site is occupied by the town of Longport. New islands have formed, channels have shifted, and the number of algæ has apparently increased.

Some of the species found in abundance by Professor Baird were not seen by us and upwards of 30 species which were not recorded in his report we found during the last summer. The sheephead was not taken in 1854; it is not abundant now, but adults are occasionally caught with the hook, and the young were found in moderately large numbers by us at Beesley's Point. On the other hand, young drum were found to be abundant by Professor Baird, but the species was not obtained by us. The young *Lutjanus* is another species which we did not see at all.

Following is a complete list of the species which are recorded by Professor Baird and not obtained by us: *Chilomycterus fuliginosus*, *Ophidium marginatum*, *Pogonias chromis*, *Lutjanus griseus*, *Enneacanthus obesus*, *Mesogonistius chætodon*, *Esox americanus*, *Fundulus lucia*, *Opisthonema oglinum*, *Aleurichthys marinus*, and *Reniceps tiburo*.

Ophidium marginatum does not occur in the bay in summer. *Cottus octodecimspinosus* has been taken in November. *Pogonias chromis* is still taken occasionally by the purse-seiners in the ocean near by. We made special effort to find *Fundulus lucia* in the ditches at Robinson's Landing, near Ocean City, but the extensive changes in the drainage system of Peck's Beach seem to have driven away that species. *Opisthonema oglinum* still inhabits the region and will doubtless be found again. The sea catfish, *Aleurichthys marinus*, seems to be unknown to the fishermen, and the only "shovel-nose shark" recognized now is not the true shovel-nose, but *Sphyrna zygaena* instead.

Other young fishes obtained by me are the following: *Astroscopus anoplus*, *Elacate canada*, *Orthopristis chrysopterus*, *Sphyrna picuda*, and *Tylosurus gladius*. Some of these have not previously been described.

Lagocephalus lavigatus, *Hippocampus punctulatus*, and *Fistularia tabaccaria* were found to be moderately common. *Menidia laciniata* was found abundant.

A day or two before my arrival at Somers Point, a cargo of 40,000 mackerel was landed there. These were taken by one of the menhaden steamers in the vicinity, and a few days later a fishing schooner took

10,000 off Squan, N. J. The mackerel landed at Somers Point proved to be *Scomber pneumatophorus*, and the catch off Squan was also reported to be "thimble-eye mackerel." Observation and inquiry into the occurrence of mackerel off this portion of the coast in July and August lead me to believe that *Scomber pneumatophorus* is the species taken at that period, and that *Scomber scombrus* probably does not occur so late in the summer.

Great Egg Harbor Bay has neither pounds nor traps. Seines were used during our stay, but this is contrary to law. Two factories for the making of fertilizers from the menhaden are located in this region. Three menhaden steamers make this bay their headquarters. They reported a fair catch of fish up to the middle of September, after which my investigations closed.

Fishing with hand-lines is very satisfactory. Large catches of weakfish and kingfish are made in this way during the summer. Gill-nets are used in winter, the principal yield being white perch. Shortly after the 1st of September the fish-eating birds disappeared suddenly and the fishing dropped off. At the time of my departure, September 21, the only good catches of weakfish were made in the ocean adjacent to the bay.

An attempt was made to use the trawl-line in the channels, but it was found to be unserviceable on account of the great masses of floating algæ with which the hooks became invested.

FISHES OF GREAT EGG HARBOR BAY, NEW JERSEY.

Species taken in 1887.	Species taken in 1851.
1. <i>Chilomycterus geometricus</i>	<i>Chilomycterus geometricus</i> .
2.	<i>Chilomycterus fuliginosus</i> .
3. <i>Tetrodon turgidus</i>	<i>Tetrodon turgidus</i> .
4. <i>Lagocephalus lavigatus</i>	
5. <i>Monacanthus hispidus</i>	
6. <i>Alutera schepfli</i>	
7. <i>Siphostoma fuscum</i>	<i>Siphostoma fuscum</i> .
8. <i>Hippocampus punctulatus</i>	
9. <i>Achirus mollis</i>	<i>Achirus mollis</i> .
10. <i>Citharichthys microstomus</i>	
11. <i>Pleuronectes americanus</i>	<i>Pleuronectes americanus</i> .
12. <i>Paralichthys dentatus</i>	<i>Paralichthys dentatus</i> .
13. <i>Bothus maculatus</i>	<i>Bothus maculatus</i> .
14.	<i>Ophidium marginatum</i> .
15. <i>Batrachus cau</i>	<i>Batrachus tau</i> .
16. <i>Astroscopus anoplus</i>	
17. <i>Gobiosoma bosc</i>	<i>Gobiosoma bosc</i> .
18. <i>Prionotus strigatus</i>	
19. <i>Prionotus palmipes</i>	<i>Prionotus palmipes</i> .
20. <i>Cephalacanthus volitans</i>	
21. <i>Cottus octodecimspinosus</i>	<i>Cottus octodecimspinosus</i> .
22. <i>Sparisoma</i>	
23. <i>Tautoga onitis</i>	<i>Tautoga onitis</i> .
24. <i>Ctenolabrus adpersus</i>	
25. <i>Gerres argenteus</i>	<i>Gerres argenteus</i> .
26. <i>Chætodon maculocinctus</i>	
27. <i>Sarda sarda</i>	
28. <i>Scomberomorus maculatus</i>	<i>Scomberomorus maculatus</i> .
29. <i>Scomber pneumatophorus</i>	
30. <i>Caranx hippos</i>	<i>Caranx hippos</i> .
31. <i>Seriola zonata</i>	
32. <i>Selene gallus</i>	<i>Selene gallus</i> .
33. <i>Trachynotus rhomboides</i>	<i>Trachynotus rhomboides</i> .
34. <i>Trachynotus carolinus</i>	<i>Trachynotus carolinus</i> .
35. <i>Poronotus triacanthus</i>	<i>Poronotus triacanthus</i> .

FISHES OF GREAT EGG HARBOR BAY, NEW JERSEY—continued.

Species taken in 1887.	Species taken in 1854.
36. <i>Cynoscion regale</i>	<i>Cynoscion regale</i> .
37. <i>Menticirrhus saxatilis</i>	<i>Menticirrhus saxatilis</i> .
38. <i>Menticirrhus alburnus</i>	
39. <i>Liosotomus xanthurus</i>	<i>Liosotomus xanthurus</i> .
40. <i>Bairdiella chrysaurea</i>	<i>Bairdiella chrysaurea</i> .
41.	<i>Pogonias chromis</i> .
42. <i>Stenotomus chrysops</i>	<i>Stenotomus chrysops</i> .
43. <i>Archosargus probatocephalus</i>	
44. <i>Lagodon rhomboides</i>	
45. <i>Orthopristis chrysopterus</i>	
46.	
47. <i>Acantharchus pomotis</i>	<i>Lutjanus griseus</i> .
48.	<i>Acantharchus pomotis</i> .
49.	<i>Enneacanthus obesus</i> .
50. <i>Centropristis furvus</i>	<i>Mesogonistius chactodon</i> .
51. <i>Boleosoma olmstedii</i>	<i>Centropristis furvus</i> .
52. <i>Boleichthys fusiforme</i>	
53. <i>Roccus americanus</i>	<i>Boleichthys fusiforme</i> .
54. <i>Roccus lineatus</i>	<i>Roccus americanus</i> .
55. <i>Elacate canadæ</i>	<i>Roccus lineatus</i> .
56. <i>Pomatomus saltatrix</i>	
57. <i>Aphredoderus sayanus</i>	<i>Pomatomus saltatrix</i> .
58. <i>Sphyræna borealis</i>	<i>Aphredoderus sayanus</i> .
59. <i>Sphyræna picuda</i>	<i>Sphyræna borealis</i> .
60. <i>Mugil curema</i>	
61. <i>Mugil albula</i>	<i>Mugil curema</i> .
62. <i>Menidia notata</i>	
63. <i>Menidia lacininata</i>	<i>Menidia notata</i> .
64. <i>Apeltes quadracus</i>	
65. <i>Fistularia tabaccaria</i>	<i>Apeltes quadracus</i> .
66. <i>Tylosurus marinus</i>	
67. <i>Tylosurus gladius</i>	<i>Tylosurus marinus</i> .
68. <i>Hemirhamphus roberti</i>	
69. <i>Esox reticulatus</i>	<i>Esox reticulatus</i> .
70.	<i>Esox americanus</i> .
71. <i>Melanura pygmæa</i>	<i>Melanura pygmæa</i> .
72. <i>Fundulus majalis</i>	<i>Fundulus majalis</i> .
73.	<i>Fundulus luciae</i> .
74. <i>Fundulus heteroclitus</i>	<i>Fundulus heteroclitus</i> .
75. <i>Fundulus diaphanus</i>	<i>Fundulus diaphanus</i> .
76. <i>Cyprinodon variegatus</i>	<i>Cyprinodon variegatus</i> .
77. <i>Lucania parva</i>	<i>Lucania parva</i> .
78. <i>Synodus fetens</i>	<i>Synodus fetens</i> *
79. <i>Etrumeus teres</i>	<i>Etrumeus teres</i> .
80. <i>Clupea æstivalis</i>	
81. <i>Clupea mediocris</i>	<i>Clupea mediocris</i> .
82. <i>Brevoortia tyrannus</i>	<i>Brevoortia tyrannus</i> .
83.	<i>Opisthonema oglinum</i> .
84. <i>Stolephorus mitchilli</i>	
85. <i>Stolephorus browni</i>	<i>Stolephorus browni</i> .
86. <i>Stolephorus eurystole</i>	
87. <i>Erimyzon oblongus</i>	<i>Erimyzon oblongus</i> .
88. <i>Catostomus teres</i>	
89. <i>Notemigonus chrysoleucus</i>	<i>Notemigonus chrysoleucus</i> .
90. <i>Amiurus natalis</i>	
91.	
92. <i>Conger conger</i>	<i>Ælurichthys marinus</i> .
93. <i>Anguilla rostrata</i>	<i>Conger conger</i> .
94. <i>Raja eglanteria</i>	<i>Anguilla rostrata</i> .
95. <i>Raja lævis</i>	
96. <i>Trygon hastata</i>	<i>Trygon hastata</i> .
97. <i>Myliobatis fremenvillei</i>	
98. <i>Sphyrna zygaena</i>	
99.	
100. <i>Carcharias obscurus</i>	<i>Reniceps tiburo</i> .
101. <i>Mustelus canis</i>	<i>Carcharias obscurus</i> .
	<i>Mustelus canis</i> .

1. *Chilomycterus geometricus*. (Mitchill). Cucumber-fish.

Diodon maculato-striatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 351.

A young example, 3 inches long, was seined at Longport August 29. This is much less elongate than the adult and has the orbital tentacles greatly developed. The black spot which is present near the anal origin in the adult is absent in the young.

A large individual, 8 inches long, was given to me by Mr. Charles Clements, August 29; it was caught on a hook in the bay. The species is known as the the "Cucumber-fish" at Somers Point.

2. *Chilomycterus fuliginosus* (De Kay).

Diodon fuliginosus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 351.

Professor Baird records the capture of a few specimens in Great Egg Harbor River by means of a seine.

We searched diligently in the same locality, but failed to find the species.

I have not been able to discover the Beesley's Point examples in the National Museum.

3. *Tetrodon turgidus* (Mitchill). Toadfish.

Tetraodon turgidus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 352.

The young are abundant everywhere about the shores of the bay. Numerous specimens were taken in the seine at Ocean City August 1, and at Beesley's Point August 10 and 11. Adult examples were several times caught on hooks baited for larger species. Two large specimens were seined in the grass at Beesley's Point August 10.

This species, called "toadfish" at Somers Point, has the same habit as *Lagocephalus lævigatus* of inflating itself by means of air or water at will. By some persons it is considered excellent for eating.

4. *Lagocephalus lævigatus* (Linn.).

An individual $4\frac{3}{4}$ inches long was seined by Andrew Jeffries at Somers Point, August 27.

Two examples, one of which is 6 inches long, were seined in a thoroughfare near Somers Point, August 30.

A specimen 7 inches long was caught on a hook by Rees Boise, September 2.

An individual 6 inches long was caught on a hook September 4.

Two were seined at Beesley's Point, September 9; these are 6.3 and 7 inches long.

Four more were caught at the same place, September 10; these vary in length from 6 to $6\frac{1}{2}$ inches.

One was hooked by Silas Boise, September 16, and another was caught in the same way on the 18th from one of the wharves.

This fish inflates its abdomen by pumping in air or water at will. It is unknown to the fishermen.

5. *Monacanthus hispidus* Linnæus.

Two individuals were caught in the seine at Ocean City, August 1. The larger is $3\frac{1}{2}$ inches and the smaller $1\frac{3}{4}$ inches long. D. I, 33; A. 33.

Two examples were caught in a thoroughfare near Somers Point, August 30.

Another one was seined at Beesley's Point, August 23. This one has several parasites attached to the fins.

6. *Alutera schœpffi* Walbaum. Sunfish.

Found sparingly about the shores; no adults seen. Young examples were taken at Ocean City, August 1, and at Beesley's Point, August 11.

At Beesley's Point, September 10, an example $9\frac{3}{4}$ inches long was taken. Seiners occasionally catch this fish, and it may be found lying on the beach where the seines are landed.

The name "sunfish" is sometimes applied to this species at Somers Point.

7. *Siphostoma fuscum* Storer. Billfish.

Syngnathus viridescens BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 351.

Males, females, and young were abundant at Ocean City, August 4. The egg-pouches of the males are filled with eyed embryo, arranged in four series on each side.

The species was abundant August 1, also, at the same place. It is common everywhere, and both sexes occur, but the males are more numerous than the females.

A male $6\frac{1}{2}$ inches long, taken near Ocean City, August 31, has the pouch unsymmetrically filled, the left side containing more than two-thirds of the whole quantity of embryos and increasing in carrying capacity from behind forward.

This is called "billfish" at Somers Point.

8. *Hippocampus punctulatus* Guichenot. Horsefish.

Two males and three females were seined at Ocean City, August 1.

The pouches of the males are much enlarged, but not yet dehiscent. Dorsal of the ♀ with a yellow margin; of the ♂ with orange. In both sexes there is a submarginal dark band. A dark blotch at top of anterior dorsal rays in both sexes. Cirri more developed in one of the females than in any of the other examples. One of the males has body rings vertically striped with narrow, dark brown stripes. All have several linear stripes obliquely across opercles from eye, and usually two on the neck. Abdominal edge dark. One female has wider stripes on the throat, converging behind, flanked in front by a few irregular dark blotches, and behind by four interrupted lines. White punctulations most numerous posteriorly.

August 23, 6 adult specimens, 2 of them males, were seined in one of the thoroughfares in the bay. The pouches of the males are well distended with embryos.

August 31, 4 adults, 2 males and 2 females, were seined in a thoroughfare near Ocean City. The males had the pouches fully distended. Both sexes have cirri greatly developed.

A male seined at Somers Point, September 5, has the pouch empty and the anal fin well developed; the cirri are all absent also.

9. *Achirus mollis* Mitchell.

Achirus mollis BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 350.

No young examples have been taken, and the adults are not common. Specimens were seined at Ocean City, August 1, and at Beesley's Point,

August 10 and 11. One was caught at Somers Point, July 29. The species was observed to be rather more abundant near Great Egg Harbor River than in other parts of the bay.

10. *Citharichthys microstomus* Gill.

Four examples were seined at Ocean City, August 1. D. 74; A. 55; scales, 41-42.

One of these, a specimen about 3 inches long, is dextral; all the rest are sinistral, as usual. I have not seen a dextral example before.

Young examples were seined, August 13, at Somers Point.

We find the species everywhere in moderate numbers. One was caught at Ocean City, August 25. In a thoroughfare near Ocean City, August 31, we took some large individuals, and smaller ones were moderately abundant; the largest is $4\frac{1}{2}$ inches long.

Examples from 2 to $2\frac{1}{2}$ inches long were caught at Beesley's Point, September 10.

11. *Pleuronectes americanus*. Walbaum. Winter flounder.

Platessa plana BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 349.

Half-grown and young individuals were seined at Ocean City, August 4. Other examples were seen at Beesley's Point a week later.

Young examples were found abundant in thoroughfares near Somers Point, August 30. From this time forward to the middle of September we seined the "winter flounder" in small numbers, but took no adults.

12. *Paralichthys dentatus* (Linnæus). Summer flounder.

Platessa ocellaris BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 349.

Small and large individuals were seined at Ocean City, August 1. The species is common everywhere, but no very young examples were seen. It takes the hook freely and is prized for food.

The gill-rakers are uniformly 20 or 21 in our specimens.

The species is known at Somers Point as the "summer flounder."

13. *Bothus maculatus* (Mitchill). Window-light.

Rhombus maculatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 350.

A single small example of the "window-light" was seined by Capt. Thomas Steelman of the menhaden steamer *Nellie Rawson*. We have not found the species in the bay, notwithstanding diligent search made for it. Professor Baird found it occasionally in the surf in 1854.

14. *Ophidium marginatum* De Kay.

Ophidium marginatum BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 351.

This species was not taken by Professor Baird in summer; his specimen, which is still preserved in the National Museum, was taken during the winter of 1853-'54 by Mr. Chatten.

15. *Batrachus tau* Linnæus. Oyster-fish.

Batrachus variegatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 340.

Seined at Ocean City, August 1, and everywhere about the shores. It is particularly common at Beesley's Point, near the river mouth.

Anglers for weakfish frequently catch the toadfish instead, much to their disgust. No very young examples have been seen. The species is usually called "oyster-fish" at Somers Point.

16. *Astroscopus anoplus* Cuv. and Val. (Pl. I, figs. 1 and 2.)

A single young individual, 1 inch long, was seined at Ocean City, August 1. The species has not previously been recorded from this bay.

Another example, 2½ inches long, was caught at Longport, August 26, not far from the inlet. The colors of the specimen, August 28, are as follows: Top of head, cheeks, sides, and a narrow strip along dorsal bases, plum color; back, olive; lower part of head, belly, ventrals, anal, and soft dorsal, whitish; caudal, pale, with a faint yellow blotch at base and a dusky streak on middle portion; spinous dorsal, black; chin with a yellow T-shaped marking, the stem of the T bounded on each side by a wing-shaped blotch of purple, which has a dark inner edge; pectoral, plum color, its lower margin whitish. D. IV, 14; A. 13. A prominent anal papilla. A low fold of skin extends from the ventrals along the median line of the belly to the anal papilla. Two slight furrows between the eyes, with two rows of papillæ along their inner margins. Behind these furrows are naked spaces, little developed, but quite distinct. Nostrils surrounded by a row of papillæ.

17. *Gobiosoma bosci* (Lacépède).

Gobius alepidotus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 339.

Three individuals were taken in the seine at Somers Point (Lousy Harbor), August 13. This species was found by Professor Baird rarely at Beesley's Point in 1854. It is common in Great South Bay, Long Island, and in Buzzard's Bay.

Two examples were seined in a thoroughfare near Somers Point, August 30.

Several specimens were seined, September 16, in ditches at Robinson's Landing, Ocean City, in company with *Fundulus*, *Cyprinodon*, *Lucania*, *Menidia*, *Mugil*, *Bairdiella*, *Anguilla*, and hosts of shrimp.

18 *Prionotus strigatus* Mitchill. Flying-fish.

Young specimens were seined at Beesley's Point, August 10. A single adult was given to me, August 13, by Capt. Frank Steelman. This was caught on a hook in the bay.

Young examples were taken again at Beesley's Point, September 9.

19. *Prionotus palmipes* Storer. Flying-fish.

Prionotus pilatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 327.

Common everywhere. This species is readily distinguished from the striped sea robin by its black branchiostegal patch and the absence of lateral stripes.

The species is known at Somers Point as the "flying-fish."

20. *Cephalacanthus volitans* (Linnæus).

A single example, 2½ inches long, was seined at Ocean City, August 1.

A second specimen, $6\frac{1}{2}$ inches long, was seined in a thoroughfare near Ocean City, August 31.

Another example, 7.7 inches long, was taken at Beesley's Point, September 9.

21. *Cottus octodecimspinosus* Mitchill.

Acanthocottus virginianus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 328.

This species does not come into Great Egg Harbor Bay in summer. Professor Baird's dried specimen was secured by Mr. Ashmead in winter.

A fine, large example, 12 inches long, was caught at Somers Point in November, and presented to the Museum by Mr. W. H. Keates.

22. *Sparisoma* sp.

A small individual of a species of *Sparisoma*, 2.1 inches long, was taken in the seine, September 15, near the mouth of Lousy Harbor, Somers Point.

Colors after immersion in alcohol over night: Body, greenish olive, except on abdomen and under surface of head, which are whitish, washed with yellow; dorsal, anal, and pectoral fins, pink, speckled with brown; a broad, light-brown stripe on tip of lower jaw; two similar stripes on cheeks, one of which extends from below the eye obliquely downward and forward; caudal with four badly-defined brown cross-bands; a pale band along the median line and another on the lateral line.

Scales, $2\frac{1}{2}$ -24-6.

Teeth ankylosed, but with free conical tips in both jaws. Gill-membranes attached to the isthmus.

23. *Tautoga onitis* (Linnæus). Smooth blackfish. (Pl. III., fig. 3.)

Tautoga americana BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 340.

Two individuals were taken on hand-line at Somers Point, August 8, with fiddler-crab bait. The larger example was about 10 inches long and the smaller about 7 inches.

The young are abundant at Beesley's Point and at Somers Point. Many examples were caught at Beesley's Point, August 10 and 11, the smallest being 1 inch long. Large individuals are taken with hooks in company with *Centropristis* and *Archosargus* in the vicinity of submerged wrecks.

The species is called "smooth blackfish" at Somers Point.

24. *Ctenolabrus adspersus* (Walbaum). Bengal.

A single example, $4\frac{1}{2}$ inches long, was seined at Beesley's Point, August 11, in the grass near the river mouth. The species is called "bengal" at Somers Point, probably a corruption of bergall.

The young were found near the boat-landing at Somers Point, August 20. An example, $1\frac{2}{3}$ inches long, was seined at Beesley's Point, August 23.

An individual, $3\frac{1}{2}$ inches long, was seined in a thoroughfare near Somers Point, August 27, in a muddy hole.

An example, 5 inches long, was seined at Beesley's Point, September 9, and numerous individuals were obtained at Somers Point, September 16.

25. *Gerres argenteus* (Baird & Girard).

Eucinostomus argenteus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 335.

Numerous young individuals were seined at Beesley's Point, August 10 and 11, and near Somers Point, August 13. No adults were taken.

The young were obtained again at Ocean City, August 16.

The species is found almost everywhere. We took it, August 27, in a muddy hole in one of the thoroughfares near Somers Point.

26. *Chætodon maculocinctus* (Gill). (Pl. I., fig. 4.)

A single individual, 1½ inches long, was taken in the seine at Beesley's Point, September 2.

The general color of the sides was yellow, more persistent in alcohol on the ventral surface and caudal peduncle than elsewhere.

D. XIII, 20; A. III, 18; lateral line, 45; third and fourth dorsal spines equal, and as long as the head without the snout.

27. *Sarda sarda* (Bloch). Bonito.

A half-grown individual was caught off Ocean City by Capt. Thomas Steelman, of the menhaden steamer *Nellie Rawson*.

The species is known as "bonito" at Somers Point.

28. *Scomberomorus maculatus* (Mitchill).

Cybium maculatum BAIRD, Rep. Fish. N. J., 1855, 21; Ninth Ann. Rep. Smith. Inst., 1855, 335.

Professor Baird records two specimens taken during his stay at Beesley's Point, and states that the species was scarcely known to the fishermen. The species is occasionally met with by the menhaden seiners off this portion of the coast, but we failed to obtain a specimen in our seines.

A single specimen, 11¾ inches long, was caught in a purse-seine by Capt. Thomas Steelman, of the steamer *Nellie Rawson*, after my departure from Somers Point.

29. *Scomber pneumatophorus* De la Roche. Mackerel.

The Philadelphia Press, newspaper, of July 24, contains an account of the capture of about 50,000 mackerel by the menhaden steamer *A. Morris*, near Ocean City, July 19.

The Philadelphia Record, newspaper, of July 27, records the capture of 6,000 thimble-eye mackerel, July 25, by the fishing schooner *Peter Cooper*, off Squan, N. J.

Some of the mackerel caught by the steamer *A. Morris* were preserved in brine by W. B. Steelman. Upon examination I found them to be *S. pneumatophorus*. The species is said to arrive usually in August.

William Jeffries & Sons, dealers in fish and oysters, Indiana avenue, Atlantic City, stated to me that no mackerel have come into their market during the present summer from fishermen. The only catches they

know of are those made by the menhaden steamer *A. Morris*, and by a vessel off Squan. Last summer they were caught frequently.

30. *Caranx hippos* (Linnaeus).

Caranx chrysos BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 336.

An example, $3\frac{1}{2}$ inches long, was taken at Beesley's Point, August 11, 1887.

Caudal, yellow; basal half of elevated portion of anal, yellow; cheeks and lower half of sides also yellow; a black opercular spot, but none on pectoral; several narrow pale bars on sides; tip of elevated part of soft dorsal, dusky; membrane between dorsal spines, dusky; iris, copper color.

A second specimen, 4 inches long, was seined at Ocean City, August 16. This example when held in the hand made a sound resembling that produced by the young hogfish.

Two examples, $3\frac{1}{4}$ to $3\frac{3}{4}$ inches long, were seined at Beesley's Point, August 23. Still another, $6\frac{1}{4}$ inches long, and showing the black pectoral blotch, was taken at Longport, August 29; this one made a very distinct croaking sound when taken in the hands.

31. *Seriola zonata* (Mitchill). Shark's pilot.

A "shark's pilot," about 8 inches long, was caught off Longport, in August, by Capt. Thomas Steelman, of the steamer *Nellie Rawson*. The species was not found in the bay. After my departure Captain Steelman caught two more examples, the larger one measuring $10\frac{1}{4}$ inches.

32. *Selene gallus* (Linnaeus).

Argyreiosus capillaris BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 337.

Beesley's Point, August 10 and 11.

Silvery. Five golden bands on sides, one of which extends through the eye and below it half way to maxilla, or slightly farther. The second and third soon fade, persisting only above median line and at their lower extremities.

The example taken August 11 is 4 inches long; its longest first dorsal ray measures $6\frac{7}{8}$ inches; the other is 3 inches long, and has a filamentous spine measuring 5 inches.

Another individual was seined September 16

33. *Trachynotus rhomboides* (Bloch). (Pl. III., fig. 5.)

Lichia spinosa BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 336.

Five young individuals, from 1 inch to $1\frac{1}{4}$ inches long, were seined at Beesley's Point, August 10 and 11.

After immersion in alcohol several days the colors are the following: General color, silvery, thickly sprinkled with dusky; sides wholly or partly suffused with pink; ventrals and tip of anterior anal rays orange; dorsal and anal dusky, with a narrow, pale marginal band; caudal, milk white, the lower lobe faintly tinged with yellow; iris, pink.

The young were abundant again at Longport, August 26, in the surf. Several young, the largest $2\frac{1}{4}$ inches long, were seined at Beesley's Point, September 9.

An individual, $1\frac{1}{2}$ inches long, taken at Beesley's Point, September 2, was mainly silvery when seined, but on being placed in a small aquarium almost instantly became dark brown, the dorsal and anal nearly black. On the ventrals, the anal spines, and the anterior tip of the anal fin, the usual vermilion, shading into orange.

34. *Trachynotus carolinus* (Linn.).

Lichia carolina BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 335.

An example, $4\frac{1}{4}$ inches long, was seined in the surf at Longport, August 26, the only specimen seen up to that date.

Another individual, $5\frac{1}{4}$ inches in length, was seined at the same place, September 8.

35. *Poronotus triacanthus* (Peck).

Peprilus triacanthus BAIRD, Rep. Fish. N. J., 1855, 24; Ninth Ann. Rep. Smith. Inst., 1855, 338.

Professor Baird secured several specimens which were caught in a net at Corson's Inlet, and saw small schools swimming close to the steep banks. Although the species is known to the fishermen, and is said to be present in summer, we did not see a single individual.

Two examples were seined by Capt. Thomas Steelman, however, after my departure from Somers Point; these are from 6 to $8\frac{1}{2}$ inches long.

36. *Cynoscion regale* (Bl. Schn.) Weakfish. (Pl. II, fig. 6.)

Otolithus regalis BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 329.

The young are abundant everywhere. The smallest example seined is $1\frac{1}{2}$ inches long. Weakfish weighing 2 or 3 pounds are not often taken in the bay at this time; the average of the numerous individuals hooked is below 1 pound. Large fish are caught in April and May, but they are said to leave before the spawning season arrives. August 15, the catch of weakfish is very large, some boats taking 150 on a tide.

At this date, September 9, and for some days before, we have seen very few young weakfish. A single one, 4 inches long, was seined at Beesley's Point. The catch of weakfish in the bay has fallen off to nearly nothing. Two young, 3 inches long, were caught in a thoroughfare near the draw-bridge, September 10.

When the fishing ended in the bay it begun outside in the adjacent ocean. On the 19th of September one boat took 101, but all of them were small, the average weight being about one-third of a pound. On the same date a single example of *C. maculatus* was caught in the bay, at Jimmy's Island.

On September 20 the yield from three boats was 29, 103, and 150 weakfish. On the 21st a single boat containing two men brought in 200 fish, many of which were large.

37. *Menticirrhus saxatilis* (Bl. Schn.). Kingfish. (Pl. II, III, figs. 7 and 8.)
Umbrina alburnus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 331.

Numerous young examples were seined at Ocean City, August 1, and at Beesley's Point, August 10 and 11. They are abundant everywhere. The adults are plentiful also, especially near sand-bars.

Half-grown individuals were taken August 23 in one of the thoroughfares near Somers Point; these vary from $3\frac{1}{2}$ to $5\frac{1}{2}$ inches in length.

Two adults were caught at Longport, September 8. Half-grown individuals, $6\frac{1}{2}$ inches long, were seined at Beesley's Point, September 9 and 10. Anglers catch very few of this species now (September 10).

The name of this species at Somers Point is "kingfish."

38. *Menticirrhus alburnus* (Linnæus). Kingfish.

Apparently not common. The second example so far recognized by me as belonging to this species was caught with a hook in the bay, August 23; it is 12 inches long. D. X, I, 23; A. I, 7. The longest dorsal spine is one-half as long as the soft dorsal and two-thirds as long as the head.

This is known as "kingfish," and is apparently not recognized as a species distinct from *M. saxatilis* by the fishermen.

39. *Leiostomus xanthurus* Lacépède. Spot; Porgy.

Leiostomus obliquus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 329.

No very young specimens were seen. Half-grown and adult examples are everywhere common.

The species is sometimes called "porgy" at Somers Point, but the usual name is "spot."

40. *Bairdiella chrysur* (Lacépède). (Pl. I, fig. 9.)

Corvina argyroleuca BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 331.

None but young individuals were seen, the largest specimen measuring about $2\frac{1}{2}$ inches. The smallest is little more than 1 inch long. The species seems to be unknown to the fishermen. Beesley's Point is the favorite collecting ground for the silver perch. Numerous examples were seined there August 10 and 11.

An individual, $3\frac{1}{2}$ inches long, was seined in a muddy hole in one of the thoroughfares near Somers Point, August 27.

The largest example taken was seined in a thoroughfare near Somers Point, August 30; it is 7 inches long.

Another example of equal size was caught in the seine at Beesley's Point, September 9, and half-grown ones of about 4 inches were moderately numerous.

41. *Pogonias chromis* (Linn.).

Pogonias fasciatus BAIRD, Rep. Fish. N. J., 1855, 18; Ninth Ann. Rep., Smith. Inst., 1855, 332.

Professor Baird made the following remarks about the drum:

"The young fish of this species were found very abundantly during August in the small bays along the shore about Beesley's Point. Few

were seen in the rivers." Some of these are still preserved in the National Museum.

We did not find the species in the bay, but I saw scales of a large individual on one of the menhaden steamers.

42. *Stenotomus chrysops* (Linnaeus). Sea porgy.

Pagrus argyrops BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 333.

Young individuals were taken sparingly at Ocean City, August 1. Small ones are frequently caught in seines along shore and on hooks in the bay.

This is called "sea porgy" to distinguish it from the "spot," which is sometimes styled "porgy."

43. *Archosargus probatocephalus* (Walbaum). Sheepshead. (Pl III, fig. 10.)

At Somers Point, August 8, two specimens were taken on hand-lines with fiddler-crab bait. The larger weighed 8 pounds and the smaller 5. The sheepshead is not common. Fishermen say that small specimens are not seen. The fishing places are about wrecks, wharf piles, and under steep banks in the thoroughfares.

Sixteen specimens, from 1 inch to about $1\frac{1}{4}$ inches, were seined at Beesley's Point, August 10 and 11.

Seven black bars on sides, and an other faint, narrow one, atcaudal base; interspaces yellowish green.

August 15, two additional specimens were caught on hand-lines.

An example 2.1 inches long and four smaller were taken at Beesley's Point, August 23. Several more were seined September 2 at the same place.

Seven more were caught at Beesley's Point, September 9, the largest of these is 2.1 inches long.

The young are found only at Beesley's Point, and in only one limited shore stretch there. It is well supplied with algæ, and there are convenient hiding places under the sod banks.

44. *Lagodon rhomboides* (Linnaeus).

Young individuals, ranging from $3\frac{1}{4}$ to 4 inches in length, were taken at Beesley's Point, August 11. The species is not uncommon.

This fish is unknown to the fishermen.

Specimens were taken at Beesley's Point, September 9. The largest are about 5 inches long.

45. *Orthopristis chrysopterus* (Linnaeus). (Pl. III., fig. 11).

At Beesley's Point, N. J., August 10, 1887, many young individuals were taken in the seine. D. XII, 16; A. III, 13; scales, 75.

A dark stripe beginning on nape and dividing sends one branch along the back on each side not far from dorsal outline. A dark stripe from eye to root of caudal. Cheeks and opercles with several narrow orange stripes. A narrow orange stripe between the two dark body stripes and another below the lower dark stripe. Below the second orange stripe the sides are marked with numerous orange spots, not continu-

ous. These specimens are from less than 1 inch to more than 2 inches long.

Young examples were seined at Somers Point, August 13, and abundantly at Ocean City, August 16. The croaking sound made by these little fishes is quite noticeable.

September 5, Mr. W. S. Keates brought in two examples which had been caught on a hook with clam bait; these are $5\frac{1}{4}$ inches long, and much larger than the average size. Specimens from $4\frac{1}{2}$ to 5 inches long were caught at Beesley's Point, August 23; in these there is only a trace of the black lateral stripe along the median line, and the sides have several broad, dark bands.

September 9 an individual $5\frac{1}{3}$ inches long was taken at Beesley's Point. This species is unknown to the fishermen. One angler described its croaking as resembling the quacking of a duck.

46. *Lutjanus griseus* (Linn.).

Lobotes emarginatus BAIRD, Rep. Fish. N. J., 1855, 18; Ninth Ann. Rep. Smith. Inst., 1855, 332.

Professor Baird found a few specimens in August among the grass along the river. His largest examples were 3 inches long.

We did not observe the species during our stay.

47. *Acantharchus pomotis* (Baird).

Centrarchus pomotis BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 325.

A single small individual was seined in Gravelly Run, a tributary of Great Egg Harbor River, September 6. Its associates were *Aphredoderus sayanus*, *Melanura pygmaea*, *Fundulus diaphanus*, and young *Esox reticulatus*.

48. *Enneacanthus obesus* (Girard).

Pomotis obesus BAIRD, Rep. Fish. N. J., 1855, 10; Ninth Ann. Rep. Smith. Inst., 1855, 324.

Professor Baird obtained this species only in the Cedar Swamp creeks, Cape May County and Atlantic County, among the splatter docks or in small runs or ditches.

49. *Mesogonistius chætodon* (Baird).

Pomotis chatodon BAIRD, Rep. Fish. N. J., 1855, 10; Ninth Ann. Rep. Smith. Inst., 1855, 324.

Professor Baird found the banded sunfish "abundant in the muddy water of Cedar Swamp Creek, Cape May County."

50. *Centropristis furvus* (Walbaum.) Blackfish. (Pl. III., fig. 12.)

Centropristes nigricans BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 323.

Both the young and half-grown fish are excessively abundant throughout the bay. Examples scarcely more than 1 inch long are very common. Larger individuals are caught in the deep channels than in shoal water.

An example $1\frac{1}{2}$ inches long was the smallest one seen at Beesley's Point, September 9,

51. *Boleosoma olmstedii* (Sterer).

Seven examples were taken in Gravelly Run, September 6. For a list of its associates see *Notemigonus chrysoleucus*. D. IX, 15; A. I, 10; scales, 48.

This species was not observed by Professor Baird in 1854.

52. *Boleichthys fusiforme* (Girard).

Boleosoma fusiformis BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 328.

Four examples were seined in Gravelly Run, September 6, associated with *Boleosoma olmstedii*:

D. X, 12; A. II, 7; scales, 49; lateral line on 18.

53. *Roccus americanus* (Gmelin). Perch.

Labrax mucronatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 322.

Seined in large numbers at Beesley's Point, August 10 and 11, at the mouth of the river. Our examples are about 6 to 7 inches long. No young ones were taken.

In several of the salt water creeks emptying into the bay we seined great numbers of white perch on the last of the ebb tide. In salt water the species is called "yellow perch" by some of the fishermen; sometimes "perch" alone is used, and the pronunciation is changed as if the spelling were "peerch."

The principal fishery for white perch is by means of gill-nets in winter.

54. *Roccus lineatus* (Bloch). Rockfish.

Labrax lineatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 321.

Small individuals, 8 inches long, were seined in the mouth of the river at Beesley's Point, August 10. Examples weighing 2 or 3 pounds are being caught with the hook at Tuckahoe River mouth, about the middle of September.

This is the "rock" or "rockfish" of Somers Point.

55. *Elacate canada* (Linnæus.) (Pl. II, fig. 13.)

A young example, $3\frac{7}{8}$ inches long, was caught at Somers Point, near the club house, August 2, 1887, by Capt. Richard Chamberlain. Ground color nearly black; a white stripe, about as wide as pupil, from upper angle of gill-opening to caudal; another one, but narrower, begins at lower extremity of pectoral base, curves very slightly upward, fading out near the tail; upper caudal lobe, with a narrow whitish margin along its upper surface, relieved by a trace of orange red at its base; lower caudal lobe with a narrow orange-red margin; pectorals, ventrals, and caudal black; back fades to a dark green; belly, grayish white; iris, golden bronze.

This species has not previously been recorded from Great Egg Harbor Bay, and the young seems not to have been described.

Another example, 4 inches long, was seined in one of the thoroughfares in the bay, August 23. This has the same markings as the first.

The caudal, when fully expanded, is rounded, the end truncate; there is no emargination as in the adult.

56. *Pomatomus saltatrix* (Linnæus). Snap-mackerel.

Temnodon saltator BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 337.

Numerous young individuals, ranging from $1\frac{1}{2}$ to 6 inches long, are found at Ocean City, Beesley's Point, and elsewhere. Several examples about 1 foot long were caught on hooks August 13, and on the same day we seined several specimens about 8 inches in length. Large fish are not taken here at present.

Schools of the young fish were seen in the bay August 15 and 16.

At Ocean City, August 31, young examples from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long were seined.

At Ocean City the species is sometimes called "mackerel," but the usual appellation is "snap-mackerel" or "snapping-mackerel."

57. *Aphredoderus sayanus* (Gilliams).

Aphredoderus sayanus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 326.

Several examples were seined in Gravelly Run, a tributary of Great Egg Harbor River, September 6. For its associates see *Acantharchus pomotis*.

58. *Sphyræna borealis* De Kay.

Sphyræna borealis BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 326.

The young of this species, measuring 3 or 4 inches, was found abundant at Ocean City, August 1; also at Beesley's Point, August 10, where the smallest one observed is $2\frac{3}{8}$ inches long.

The barracuda is unknown to the fishermen.

59. *Sphyræna picuda* Bl. Schn. (Pl. II, fig. 14.)

A single young example, 2 inches long, was taken at Beesley's Point, August 23. Scales in about 81 rows.

As far as I know this is the first record of the appearance of the young on our coast.

60. *Mugil curema* Cuv. and Val. Mullet.

Mugil albula BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 339.

Small mullet were seined at Ocean City, August 1, at Beesley's Point, August 10 and 11, and at Somers Point, August 13. At the latter place an individual was seined in a salt pond in company with *Cyprinodon*, *Lucania*, *Fundulus*, and *Menidia*. The largest example measures $4\frac{7}{8}$ inches.

At Longport, August 29, some larger specimens were taken in the surf. The largest of these is $6\frac{1}{2}$ inches long. At Beesley's Point, September 2, specimens of equal size were caught.

61. *Mugil albula* Linnæus. Mullet.

Seven individuals, averaging about $7\frac{1}{2}$ inches in length, were seined at Ocean City, August 16. In this seine haul there was the greatest lot of young fishes that we have secured thus far—the young *Bairdiella*

was excessively abundant. *Fundulus majalis* and *heteroclitus*, *Menidia notata*, *Tetodon turgidus*, and *Mugil curema* were also plentiful. It is said that *Mugil albula* of large size is not taken here.

The species of *Mugil* are called "mullet" at Somers Point.

62. *Menidia notata* Mitchell.

Atherinopsis notatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 338.

Excessively abundant everywhere, the young schooling at the surface along shore and out in the bay. Small individuals were found in salt ponds, August 13, at Somers Point.

63. *Menidia lacinolata* Swain.

Sand bar in Great Egg Harbor Bay, August 23, six specimens, ranging from $2\frac{1}{2}$ to $3\frac{1}{4}$ inches in length.

Not previously recorded from the region.

The species was found again in abundance at Somers Point, August 25.

At Longport, August 26 and 29, the species was again met, and here an individual $4\frac{1}{2}$ inches long was taken, the largest one seen.

64. *Apeltes quadracus* (Mitchell).

Gasterosteus quadracus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 328.

Abundant at Beesley's Point, August 10 and 11. This species prefers the vicinity of fresh-water streams, where grass is plentiful.

65. *Fistularia tabaccaria* Linnæus.

Three individuals were seined at Ocean City, August 4, and one at Beesley's Point, August 11. This species can hardly be considered rare. It is frequently taken on Long Island and occasionally at Wood's Holl.

Another example was taken at Ocean City, August 16.

Six specimens were seined in thoroughfares near Somers Point, August 23, and eight more August 30.

A single individual was seined in a thoroughfare near Ocean City, August 31.

Three examples were seined at Somers Point, September 5, and two at Beesley's Point, September 9.

66. *Tylosurus marinus* (Bl. Schn.). Gar.

Belone truncata BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 346.

Young examples are common everywhere. A half-grown individual, about 18 inches long, was seined, August 10, at Beesley's Point.

The species is called "gar" at Somers Point.

67. *Tylosurus gladius* Bean. Gar. (Pl. II, fig. 15.)

A young example was seined at Ocean City, August 1. D. I, 21; A. I, 20. Length, $6\frac{1}{2}$ inches.

A dark cutaneous flap attached along the side of the mandible and folded underneath, meeting its fellow of the opposite side and concealing a small portion of the lower jaw. Dorsal black, except on the first six rays, which are pale; much elevated at the posterior part, where the

longest ray equals the distance from the middle of the eye to the end of the head.

Fourteen black blotches on sides not extending to caudal, the largest two-thirds as wide as length of eye. Paired fins, and anal pale. Caudal the same, except anterior half of upper lobe, on which the membrane covering the rays is black, while the intervals between the rays are pale. Back greenish; under surface, except mandibular flap, silvery.

This species has not previously been recorded in the region.

68. Hemirhamphus roberti Cuv. and Val. (Pl. III, fig. 16.)

A single young individual, $2\frac{1}{4}$ inches long, was seined at Longport, August 26. This species was not obtained by Professor Baird in 1854.

A fine example, $6\frac{1}{4}$ inches long, was taken in the seine at Beesley's Point, September 9. The crimson tip and membrane on lower jaw are very marked.

69. Esox reticulatus Le Sueur. Pike. (Pl. I, fig. 17.)

Esox reticulatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 346.

Half-grown and young examples were seined in Gravelly Run, September 6. The markings of these specimens resemble those of *E. lucius*, the reticulations being inconspicuous. For a list of its associates see under *Notemigonus chrysoleucus*.

This is the "pike" of Somers Point.

70. Esox americanus Gmelin.

Esox fasciatus BAIRD, Rep. Fish. N. J., 1855, 31; Ninth Ann. Rep. Smith. Inst., 1855, 345.

Professor Baird records this species from Cedar Swamp Creek, where it was abundant. He describes a specimen 10 inches long, but individuals of considerably larger size were taken.

71. Melanura pygmæa (De Kay).

Melanura pygmæa BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 342.

A single small individual was caught in Gravelly Run, Atlantic County, September 6. Its associates were *Acantharchus pomotis*, *Aphredoderus sayanus*; young *Erimyzon oblongus*, young *Esox reticulatus*, and *Fundulus diaphanus*.

72. Fundulus majalis (Walbaum).

Hydrargyra flavula BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 344.

Abundant everywhere along the shores and found in salt ponds associated with *Cyprinodon*, *Lucania*, and other genera.

73. Fundulus luciae (Baird).

Hydrargyra luciae BAIRD, Rep. Fish. N. J., 1855, 30; Ninth Ann. Rep. Smith. Inst., 1855, 344.

Professor Baird took a few specimens only in a small ditch at Robinson's Landing, Peck's Beach, opposite Beesley's Point. This place is now called Miller's Landing, and the drainage system has been greatly changed. Diligent search was made for the species, but without result.

Professor Baird's specimens were about 1 inch long. The dorsal of his examples had a large black spot posteriorly and immediately anterior to it a white one.

74. *Fundulus heteroclitus* (Linnæus).

Fundulus zebra BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 342.

Found everywhere with the preceding.

75. *Fundulus diaphanus* Le Sueur.

Fundulus diaphanus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 343.

Fundulus multifasciatus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 344.

Seined in Gravelly Run, September 6. Common.

76. *Cyprinodon variegatus* Lacépède.

Cyprinodon ovinus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 345.

Numerous examples were seined in salt ponds near Somers Point, August 13. Among them were some very large males. The species was associated with *Lucania*, *Fundulus*, *Menidia*, and *Mugil*.

A few examples were seined, September 16, in ditches near Ocean City. For its associates see under *Gobiosoma*.

77. *Lucania parva* (Baird and Girard). (Plate II, fig. 18.)

Cyprinodon parvus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 345.

Found abundantly in salt ponds near Somers Point, August 13.

Seined in small numbers in ditches near Ocean City, September 16. See *Gobiosoma* for a list of its associates.

78. *Synodus fœtens* (Linnæus).

Saurus mexicanus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 346.

Adults and young of this species are rather common in this region. Professor Baird found a single specimen only in 1854. The species is common also in Great South Bay, Long Island.

At Beesley's Point, September 2, 1887, a small individual was found to have swallowed a *Pleuronectes americanus*, which distended the stomach of its captor laterally to nearly twice its normal width.

Abundant in thoroughfares near Somers Point August 30. One individual taken is $7\frac{3}{4}$ inches long. Some very large ones have been seen; an example caught at Beesley's Point, September 9, is nearly 9 inches long, and we have secured some larger than this.

The species is unknown to the fishermen.

79. *Etrumeus teres* (De Kay).

Alosa teres BAIRD, Rep. Fish. N. J., 1855, 35; Ninth Ann. Rep. Smith. Inst., 1855, 349.

Professor Baird's remarks are as follows:

A number of specimens of this rare species were found one day in the edge of the surf along the beach; they seemed to be very weak, and died soon after their capture.

A single specimen, $5\frac{3}{4}$ inches long, was seined by Capt. Thomas Steelman after my departure from Somers Point.

80. Clupea æstivalis Mitchill. Herring.

Several examples, about $3\frac{3}{4}$ inches long, were seined near Somers Point August 13. This species was not observed by Professor Baird in 1854.

The young, ranging from 2 to 3 inches in length, were taken in abundance in Gravelly Run, September 6.

81. Clupea mediocris Mitchill. Herring.

Alosa mattowaca BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 349.

Heads of some individuals were picked up on the river beach near Beesley's Point, August 11.

August 23, near Beesley's Point, I found a perfect example, 11 inches long, lying on the shore, where it had been left by a seining party.

This species is known as "herring" at Somers point.

82. Brevoortia tyrannus (Latrobe). Bunker; Mossbunker; Menhaden.

Alosa menhaden BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 347.

August 8 and 9 numerous small schools and some large ones came into the bay. On the 8th sharks were among them. It is said that the menhaden do not often enter the bay.

August 13, again I saw many schools in the bay even well up as far as Beesley's Point. Sharks are reported plentiful among them.

August 23, near Beesley's Point, I saw several very large spoiled individuals lying on the shore, where they had been left by seiners.

September 10, in a thoroughfare near the draw-bridge (Beesley's Point), three large examples, 11 to 13 inches long, were taken in the seine; all of these were affected by lernæan parasites. Several young, under 4 inches long, were taken also.

83. Opisthonema oglinum (Le Sueur).

Chateausus signifer BAIRD, Rep. Fish. N. J., 1855, 35; Ninth Ann. Rep. Smith. Inst., 1855, 349.

Professor Baird's remarks are as follows:

A few specimens were taken in a net in the bay. In life the back is bright green; the caudal fin yellow, black at the tip.

84. Stolephorus mitchilli Cuv. and Val.

This anchovy was found in great abundance at Ocean City, August 1, and in small numbers at Beesley's Point, August 10 and 11. It is much more common near the ocean inlet, but is taken wherever the seine is hauled. No large examples have been seen thus far (August 18).

At Longport, August 27, specimens $3\frac{1}{2}$ inches long were seined in the surf.

At Somers Point, August 25, adults were present in moderate numbers.

85. Stolephorus browni (Gmelin).

Engraulis vittata BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 347.

Very large specimens, averaging about 5 inches in length, were seined at Longport August 26 and 27. On the latter date we took them by hundreds in the surf at the beginning of the flood. Weakfish were also

found there in abundance, feeding on these anchovies. We took 54 weakfish in two hauls of a 20-fathom seine.

The species was found sparingly also in a thoroughfare near Somers Point, August 30.

A few were seined again at Longport, September 8; the largest of these is nearly $5\frac{1}{2}$ inches long.

A few were taken at Beesley's Point, September 9, and on the following day the species was noted in a thoroughfare near the draw-bridge.

86. *Stolephorus eurystole* Swain & Meek. (Pl. III, fig. 19.)

Young individuals were seined at Ocean City, August 1. No adults have been seen.

Numerous young examples were taken at Longport, August 29, in the surf, associated with *S. mitchilli*.

87. *Erimyzon oblongus* (Mitchill). Chub sucker. (Pl. I, fig. 20.)

Catostomus gibbosus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 341.

The chub sucker was seined in large numbers of young and adults in Gravelly Run, September 6. For its associates see under *Notemigonus chryssoleucus*.

88. *Catostomus teres* (Mitchill). Sucker.

Two examples were seined in Gravelly Run, September 6. The species is called "sucker."

89. *Notemigonus chryssoleucus* (Mitchill). Roach.

Leucosomus americanus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 341.

The roach was found abundant in Gravelly Run, September 6. It was associated with *Erimyzon oblongus*, *Catostomus teres*, *Boleosoma olmstedii*, *Boleichthys fusiforme*, *Esox reticulatus*, *Fundulus diaphanus*, *Roccus americanus*, *Roccus lineatus*, young *Clupea astivalis*, and *Anguilla rostrata*.

90. *Amiurus natalis* (Le Sueur). Catfish.

Five specimens were obtained in Bargaintown Pond, August 19, by Mr. L. T. Imlay. The anal rays in all those examined were 27.

The species is known as "catfish."

91. *Ælurichthys marinus* (Mitchill).

Ælurichthys marinus BAIRD, Rep. Fish. N. J., 1855, 27, Ninth Ann. Rep. Smith. Inst., 1855, 341.

Professor Baird's record of this species is as follows:

The sea-cat or channel-cat was occasionally taken with the hook in the channel of the river. Nothing specially was learned of its habits. The flesh is very indifferent, being coarse and rank, tasting much like that of small sharks.

No specimens were taken during our stay at Somers Point.

92. *Conger conger* (Linn.). Sea eel.

Conger occidentalis BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 351.

Two skinned and headless examples were brought in to Somers Point by a fishing party September 4. One of these measured 21 inches. They are said to be common at Anchoring Point.

A perfect specimen was caught by Mr. Charles Clements, September 7, and presented to the collection.

Another fine individual was given to me by the same gentleman, September 9; it was caught at the wreck.

On the 18th of September another one was taken on a hook by Bolton E. Steelman.

This eel, known here as "sea eel," is taken not infrequently by anglers.

93. *Anguilla rostrata* (Le Sueur). Eel.

Anguilla tenuirostris BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 350.

A small example was seined at Ocean City, August 4, and a great many small and large were taken at Beesley's Point, near the river mouth, August 10 and 11.

The species was sufficiently common in salt water in most parts of the bay, and particularly about the salt marshes.

94. *Raia eglanteria* Lacépède. Skate.

A single example was obtained, August 28, at Somers Point. Several were caught with hooks, August 27, by fishing parties and thrown away.

95. *Raia lævis* Mitchell.

A decayed example, apparently of this species, was picked up at Beesley's Point, September 9, where it had been left by seiners. The teeth are in about 30 rows. There is a median row of strong spines on the tail, but no lateral rows on the portion remaining (part of the tail was cut off). The color is dark, and the snout does not seem to have been long enough for *lævis*, but the dentition fits nothing else.

96. *Trygon hastata* De Kay. Stingaree.

Pastinaca hastata BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 353.

Two small individuals were caught in a large seine at Ocean City, August 1. Anglers have caught several of them in the bay. An example weighing 30 or 40 pounds was reported by Captain Chamberlain August 13.

97. *Myliobatis freminvillei* (Le Sueur). Stingaree.

A single example of moderate size was caught in the inlet near Longport, August 29, by Mrs. Huston, who presented it to the National Museum collection.

Some of the crew of the menhaden steamer *Annie Morris* told me that about August 20, off Hereford Inlet, they saw schools of stingrays at the surface "flopping along like geese." The schools were large enough to fill a menhaden seine.

As the species was said to have two spines, I have placed the statement under *Myliobatis*.

98. *Sphyrna zygaena* (Linnaeus). Shovel-nose shark.

An individual, 25 inches long, was caught on a hook in the bay August 13, and another, 22 inches long, was given to me, August 16, by Silas

Boise. Still another small one was caught August 15. The species is often taken while fishing for weakfish. No large examples have been seen by me, but Captain Chamberlain reports one of 5 or 6 feet. This is the "shovel-nose shark" of the fishermen, although not the "shovel-nose" of the books.

The hammer head shark was not found by Professor Baird in 1854, but the true "shovel-nose" was common.

99. *Reniceps tiburo* (Linn.).

Zygena tiburo BAIRD, Rep. Fish. N. J., 1855, 39; Ninth Ann. Rep. Smith. Inst., 1855, 353.

Professor Baird obtained one specimen of this shark and the fishermen took several more. Singularly enough we failed to see this species, but the "hammer-head shark," which was not seen by Professor Baird, was taken frequently by us.

100. *Carcharias obscurus* (Le Sueur). Man-eating shark.

Carcharias caruleus BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 352.

Abundant in the bay. Young individuals, caught with hooks, July 29, and measuring $21\frac{1}{2}$ to 24 inches in length, still bear the umbilical scar. Examples 7 feet long have been seen. Recently, while the bay was visited by large schools of menhaden, sharks were unusually abundant.

This is the "man-eating shark" of Somers Point. A specimen weighing 150 pounds was reported July 23, and during the same week Charles Steelman landed one weighing 200 pounds.

101. *Mustelus canis* (Mitchill). Dog shark.

Mustelus canis BAIRD, Ninth Ann. Rep. Smith. Inst., 1855, 353.

Very common and very annoying to anglers. A small individual was seined at Ocean City, August 1. No adults have been observed.

This is known as "dog shark" at Somers Point.

U. S. NATIONAL MUSEUM,

Washington, December 8, 1887.

EXPLANATION OF PLATES.

PLATE I.

- Fig. 1. *Astroscoptes anoplus*, * p. 136.
 2. *Astroscoptes anoplus*, head, * p. 136.
 4. *Chetodon maculocinctus*, $2\frac{1}{2}$ times natural size, p. 138.
 9. *Bairdiella chrysaura*, † p. 141.
 17. *Esox reticulatus*, * p. 147.
 20. *Erimyzon oblongus*, * p. 150.

PLATE II.

6. *Cynoscion regale*, * p. 140.
 7. *Menticirrhus saxatilis*, $\frac{1}{2}$ natural size, p. 141.
 13. *Elacato canada*, $\frac{1}{2}$ natural size, p. 141.

Fig. 14. *Sphyrna plicuda*, † p. 145.

15. *Tylosaurus gladius*, $\frac{1}{2}$ natural size, p. 146.
 18. *Lucania parva*, † p. 148.

PLATE III.

3. *Tautoga onitis*, † p. 137.
 5. *Trachynotus rhomboides*, † p. 139.
 8. *Menticirrhus saxatilis*, † differing from fig. 7 in color, height of first dorsal, and length of snout, p. 141.
 10. *Archosargus probatocephalus*, † p. 142.
 11. *Orthopristis chrysopterus*, † p. 142.
 12. *Centropristis furvus*, * p. 143.
 16. *Hemirhamphus roberti*, * p. 147.
 13. *Stolephorus curystole*, † p. 150.

* Natural size.

† Twice natural size.

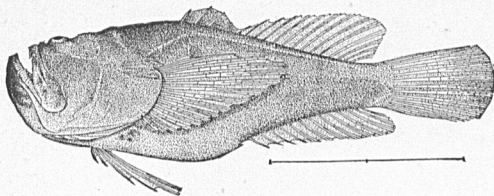


Fig. 1.

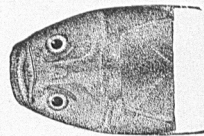


Fig. 2.

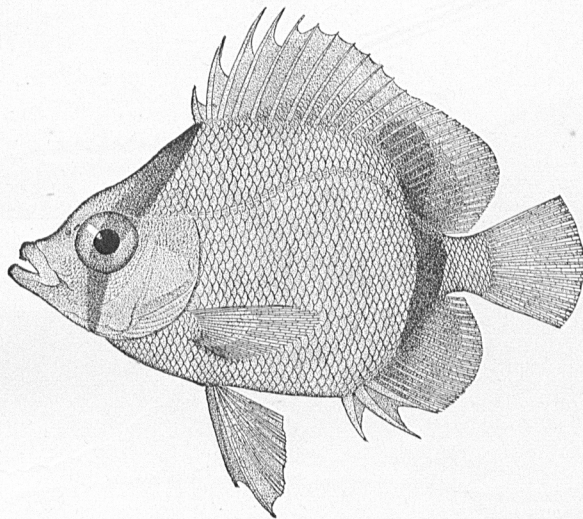


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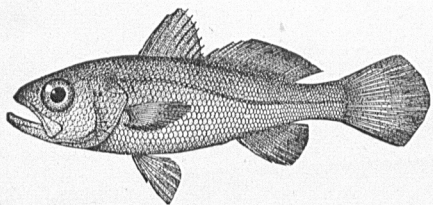


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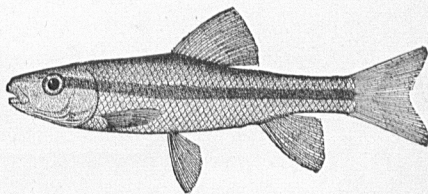


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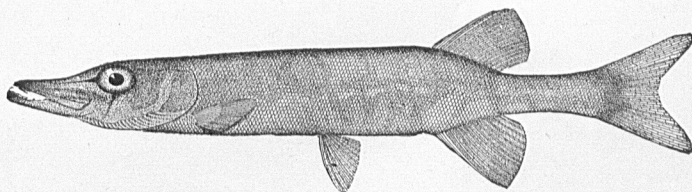


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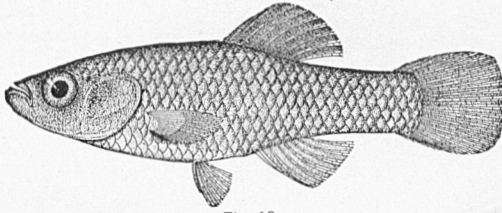


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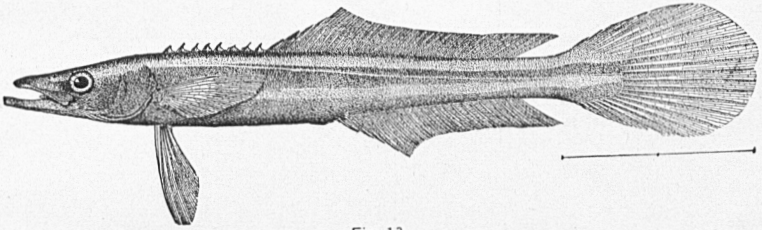


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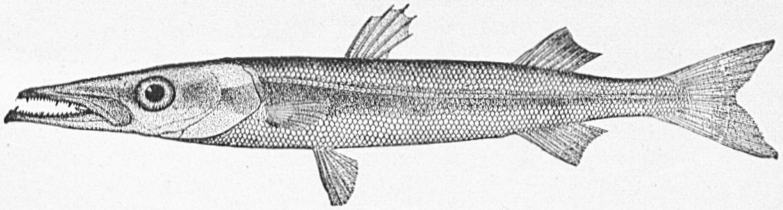


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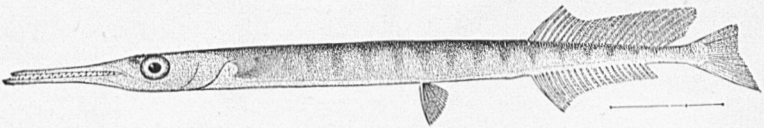


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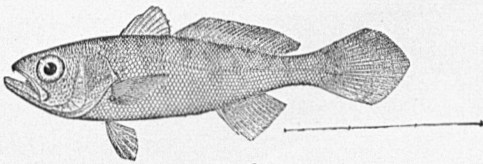


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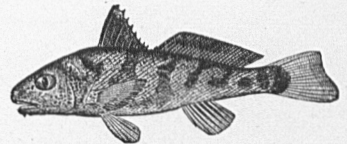


Fig. 7.



Fig. 16.

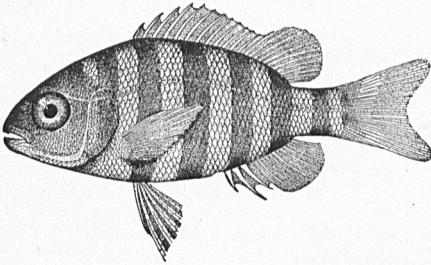


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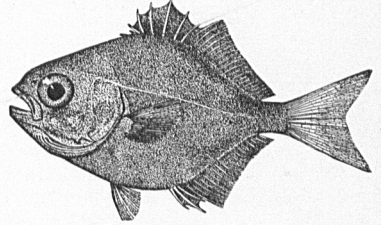


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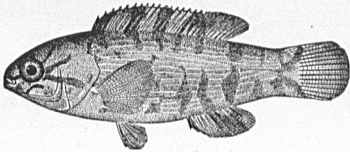


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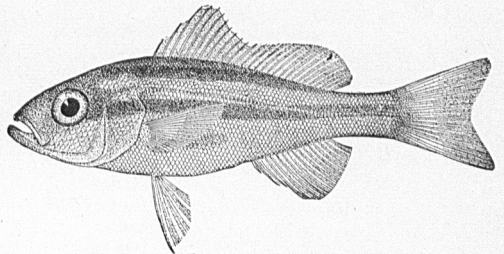


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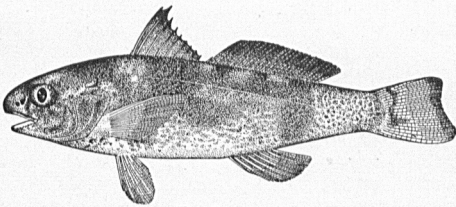


Fig. 8.

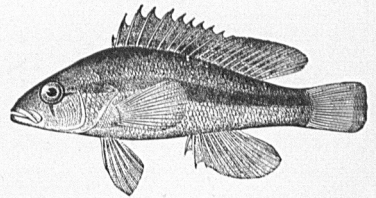


Fig. 12.

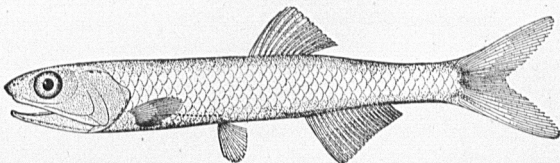


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