Pentamerus and Scutella limestones of the Helderberg sections. The present name is derived from Becraft mountain, Columbia county, N. Y.

23. Kingston beds (new). The 'upper shaly beds' of W. M. Davis, which are typically exposed and attain a thickness of 250 feet in the vicinity of Kingston, N. Y.

24. Esopus grit. Proposed by Darton, with the approval of Professor Hall, for the old term Caudagalli grit. It has been suggested by Frech that the Esopus grit should be regarded as a part of the arenaceous sediments of the Oriskany. The very few fossils which it contains, however, do not as yet fully endorse this suggestion.

25. Catskill sandstone. This is an approximate expression of the value of this formation. Catskill sedimentation doubtless began as early as Portage time, its representation during which is expressed in the term, Oneonta beds.

John M. Clarke,
Charles Schuchert.

FISH FAUNA OF THE WOODS HOLE REGION.

In the issue of Science for October 21st, 1898, the writer noticed the capture in the vicinity of Woods Hole, Mass., within a few years, of 12 species of fishes new to the fauna of southern New England, including 5 not previously known from United States waters. These additions raised the number of species recorded from the Woods Hole region to 222, including 11 strictly fresh-water forms.

The summer and fall of 1899 yielded an extraordinary number of unlooked-for species. Although the season was in some respects unfavorable, owing partly to the almost total absence from the inshore waters of the floating sargasso-weed under which the tropical forms drift in from the Gulf Stream, and although a number of the regular visitants were tardy in arriving and appeared in only limited numbers, the season as a whole was unprecedented for the number of new and rare fishes taken. Most of the species to be mentioned were observed only in Katama Bay, a small body of shallow water separating the eastern end of Martha's Vineyard from Chappaquiddick Island. On August 30th, when this bay was first visited by a party from the Fish Commission laboratory, 4 species not previously known from the region were noted, in addition to a number of rare southern forms. Between that date and October 17th, the bay was industriously seined, at short intervals of time, along about one mile of the eastern shore, and the subtropical fishes were invariably found. On September 1st no less than 9 other species new to the locality were detected, and 4 others were obtained on September 16th, 19th, and 29th. By November 18th, when the last visit was made, the water temperature had fallen to 47° and no rare kinds were caught.

At times the number of species represented in a single seine-haul in Katama Bay was unprecedented for the Woods Hole section, and surpassed by but few Florida or West Indian records. Thus, on September 1st, the record for the day was 56 species, of which 47 were taken at one set, including 7 species not reported from points north of Florida until this year.

The species hereafter mentioned bring the list of Woods Hole fishes to 240. This is a larger number than has been recorded from any other locality in the United States with the exception of Key West, in which region upwards of 250 species have been noted.

RARE SPECIES OBSERVED IN 1899.

Exocœtus heterurus Rafinesque. Flying-fish. Very rare; in 1886 and possibly on one previous occasion this fish has been detected at Woods Hole. A specimen 12 inches long was seined at Menemsha Bight, Martha's Vineyard, on August 1st, 1899; at the same place another, somewhat smaller, was caught in a fish trap on August 21st.

Rachycentron canadum (Linnæus). Cobia; Crab-eater. Rarely observed in recent years and none for a number of seasons; commoner 25 years ago than at any time since; only small (5 or 6 pound) specimens

heretofore observed. On July 18th, 1899, a fine example 4¾ feet long and weighing 60 pounds was caught in the Fish Commission trap in Buzzard Bay, and retained alive until August 31st.

Tetragonurus cuvieri Risso. 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 10th, 1890, the species was added to the western Atlantic fauna by the capture of a specimen at Woods Hole. The taking of another specimen at the same place, on August 1st, 1899, now recorded for the first time, is most interesting and unexpected; the fish, about 1½ inches, was found under a mass of floating rock-weed in Vineyard Sound.

Epinephelus niveatus (Cuvier & Valenciennes). SNOWY GROUPER. Straggling specimens of this tropical species have occasionally been taken in Rhode Island and Massachusetts waters, the first Woods Hole examples being obtained in 1895. In Katama Bay, the fish was common from the latter part of August to the first part of October, 1899, and was observed on every day the bay was visited; upwards of 75 were secured during the season.

Pseudopriacanthus altus (Gill). BIG-EYE. A rare straggler from the West Indies; described by Dr. Gill from Narragansett Bay; recorded from Woods Hole and several other points on Massachusetts coast. In summer and fall of 1899, the fish was common in Katama Bay, almost every seine-haul yielding specimens; over 100 were taken before the advent of cold weather.

Lutianus analis (Cuvier & Valenciennes). MUTTON-FISH. Normal range from Florida to Brazil; north of Florida known only from Woods Hole, in 1876 (7 specimens) and 1897 (2 specimens). In Katana Bay during September, 1899, the fish was found on six different days, and upwards of 20 small specimens were taken.

Chætodon ocellatus Bloch. BUTTERFLY-FISH. A few specimens of this tropical species have been obtained at Woods Hole nearly every year in October and November, 5 being the largest number in one season. In 1899, the fish was positively common at times, and more were collected in Katama Bay than have probably ever been observed in any other locality. Throughout September and until the third week in October, the gaudy little fish were constantly found in the shore waters; 80 were obtained on September 1st, and 50 more on each of three other days, the aggregate number observed during a period of seven weeks being over 400. Some of these were so small as to suggest that they must have hatched after reaching Massachusetts waters.

Chætodon bricei Smith. BUTTERFLY-FISH. Prior to 1899, only 6 specimens of this species, all taken at Woods Hole in 1897, were known. In September, 1899, at Katama Bay, it was found on seven different days, in company with *Chætodon ocellatus*, and over 40 specimens were obtained. During the recent Porto Rican expedition of the Fish Commission, a specimen was secured at Fajardo.

Alutera monoceros (Osbeck). FILE-FISH. The detection of this very interesting East Indian species on our coast at Woods Hole in August, 1898, was referred to in SCIENCE for October 21st, 1898, and is the subject of 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 1st, 1899, is now recorded.

* Notice of a file-fish new to the fauna of the United States. Bulletin United States Fish Commission 1898. Pp. 6 and colored plate.

Spheroides spengleri (Bloch). Swell-fish; Swell-toad. The normal habitat of this species is Florida and Texas to Brazil; the only northern locality from which it is recorded is Woods Hole, where it was observed only in September and October, 1877. During September, 1899, the fish was common in Katama Bay, more individuals being observed on some days than of the common swell-fish (*Spheroides maculatus*).

RECENT ADDITIONS TO THE FAUNA.

Muræna retifera Goode & Bean. Moray. Described from the coast of South Carolina in deep water, and heretofore known only from that locality. A very large specimen was taken in a lobster pot near Tuckernuck Island on July 25th, 1899; it was 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. adscensionis*, and apparently representing one of Poey's imperfectly described Cuban species, was taken in Katama Bay on September 1st. 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* (Linnæus), was once reported from Newport, R. I., by Cope. On September 1st, 1899, 6 specimens were taken at one seine-haul in Katama Bay, and on September 16th, 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 DeKay, 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 1st, and 2 on September 16th; these were all young, from 3 to 4 inches in length.

Epinephelus adscensionis (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 19th, 1899.

Garrupa nigrita (Holbrook). Black Jewfish. 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 jewfish, the young of which is undescribed. The species ranges from South Carolina to Brazil.

Mycteroperca bonaci (Poey). Marbled Rockfish; 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 19th, 1899.

Mycteroperca, sp. Ten specimens of a small grouper were obtained in Katama Bay in September and October. They are apparently referable to *M. interstitialis* (Poey), known only from Cuba, but may be the young of some other species. Only one member of this genus has heretofore been detected on our coast north of Florida.

Eupomacentrus leucostictus (Müller & Troschel). Cocky-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 30th and October 4th, 1899, nine small specimens of uniform size were taken on five different days in Katama Bay.

Teuthis hepatus Linnæus. SURGEON-FISH; TANG; LANCET-FISH.

Teuthis cæruleus (Bloch & Schneider). BLUE SURGEON; BLUE TANG.

Teuthis bahianus (Castlenau). BARBEIRO.

These three species are recorded from Florida, the West Indies, and Brazil; the first-named 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 specimens were obtained on seven different occasions. The last examples were secured on October 4th, when the three species were represented in one seine-haul. About half the specimens are referable to the common species (*T. hepatus*). All the examples are small, although those last taken exhibit a slight increase in size compared with those caught early in September.

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 4 or 5 occasions in Katama Bay. All of the specimens were small. On November 6th, 1899, a fish 15½ inches long was washed ashore at Cuttyhunk.

Chilomycterus antillarum Jordan & Rutter. BUR-FISH. Described from Jamaica in 1897; in 1868 cited from Cuba by Poey as '*C. fuliginosus* or a doubtful species;' and not heretofore known from any other localities. On September 7th, 1897, a small specimen was taken in Quisset Harbor, near Woods Hole.

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 29th.

HUGH M. SMITH.
U. S. COMMISSION OF FISH AND FISHERIES.

ZOOLOGY AT THE COLUMBUS MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

COLUMBUS MEETING, A. A. A. S.

THE work of this Section showed a flattering increase of interest over recent years and a list of papers of more than usual value. The discussions were often animated and general, and the effect of the meeting as a whole was to give a very encouraging future for the Section. The address of the Vice-President, Professor S. H. Gage, of Ithaca, N. Y., was a very practical paper and the views expressed received very general concurrence. It has already been published in the columns of