

3.—REPORT ON THE COAST FISHERIES OF TEXAS.

By CHARLES H. STEVENSON.

INTRODUCTORY.

The published information regarding the fisheries of Texas is very meager, and consists almost entirely of the accounts contained in two reports* of the U. S. Fish Commission, one relating to the year 1880, the other being a condensed statement based on an inquiry made in January and February, 1891. Outside of the localities in which the fisheries are prosecuted little knowledge exists as to their extent, methods, and importance; and in considering the natural resources of the State, the vastness of its other branches is apt to completely overshadow the fisheries. In the investigation of 1891 the coastal regions of Texas were canvassed by the writer, in the capacity of a field agent of the Division of Fisheries, and the present report represents the results of personal observations made at that time. All the important fishing centers were visited, and the principal fishermen, fish-dealers, etc., were interviewed. Owing to the increasing prominence of the oyster industry, special attention was given to a study of its methods and conditions in the different localities.

Some difficulty was experienced in obtaining correct data regarding the quantity of the various species of fish taken. As a rule no books are kept by the fishermen or marketmen in such manner as to be of value in determining the quantity of products handled; and the statements made regarding these data differed greatly, even as to the fisheries of particular localities. Consequently, for information as to the quantity of products, it was necessary to depend largely on the records in the offices of the various transportation companies. This was quite satisfactory as regards the total quantity of fish obtained, but of little value in determining the quantities of the various species taken from the water. Hence the figures given in this report for the different species of fish taken must be accepted as only approximately correct.

*The Fisheries and Fishery Industries of the United States, 4to, 7 volumes, Washington, 1884-87.

A Statistical Report on the Fisheries of the Gulf States. Bulletin U. S. Fish Commission, 1891. Washington, 1892.

IMPORTANCE OF THE FISHERIES.

The investigations by the U. S. Fish Commission in 1880 showed that the number of men employed in the fisheries of Texas was 601; the capital invested, \$42,400; and the weight of the fish taken, 3,858,875 pounds, valued at \$128,300. In 1890 the number of men engaged in the fishery industries of the State was 1,277; the value of property employed, \$315,427, and the weight of the products was 7,961,400 pounds, for which the fishermen received \$313,912.

On account of the incomplete transportation facilities, the difficulty of preserving fish in a warm climate for a considerable length of time, and the generally undeveloped condition of affairs on the coast, the fisheries of this State have not heretofore attracted great attention. They have been controlled and prosecuted mainly by Mexicans and natives of Southern Europe, who were usually unfamiliar with the methods in use at other fishing localities in this country. But with the improvement and extension of the railroad system of the Southwest, the cheapening of ice by manufacture, and the extensive immigration which this section of the country is now attracting, the fisheries give promise of being at some time classed among the important industries of the State. The entire State, together with New Mexico, Colorado, Kansas, and a large part of Mexico will be thus benefited by receiving a ready and fresh supply of salt-water fish.

At present "bay seining" is the most important fishery in Texas. The oyster industry is second in extent, but will doubtless rank first within a few years. These two fisheries are prosecuted extensively all along the coast. Each locality also has its own minor fisheries, such as the turtle, the shrimp, the crab, the flounder, the surf-seine, the cast-net, and the hook-and-line.

Aside from the surf seines in use on Galveston Island, some hook-and-line fishing at different places, and an occasional trip of a harbor boat from Galveston to the red-snapper banks, all the fisheries of Texas are confined to the bays and their estuaries along the coast. Of the 7,961,400 pounds of marine products obtained by the fishermen of Texas in 1890, the quantity taken from the Gulf proper is estimated at less than 300,000 pounds.

Since 1880 all the Texas fisheries have increased in extent excepting for shrimps, which are reported as less abundant than they were ten years ago. The catch in 1880 was 637,500 pounds, while in 1890 the quantity taken in both the seines and cast nets amounted to only 179,800 pounds. The oyster and bay-seine fisheries exhibit the greatest actual increase in the value of products.

The growth of the fisheries is due principally to the development of the methods of marketing the catch. The shipping facilities along the coast, except at one or two places, have been greatly increased during

the last decade. The building of the Mexican National Railway (narrow gauge) from Corpus Christi to Laredo, in 1880, opened up a Mexican market for the fish and oysters taken in the vicinity of the former place. Then came the construction of the San Antonio and Aransas Pass Railway from San Antonio to Corpus Christi, and its extension a few years later to Aransas Bay, which facilitated the shipping of fish from those two places to the North and West. But the abandonment of those two ports by the Morgan Steamship Line counteracted somewhat the advantages gained by the railroad connections. The shipping facilities of Matagorda Bay have greatly declined since 1880. When this port was abandoned by the Morgan line of steamers the trade with Galveston almost entirely ceased.

The manufacture of ice has also greatly benefited the fisheries. On the shores of Sabine Lake, Galveston Bay, Aransas Bay, and Corpus Christi Bay there are establishments for ice manufacture, and the product can now be obtained in car-load lots at from \$3 to \$8 per ton, at any railroad station on the coast.

THE FISHERMEN.

The number of men engaged constantly in the fisheries of this State in 1890 was 819, the number who fished for a portion of the time only was 286, and 172 men were employed in the marketing houses and canneries, making a total of 1,277. In 1880 the number of professional fishermen was reported to be 291; the semi-professional, 200; the men on shore, 110; a total of 601.

Only a small portion of the Texas fishermen were born in America; they are chiefly natives of Italy, Sicily, Greece, Austria, and Mexico. Of the native fishermen a large portion were of foreign parentage. A much greater proportion of native Americans is engaged in taking oysters than in the seine fishery. The negroes along the coast do not engage in fishing, except in a small way from the wharves with cast nets, lines, etc.

The fishermen as a rule are not familiar with other occupations. Many of them have inherited their vocations by direct descent for many generations. Prior to their coming to Texas some have fished for the markets of Palermo, Naples, or Athens, or have supplied fish at such Mexican towns as Vera Cruz, Tampico, or Soto la Marina. As a class they are independent in their manners and habits, but are nearly always poor and unthrifty. Their life while on a fishing trip is very rough. The hard, rounding floor of the cabin, with a blanket over it, serves as a bed. The provisions, while usually plentiful, are of the plainest, consisting chiefly of salt meat, bread, hard-tack, onions and garlic, potatoes, and coffee. The cabin floor serves as a table. The cooking is generally done on a small stove or by an open fire in a pot, and one of the crew attends to that work without extra pay.

FISHING VESSELS AND BOATS.

The number of sail craft employed regularly in the fisheries of Texas in 1890 was 311, valued at \$106,800. Of this number only 18 measured over 5 tons, the combined tonnage of these being 152.59. The fishermen prefer boats of less than 5 tons measurement in order to escape the inconveniences of having them licensed at the custom-house. Besides the sail craft, 536 skiffs, valued at \$5,615, were employed in 1890. Along the Texas coast the expression "boat" is applied to all sail craft, while the word "skiff" is used to designate something propelled by oars; and it is with these meanings that the two words are used in this report. The sloop, cat, and schooner rigged centerboard boats are the prevailing types employed in the oyster, seine, and turtle fisheries. Square or "lugger" rigged boats are not in use at present in the fisheries of this State. The lugger is particularly adapted to winding bayous, where sailing close to the wind is necessary, as in Louisiana; and as few such places occur in the fishing regions of Texas, the safer and more speedy sloop and cat rigged boats are obviously preferable.

The construction and the rig of the sailboats do not materially differ from the styles in general use along the coast of the Middle and New England States. In order to easily pass through the shoal waters of the bays, these boats are built very shallow, having either a flat or "round-knuckle" (one-half flat) bottom. They are usually from 22 to 34 feet long, from 8 to 12 feet wide, and from 1½ to 3 feet deep. The *Cosatinporta*, which was built at Corpus Christi in 1889, may be taken as a type of the best class of sail craft in use. Her dimensions are, length, 30.7; breadth, 10.9; depth, 2.7; net tonnage, 5.37.

The sailboats are built without elaborate or unnecessary finish or equipment. They are decked over fore and aft, and frequently the entire length. All of them have a small cabin, which serves as a cooking and sleeping room. The cost ranges from \$150 to \$1,800, averaging about \$400. They are built mostly in Texas, at Galveston, on the Lavaca River, at St. Marys City, and Corpus Christi. There are, however, no extensive boat-building establishments in the State.

Occasionally, under the influence of a southeast wind, some of the bays become exceedingly rough. Especially is this true of Matagorda Bay, which in threatening weather the fishermen avoid almost as much as they would the open Gulf. More wrecks have probably occurred in this bay during the past six years than in all the remaining bays of the State combined. As the boats are never insured, their loss is a serious matter to the fishermen.

Each sailboat usually carries one or two skiffs or tenders, costing from \$5 to \$15. These skiffs are roughly constructed, many not being painted. All of them have flat bottoms, so that they may be easily run ashore.

THE FISHERIES.

THE BAY-SEINE FISHERY.

This is at present the most important of the fisheries of Texas. It is prosecuted in the same manner and with the same form of apparatus in all the fishing sections along the coast. In 1890 this fishery gave steady employment to 358 men, using 110 sailboats valued at \$38,750; 114 seines valued at \$15,200, and other apparatus to the value of \$4,643. The total catch amounted to 3,609,100 pounds, for which the fishermen received \$150,592. In 1880, according to figures reported by the U. S. Fish Commission, 126 men engaged in fishing 42 seines and the catch amounted to 650,000 pounds, valued at \$32,500.

These seines are hauled in all the bays along the Texas coast; they are not used in the Gulf of Mexico nor in the rivers. Ten years ago the greater part of those operated were owned at Galveston; since then the number used in Aransas Bay has shown the greatest increase, as the fish have grown scarcer in Galveston Bay and the railroad facilities at Aransas Bay have improved.

Each party of seine fishermen, which usually consists of from two to four men, ordinarily has one sailboat, one seine, one or two skiffs, and two or more live-fish cars. The sailboats and skiffs are of the ordinary type used in all the fisheries on this coast. The sailboats never have "wells" in which the fish may be kept alive, and ice is not used for preserving the catch; but floating cars are used, in which the fish are kept alive while being transported to market; these are roughly constructed, usually of slats in the form of and about the same size as a skiff; in fact, some of the fishermen use an old skiff, cutting or boring holes in it and covering it with an open slat-work top. The live-fish cars are not usually painted; they have capacity for 400 to 2,000 pounds of fish, according to their size and the temperature of the water. The cost ranges from \$5 to \$15 each. They are carried on board the sailboats when empty of fish, and when the fish are put in them they are towed behind.

The seines vary in length from 80 to 200 fathoms and in depth from $4\frac{1}{2}$ to 6 feet. The small depth is made necessary by the shallowness of the water. Usually no lead or similar weight is attached to the bottom, the sinker consisting of a tarred rope about an inch in diameter; but some of the seines have several lead sinkers on the tarred rope, near the middle. In the center of each seine is a cone-shaped bag from 10 to 15 feet in length and 3 or more feet wide where it joins the bunt, tapering to 6 inches at the smaller end.

The ordinary mesh of the seine is $1\frac{1}{2}$ inches square, but the net used in the bag and for a distance of 12 feet on each side has a mesh about $\frac{3}{4}$ inch square. This smaller mesh is necessary in order to increase the strength of the seine in those places, to prevent tearing by alligator gars, tarpon, etc. The cost of an ordinary seine is about \$1.10 per

fathom. One usually lasts about two years, but requires constant mending and repairing.

The fishermen generally work on shares and sell their catch to the marketmen at a price which is usually fixed for the season. In dividing the profits as well as in meeting the expenses all the crew share alike. The captain receives no more than any one of his men, and his duties are equally laborious. The boat and seine, which are generally owned by the captain or some relative or friend of his, count as one share. The seine is kept in good order by the crew, and the owner pays for such expenses as repairing the boat, painting; etc. Formerly at some of the ports, and particularly at Galveston, in order to more easily control the trade of the fishermen, the marketmen owned some of the boats and apparatus and rented them to the fishermen, the marketmen receiving their proportionate share of the catch; but the practice has been discontinued to a considerable extent, as the fishermen fail to take the best care of the boats and seines when they have no property interest in them.

The average annual income of the bay-seine fishermen of Texas, derived from their seining operations, is about \$325. This is increased somewhat by hunting and marketing ducks, geese, and other food or plumage-bearing birds with which the bays along the Texas coast abound during certain seasons of the year. The profits are quite regular, not varying much from year to year, although steadily increasing with the development of the fisheries and the constant advance in the market price of the catch.

Occasionally two crews "double up," that is, combine, uniting their seines, and two of the men run the catch to market while the others continue fishing. The proceeds from the catch are then divided equally among the men and boats. At times, when fishing in comparatively deep water, four and even five crews combine for several hauls, fastening the seines end to end.

The men always get in the water to haul the seine without regard to the temperature. They may begin to haul it from the boat when in 8 feet of water, but the fish are landed where the water is from 10 to 36 inches deep. On account of the men having thus to stand in the water, the impracticability of their fishing where the bottom is very muddy will be readily observed, although fish may be found there in abundance, as in Mesquit Bay.

After a haul of the seine the fish are transferred to the live-fish car; the crabs and "poor fish" are thrown away; one of the crew is left to tow the "car," and the others seek another hauling berth in the immediate neighborhood. Or, if the next hauling site be distant 2 or 3 miles, and the wind is favorable, all of the crew return to the boat and sail to the next locality.

The bay-seine fishery is prosecuted during all seasons of the year, but less zealously in the summer on account of the smaller demand for fish. The principal species of fish taken by means of these seines are

redfish, sea trout, sand trout, sheepshead, croakers, jackfish, hogfish, drum, mullet, bluefish, Spanish mackerel, pompano, rockfish, jewfish, pigfish, and whiting.

The following species are also reported as being taken in small quantities: Shoemaker, perch, pike, flat croaker, robalo, sawfish, catfish, calico-fish, needle-fish, moonfish, gulf menhaden, crabs, etc. Most of these species are considered of no value and are thrown away as soon as removed from the seines, except occasionally when better fish are scarce.

By far the greater part of the fish brought to market by the bay-seine fishermen consists of redfish, sea trout or squeteague, and sheepshead. Of these, the trout is generally considered the finest for the table, but it does not bear transportation so well as some of the other species. The redfish is preferred for shipping purposes, and is much more popular for the table than the sheepshead, which at times does not meet with a ready sale.

The average weight of a redfish is about 10 pounds and the length 2 feet or over, while some weigh 40 pounds and are 4 feet long or over. The Mexican fishermen in Texas frequently call it the "pez colorado," and in Louisiana the name "poisson rouge" is applied to it. According to the fishermen, the redfish are not usually found in spawn when weighing less than 10 pounds. All fish of this species which weigh over 16 pounds are called "bulls." These are sold at a reduced price, and at so much per fish, usually about 25 cents.

The sea trout (the weakfish or squeteague of the Atlantic coast) average in weight about 3 pounds, and at times attain a weight of 10 pounds and a length of 3 feet. They spawn when weighing about 1½ pounds. They are fine food-fish, but do not keep well, the flesh being very soft. While trout are taken at all times of the year, they are more plentiful in March, April, and May. The sheepshead average in weight about 2½ pounds, with a maximum weight of about 10 pounds. All along the Gulf coast the name of this fish is contracted into "sheep-head."

Occasionally the fish taken by a crew during several days consist almost entirely of one of these three most plentiful species. On several occasions the writer has at different ports in Texas seen several thousand pounds of fish of which probably 90 per cent were of one species. One week they may be nearly all sheepshead and the next week trout or redfish. Ordinarily the fishermen and marketmen put the same value on the different species of fish taken, but if an extra large quantity of "poor fish" is taken, or if the catch consists largely of sheepshead, the marketmen may refuse to accept a portion or all of it.

Little difference has been noticed in the quantity of each species of fish taken by the bay seines from year to year. Redfish are reported as having decreased most in plentifulness; bluefish, pompano, and Spanish mackerel are growing more abundant. There is no place along the Texas coast at which the supply of fish is less than the

demand, except at Galveston Bay. Occasionally the Galveston fleet is for weeks unable to supply the market demands; but in Matagorda, Aransas, and Corpus Christi bays, and at Point Isabel many of the crews are frequently idle for several days on account of an oversupplied market.

Green turtle (*Chelonia mydas*) and terrapin (*Malaclemmys palustris*) are occasionally taken in the bay seines while being hauled for fish. A small chain is also sometimes attached to the lead line of the seine and a haul is made especially for them. This is done chiefly at Aransas Bay. The terrapin taken weigh about 3 pounds each and are sold by the fishermen at from \$4 to \$15 per dozen. They do not possess the fine flavor of the Maryland diamond-back. The turtle average from 5 to 20 pounds and sell for about 3 cents per pound. They are the young of the green turtle common on this coast.

Believing that the fish are caught in greater quantities than their natural fecundity can make good, there is a desire on the part of many persons, especially those interested in developing the sporting fisheries of Texas, to restrict in some way the use of seines. While the supply of fish may be decreasing, yet there does not appear to be an urgent necessity for very great restriction. The cessation of the seine fishery in the bays for four months from May to August, which is the plan generally urged, would throw entirely out of employment over 350 men, removing from the coast towns a monthly revenue of more than \$12,000, and taking from the market a cheap and wholesome article of food. It would also seriously affect the marketing of fish taken during the winter, since purchasers in the interior would prefer obtaining their supplies from such sources as could provide for them continuously throughout the year. If restriction be deemed expedient and necessary, the prevention of the marketing of large fish, say of redfish weighing over 14 pounds (advocates of a close time contend that redfish, more than any other species, require special protection), would largely answer the purpose without embarrassing persons depending on the bay-seine fishery for a living. These large redfish are the spawning fish. They are difficult to market, being coarse and of poor flavor, and are sometimes even thrown away.

For the purpose of comparison, the total catch by bay seines at the various fishing localities in the State during each of the past four years is herewith appended:

| Localities. | 1887. | | 1888. | | 1889. | | 1890. | |
|-------------------------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|
| | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. |
| Sabine Lake..... | 42, 160 | \$2, 380 | 45, 600 | \$2, 030 | 45, 750 | \$2, 795 | 47, 000 | \$2, 893 |
| Galveston Bay..... | 1, 455, 500 | 69, 140 | 1, 469, 000 | 70, 320 | 1, 489, 400 | 74, 668 | 1, 418, 500 | 72, 009 |
| Matagorda Bay..... | 74, 800 | 2, 800 | 81, 000 | 2, 950 | 88, 800 | 3, 110 | 102, 750 | 3, 593 |
| Aransas Bay..... | 1, 089, 000 | 32, 890 | 781, 000 | 23, 650 | 1, 076, 000 | 38, 050 | 1, 244, 100 | 43, 502 |
| Corpus Christi Bay..... | 540, 000 | 18, 900 | 605, 000 | 21, 175 | 685, 000 | 23, 801 | 719, 950 | 24, 905 |
| Laguna Madre..... | 91, 800 | 3, 400 | 86, 000 | 3, 200 | 81, 050 | 2, 750 | 76, 800 | 2, 580 |
| | 3, 293, 260 | 129, 570 | 3, 007, 600 | 123, 925 | 3, 466, 000 | 145, 183 | 3, 609, 100 | 150, 592 |

THE CAST-NET FISHERY.

While this is one of the minor fisheries and no one depends on it for a living, yet numbers of cast nets are used at the various settlements along the coast. In 1890 the number used in the State was 315; the quantity of fish taken was 91,500 pounds, the value of which was \$3,540.

The cast nets are circular, varying in diameter from 4 to 10 feet. Each net has a small ring in the center, through which pass several small ropes which are attached to the outside rim of the net. After passing through this ring, which is usually made of horn, the ropes are all united and fastened to one larger rope, which is used as a hand-line. Around the edge of the net a number of lead sinkers are arranged at equal distances from each other. The cost of these nets ranges from \$1.50 to \$8. The average size of the mesh is about 1 inch. Cotton twine is the material usually preferred in their construction.

With the hand line on the ground under one foot, or otherwise secured, the net is held at different places on the rim by the mouth and the two hands; then, with a circular motion, it is thrown so as to fall flat upon the surface of the water. Sinking to the bottom it covers such fish as are unable to make their escape from beneath it. Then, by hauling in the main rope or hand line, the net is pursed and the fish are inclosed.

This method of fishing can be practiced only in shallow water. The catch consists mostly of mullet and shrimp. This method of taking mullet is much more successful than by the use of the seines, since so many of these fish escape over the top of the seine while it is being hauled. No boats are used in this fishery, it being carried on from the wharves and docks. The persons using the cast nets are boys and men having no other employment. The catch, which is small, does not pass through the wholesale fish markets, but is usually peddled about the settlements by the fishermen.

POUND NETS, GILL NETS, ETC.

At present there are no pound nets used in Texas. This is due to the fact that they would be destroyed by sharks, alligator gars, and other large predaceous fishes with which these waters abound. About fifteen years ago a pound net of the type used along the coast of the Middle States was set in Galveston Bay, and while it was in working order quantities of fish were taken in it; but large predaceous fish tore the netting so frequently that it required constant mending in order to retain any of the food-fishes. On this account the use of the pound net was soon abandoned. It is possible that pound nets made of galvanized wire or stake and brush weirs could be successfully employed if the sentiment of the people would permit their use.

Except such as are used in the green-turtle fishery, I am not aware that stationary gill nets have ever been used in taking marine products

in the coastal waters of Texas. They would be of little service in these waters, not only on account of the damage that would be done to them by predaceous fish, but also because the high temperature of the water would necessitate at too frequent intervals their being raised to remove the fish while in good condition.

THE SHRIMP-SEINE, SURF-SEINE, AND GREEN-TURTLE FISHERIES.

Around Galveston Island, besides the bay-seine fishery, two special forms of seine fishery are found in practice, one for taking shrimp in Galveston Bay, the other used in the surf on the south side of Galveston Island for obtaining sand trout, large redfish, etc. As they were found at no other locality, the discussion of these fisheries will be included in the description of the fisheries of Galveston Bay.

Large green turtle (*Chelonia mydas*) occur more or less abundantly all along the Texas coast; a few are taken by the fishermen of Point Isabel, but as their capture and utilization centers at Aransas Bay a description of this fishery will be found in the notes on that locality.

HOOK-AND-LINE FISHERIES.

While seine fishing continues so successful as at present, it is not probable that an extensive hook-and-line fishery will be developed in the Texas waters; yet, from all the bays along the coast and in the many rivers throughout the State, quantities of fish are taken in this way by sportsmen as well as by those men who engage in the other fisheries.

Catfish are taken on trot lines and by means of hand lines in Sabine Lake, Guadalupe River, Rio Grande, and to a less extent in many other streams. These are the large mud or channel catfish common in the Mississippi River and the Southern States. They sometimes attain a weight of 50 and even 70 pounds. They are quite well liked in this State, in some of the interior towns being preferred to redfish or trout.

Some line fishing in the surf is engaged in on the south side of Galveston Island, and at one or two other places. From all the coast settlements some hand lines are used for taking redfish, trout, sheepshead, tarpon, and other kinds common on the coast. More redfish are taken in this manner than any other single species, mullet and shrimp being the most popular baits used for them. They are very gamy, and a 25-pound redfish will give plenty of sport.

The tarpon, known in Texas also as "grande écaille" or "savanilla," are abundant, but not frequently landed. Jewfish attract much attention in the spring. The Mexican fishermen call this fish the "guasa," and at Pensacola it is known by the name of "warsaw," doubtless a corruption of "guasa." In Texas it is also called the "junefish," because of its being more plentiful in June than at other times. Crabs and mullet are used as bait. Occasionally fish of this species weighing over 500 pounds are taken. In Aransas Bay, in 1890, a jewfish was caught which weighed 597 pounds round weight.

RED-SNAPPER FISHERY.

"Outside fishing" from vessels is also engaged in occasionally, the species sought being the red snapper. All along the coast of Texas from Sabine Pass to the mouth of the Rio Grande there is an irregular series of banks, or reefs, on which these fish may be taken. On account of there being no extensive fishing for them in this part of the Gulf of Mexico, the location of these banks is not generally known, and doubtless but a small number of them have ever been fished on.

Following is given the location of the best-known reefs from which red snappers have been obtained: Due south from Sabine Pass and about 13 miles distant there is a small reef on which a few vessels from Galveston fished several years ago; the depth of water on this reef varies from 7 to 12 fathoms. Off Galveston Island there are two banks, one southeast and distant about 45 miles, in 12 fathoms of water; the other about 85 miles south of the island, with a depth of 30 to 45 fathoms of water. Southeast of Cedar Bayou, in 15 fathoms of water, there is a small bank from which a few fish are taken at times by men living at Aransas Pass and Corpus Christi. A small reef a few miles south of the entrance to Aransas Bay also attracts some attention. Another bank is reported about 6 miles east of Brazos Santiago and Boca Chica.

It is highly probable that all along the coast of Texas and Mexico there are innumerable small patches of sea bottom where red snappers and groupers are to be obtained. Off Sabine Pass and Galveston Island these reefs will probably be found ranging from 5 to 100 miles distant from the shore. Going southwest along the coast, the width of this area becomes gradually smaller, the limits of the reefs being nearer the shore. Off Padre Island there are doubtless no snapper banks at a greater distance from the shore than 55 miles.

Going southward the width of sea bottom on which the red snapper will probably be found continues to contract. The Mexican fishermen report that off Sota la Marina they have never found them at a greater distance from the shore than 15 miles, and similar reports are received from Tampico and Vera Cruz. This width remains about the same all along the coast of the State of Vera Cruz and until in the vicinity of the mouth of the Tobasco River. Here the area begins to enlarge, and rounding Yucatan until Cape Catoche is reached, the grounds on which the red snapper will probably be found extend from 5 to 120 miles from the coast. On account of the great depth of water, there can scarcely be extensive reefs on the Yucatan coast beyond Cape Catoche.

The grounds north and west of Yucatan constitute the well-known Campeche Banks, which have a reputation for being abundantly supplied with fish, and particularly with the red snapper. Aside from one or two trips no attempts have been made to establish a fishery here, on account of the distance from American ports.

In December of 1890, the schooner *Gertrude Summers* (61.19 net tonnage), of Noank, Conn., Benjamin Latham captain, made a trip to these banks, and in two days' fishing, with seven men, took 22,000 pounds of red snapper. On the first day the catch amounted to 14,000 pounds. These fish were rather large, the average weight being about 10 pounds each. In expectation of obtaining smaller fish in shoaler waters, the vessel was sailed nearer the shore. During the second day's fishing Capt. Latham was not much more successful in obtaining small fish, but took 8,000 pounds of mixed size. With this fare he sailed to Galveston. On account of their large size and the fact that the market was not accustomed to so large a quantity of these fish, they were not disposed of at a good price.

In January, 1891, this vessel made another trip to the Campeche Banks, securing 15,000 pounds of fish. In the same month one trip was made to the reefs located about 85 miles south of Galveston Island, from which about 5,000 pounds of fish were obtained.

The attempt to market red snappers from Texas ports has not met with the success expected. This is due to several reasons, among which might be mentioned the large size of the fish and the orders not having been secured from the inland markets before their arrival.

Mr. Heck, who at present has a retail fish market in Corpus Christi, states that he has fished from Vera Cruz in a 52-ton smack, with four men, and obtained 16,000 pounds of red snappers in about five hours. There is every reason to suppose that the development of this fishery offers special inducements both to fishermen and capitalists.

From some of the ports along the Texas coast the entire country west of the Mississippi River may be cheaply reached and supplied with this excellent fish. For this purpose Galveston affords superior facilities, its freight and express accommodations being superior to those of any other port on the Gulf of Mexico west of New Orleans.

At Galveston, under the present conditions and prices, the fish may be taken from the vessel, iced, packed, and delivered in carload lots by fast freight to points within 1,000 miles, and even to Chicago, for 1½ cents per pound.* Neither Pensacola nor Mobile could readily compete with Galveston in supplying the western half of the United States.

THE FLOUNDER FISHERY.

The taking of flounders by means of spears is engaged in during the summer months by a few persons living at Galveston, Aransas Bay, and Corpus Christi. This fishery is prosecuted mostly at night. The men wade out in the shallow water carrying lighted torches and using flounder spears or some similar instruments of capture. Many forms of spears are used. Some of the fishermen employ an ordinary table fork fastened to a stick, while others and probably the most successful

* At Galveston the price of ice ranges from \$1 to \$8 per ton. Fast-freight rates from Galveston to Chicago are about \$120 per carload. Besides ice, etc., one car carries about 18,000 pounds of fish.

ones use a table fork without the extra stick, merely grasping it by the handle. The catch, which is usually sold by the street peddlers, was reported to have been 67,000 pounds in 1890. This was proportioned among the various fishing localities, as follows:

| Localities. | Pounds. | Value. |
|-------------------------|---------|---------|
| Galveston Bay..... | 27,000 | \$1,600 |
| Aransas Bay..... | 30,000 | 1,440 |
| Corpus Christi Bay..... | 4,000 | 160 |
| Total..... | 67,000 | 3,200 |

THE CRAB FISHERY.

The taking of crabs on the coast of Texas scarcely amounts to the importance of a commercial fishery, yet about 32,000 dozen are caught and marketed each year by boys and other persons employed around the wharves. These are taken by means of short hand lines and roughly made trap nets. The catch is usually peddled about the cities, being sold at the rate of 15 to 20 cents per dozen. The quantity of crabs taken in Galveston Bay is about five-sixths of the catch of the entire State. The number taken in the waters of Texas depends entirely on the small local demand, and there seems to be no limit to the quantity that might be obtained if they could be marketed. The seine fishermen take large quantities, but do not save them.

The following table shows the number and value of the crabs reported as taken at the various fishing localities in 1890:

| Localities. | Number. | Value. |
|-------------------------|---------|---------|
| Galveston Bay..... | 325,000 | \$1,200 |
| Aransas Bay..... | 26,400 | 440 |
| Corpus Christi Bay..... | 23,600 | 400 |
| Laguna Madre..... | 6,600 | 55 |
| Total..... | 381,600 | 5,095 |

ALLIGATORS AND PORPOISES.

While the capture of alligators is not a matter of commercial importance in this State, yet they are somewhat plentiful in the swamps and river bottoms, and a number are killed every year by sportsmen and others. Several years ago, when their hides were not so cheap as at present, the number taken was much greater than has been the case during the past three or four years. The hunting for them has somewhat reduced their abundance.

Porpoises are numerous on the Texas coast, and large schools of them are often seen in the bays as well as outside along the coasts. They are very frequently observed playing in the cutwater of vessels sailing in the Gulf of Mexico. It is reported, however, that they have never yet been taken for commercial purposes.

THE OYSTER INDUSTRY.

EXTENT AND IMPORTANCE.

For many years oysters have been taken in nearly all the estuaries along the Texas coast. At low tide the wharf posts and pilings, the buoy stakes, and the reefs left bare by the receding water, are seen to be covered with small oysters. At times, particularly in the spring, when heavy freshets occur and fill the bays with fresh water, many of the oysters are destroyed; but this rarely happens to all the reefs in any one bay during the same year, and within two or three years they are usually as plentiful as before the occasion of such a disaster.

Until quite recently the taking of oysters was carried on in a very irregular manner, but with the increase in transportation facilities and the influx of capital along the coast the industry is rapidly developing into respectable proportions.

In 1880 only 95,625 bushels of oysters were taken from all the bays in the State. In 1890 the catch amounted to 440,800 bushels, which were sold by the fishermen for \$127,990; 369 men were steadily engaged in tonging, and over 100 more in transporting and marketing the catch; 189 sailboats valued at \$66,250, 1 steamer valued at \$15,000, and other apparatus to the value of \$5,451, were constantly used in this industry. A number of general freighting boats were also employed in transporting the catch for a short while during the busy season. The number of oystermen reported in 1880 was 200, and the value of all sailboats, skiffs, tongs, etc., was \$17,750.

The oysters found on the Texas coast are the same species as those occurring along the shores of the Middle States, differing only as the oysters of one bay may from those of another in the immediate locality. The oysters of the several bays of Texas differ as much from each other as from those on the Atlantic coast. In general the shells, while not like those of the "coon oysters" of some of the Southern States, are rather long and of very irregular formation. In many places the growth of oysters on a bed is several feet deep, forming ridges rising above the surrounding grounds. In such places, as well as on the muddy bottoms, they have a tendency to grow in clusters, often large enough to fill a bushel basket; this results in great irregularity in the contour of the shell. On account of this and the rank growth of the shell, caused by the abundance of lime brought down by the rivers, the yield of "solid meats" to the bushel is not as great as the average yield of the same grade of oysters on the Atlantic coast. A "barrel" of Texas oysters "opens out" on an average not over 6 quarts, while in the Middle States the same quantity would contain from 8 to 10 quarts of meats. The growth of the oysters is quite rapid, it requiring only about 550 "2½-year olds" to fill a 3-bushel barrel. In the Chesapeake region it requires fully 750 oysters of that age to equal this measurement. Some of the Texas oysters are so large that less than 100 fill a 3-bushel barrel; these are found chiefly in the muddy sections of Matagorda and Mesquit bays.

The quality of Texas oysters compares favorably with that of those found on the Atlantic coast. They are quite similar to the "Western Shores" of the Chesapeake Bay, or those obtained from the "Kettle Bottoms" in the Potomac River. In the spring, on account of the large quantities of fresh water that fill the bays, the oysters are frequently rather fresh, but they are nearly always fat. Except from November to March, the oysters in Texas spawn to a limited extent at all periods in the year, but more particularly during the first half of May.

These oysters are quite free from a number of enemies and adverse agencies common on the middle Atlantic coast. Starfish are not known in Texas, drills are not abundant, and an excellent set of oysters is secured nearly every year. But the Texas oyster industry has its own troubles, the greatest being the destruction caused by heavy freshets in the spring. All the rivers and estuaries of Texas, except the Rio Grande and Brazos, empty their waters into the bays along the coast, and every spring more or less damage is done to the oysters by the fresh water with which some of the bays are filled for several days if the wind be favorable for such a condition. Happily, however, it rarely occurs that the oysters on all the beds in any one bay are destroyed in this manner.

Another trouble which exists here to a considerable extent is the damage done by the drumfish. These are very numerous in all the bays along this coast, and they do much injury, especially where oysters have been taken from the reefs and bedded to await a more favorable market. Occasionally an oysterman builds a picket fence around his bedded oysters to prevent damage from this source, but this practice is not general.

OYSTER BEDS, LOCATION, AREA, ETC.

In all the bays and at the mouths of the rivers along the coast where the water is of suitable density more or less area of oyster reefs may be found. On account of the earlier settlement and the larger population in that vicinity, the reefs in Galveston Bay have been longer known and more extensively fished on than those of any other section. Matagorda Bay undoubtedly has at present the finest supply of oysters on the Texas coast, although the area of natural beds in that bay known to the fishermen is not so great as in Galveston Bay; but owing to poor shipping facilities, the Matagorda grounds are not so extensively fished on as those in other bays. Corpus Christi has recently acquired considerable prominence, and a greater development of the oyster resources of that locality is probable. The inland water route connecting the chain of bays from Matagorda to Corpus Christi will naturally unite the oyster business of the towns on the shores, enabling each market at all times to obtain a supply from any one of these bays.

The bottoms of the Texas bays may be classified generally as shifting sand, muddy, grassy, and hard. The shifting sand offers no

support whatever to the oysters, and permits them to sink and be covered; hence none are found on bottoms of this nature. The muddy ground is much better for their growth, and wherever oysters can gain "a footing" on such bottoms they will live and thrive, provided the density of the water be favorable. An excellent example of this is found in the extreme eastern arm of Matagorda Bay and in some parts of Mesquit Bay. However, these grounds are subject to an occasional deposit of mud, which may cover up and destroy the oysters. But where they are able to live, it will be found all along the coast that oysters on muddy bottoms attain a much larger and more rapid growth than those resting on other grounds, and the flavor is generally considered equally fine. But few oysters will be found on sea bottoms abundantly covered with vegetable life, because the grass, etc., covers up and smothers them even more effectually than the mud. Hard grounds form the natural resting-places for oysters, and wherever the water is suitable and the sea bottom is of this nature a generous supply of these mollusks will almost certainly be found.

After inspecting a large part of the oyster reefs and making careful inquiry of the best-informed fishermen, I estimate the area of the sea bottom in this State that has produced oysters during the last ten years as follows:

| Localities. | Total area. | Area of oyster-grounds. |
|--------------------------|-------------------|-------------------------|
| | <i>Sq. miles.</i> | <i>Sq. miles.</i> |
| Sabino Lake | 94 | 1 |
| Galveston Bay | 565 | 50 |
| Matagorda Bay | 440 | 45 |
| Espiritu Santo Bay | 61 | 6 |
| San Antonio Bay | 129 | 1 |
| Mesquit Bay | 23 | 3 |
| Aransas Bay | 103 | 15 |
| Corpus Christi Bay | 185 | 13 |
| Laguna Madre | 811 | 3 |
| | 2,471 | 137 |

It is believed that this area of 87,680 acres represents as nearly the extent of ground in Texas on which oysters have been found as can be obtained without an actual survey of all the reefs in the State.

It is interesting to note in this connection that an official report of the State of Maryland, the greatest oyster-producing region in the world, estimates the area of the natural oyster-grounds of that State, excepting those of the Potomac River, to be about 123,520 acres. The area of the natural oyster beds of Connecticut has by actual survey been determined to be 19,911 acres. The U. S. Fish Commission surveys made in 1891 show 773 acres now producing oysters in South Carolina. In 1888 the U. S. Coast and Geodetic Survey determined the area of natural oyster beds in North Carolina to be 8,237.9 acres, and in Georgia in 1890 to be 1,756.8 acres.

Many of the well-known natural oyster reefs in Texas have not been fished on for several years, and some have never been extensively resorted to, because other grounds are more conveniently situated from which the oystermen have been able to obtain a supply; and it is highly probable that there are large areas of oyster reefs within the bays along this coast of which the fishermen have no knowledge. No search for them has been made; the finding of the beds is in most instances caused by the centerboard of a boat grating on the oysters when the boat is sailing over the bed. The average length of the shafts used in the tongs is only 10 feet, and the fishermen do not ordinarily attempt to obtain oysters at a greater depth than 8 feet; consequently they know little of the animal life on deeper grounds.

VESSELS, APPARATUS, METHODS, ETC.

Making use of a local expression, when "grubbing oysters," or in other words when fishing for oysters, the outfit usually employed consists of one sailboat, one or two skiffs, a pair of tongs for each fisherman, several baskets, one or two small hammers for separating the clusters of oysters or culling, and the necessary outfit for cooking and living on board of the sailboats. The sailboats and skiffs employed do not differ from those in general use along the coast; only four of them measure over 5 tons, the total measurement of these four being 40.01 tons.

The oysters are taken either by means of tongs or are picked up by hand from such reefs as are exposed at low tide. During the season of 1890-91 one schooner, the *C. Highland*, used dredges experimentally for taking oysters at Corpus Christi. Dredges have not been employed in the other bays along the coast on account of the unevenness of the reefs and a lack of knowledge of the methods of handling these implements.

On April 11, 1891, a law was enacted prohibiting the use of any form of oyster dredge in the waters of this State. It is possible that the effect of this enactment may be injurious rather than beneficial. Dredges could undoubtedly be used with excellent results in many places, not only where the water is so deep that tongs are not available, but also where the oysters grow in ridges, which by action of the dredge are torn down and spread over a greater surface, thus furnishing a larger area for growth. An excellent example of this is found in the Choptank River, on the eastern shore of Maryland. In this river, prior to 1874, oysters were taken only by means of tongs. Since that time the use of small dredges in a large portion of that river has been permitted. By their action the reefs have been spread so as to cover the greater part of the river bottom, and the catch of oysters has been many times multiplied. If the taking of small oysters be properly regulated, the only manner in which dredges destroy a reef is by removing so many oysters that the reef is made lower than the surrounding mud and is covered thereby. But this "sinking" of a reef may be caused also by the use of tongs; and for every oyster reef on the Atlantic

coast that has been sunk by the use of dredges, grounds of much greater area have been made productive by the same apparatus.

The tongs used by the oystermen cost about \$6.50 per pair. The shafts are ordinarily from 8 to 10 feet in length, and the rakes have from 12 to 18 teeth on each side. Usually when taking oysters the sailboats are anchored over the beds and the tongs are used from the decks; but where reefs are exposed at low tide the oysters are picked up by hand and placed in the skiffs, which are dragged up on the reefs.

Generally the oysters are culled on the beds as they are being tonged, but at times this is done while the boat is running to market. Occasionally, particularly in Galveston Bay, oysters are tonged during a dull season and bedded in some suitable place to await a better market, the right of the owner to these being usually respected by his neighbors.

Prior to 1879 no restrictions were placed on this industry, but on March 8 of that year a law was enacted prohibiting the taking of oysters "from the 1st of May to the 1st of September in any year." On April 2, 1887, the "close time" was made "from the 1st of May to the 25th of August." On April 11, 1891, this act was repealed and the prohibited time reestablished as it was prior to 1887, "from the 1st day of May to the 1st day of September." Since 1887 there has been a law forbidding the taking of oysters in this State "less than 1½ inches in length net," but this law is not generally observed.

No license is required and the State receives no direct revenue from this industry, and is at no especial expense to support or protect it.

There are from two to four oystermen on each sailboat. The members of a crew fish on shares, and the boat and apparatus count as one man both in estimating expenses and profits. The captain does not receive a greater share of the profits than any member of his crew. The average annual income of the oystermen of this coast is about \$230.

Table showing the apparatus employed in the oyster industry in 1890.

| Localities. | Sailboats. | | Skiffs. | | Tonga. | | Total value. |
|-------------------------|------------|----------|---------|---------|--------|---------|--------------|
| | No. | Value. | No. | Value. | No. | Value. | |
| Galveston Bay..... | 127 | \$42,900 | 210 | \$2,140 | 210 | \$1,600 | \$40,640 |
| Matagorda Bay..... | 35 | 12,400 | 45 | 380 | 84 | 546 | 13,326 |
| Aranas Bay..... | 11 | 4,400 | 17 | 170 | 20 | 175 | 4,745 |
| Corpus Christi Bay..... | 13 | 6,100 | 13 | 130 | 40 | 260 | 6,490 |
| Laguna Madre..... | 3 | 450 | 3 | 25 | 4 | 25 | 500 |
| Total..... | 189 | 66,250 | 288 | 2,845 | 397 | 2,606 | 71,701 |

Table of products of the oyster industry for 1887, 1888, 1889, and 1890.

| Localities. | 1887. | | 1888. | | 1889. | | 1890. | |
|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Bushels. | Value. | Bushels. | Value. | Bushels. | Value. | Bushels. | Value. |
| Galveston Bay..... | 150,040 | \$57,425 | 323,825 | \$78,983 | 210,000 | \$70,400 | 235,300 | \$72,140 |
| Matagorda Bay..... | 46,000 | 10,000 | 53,700 | 15,450 | 60,000 | 19,800 | 109,350 | 29,200 |
| Aranas Bay..... | 20,400 | 4,100 | 21,000 | 4,250 | 26,400 | 6,600 | 26,550 | 6,600 |
| Corpus Christi Bay..... | 36,000 | 8,400 | 39,000 | 9,500 | 54,000 | 12,900 | 65,400 | 18,350 |
| Laguna Madre..... | 3,750 | 1,450 | 3,750 | 1,450 | 4,200 | 1,700 | 4,200 | 1,700 |
| Total..... | 250,199 | 88,275 | 341,275 | 109,633 | 300,600 | 111,400 | 440,800 | 127,990 |

THE CULTIVATION OF OYSTERS.

With the present abundance and the low prices of oysters in Texas, the necessity and facilities for their cultivation are not fully appreciated. On account of the regularity with which a "set" is obtained on the natural beds every year, there is not that urgent necessity for a system of private oyster-culture that exists in some of the Middle States. However, the policy of increasing the supply of oysters by permitting and encouraging the private ownership of suitable grounds for their growth is very properly being considered. Not only the members of the State legislature but the oystermen have advanced ideas on this subject.

The first oyster law operative in this State was enacted on March 8, 1879, with the following title: "An act for the preservation of oysters and oyster beds, and for protecting the rights of persons to the same, and affixing penalties." This bill provided for public and private grounds. All natural oyster beds in navigable waters were made public. All grounds, whether with or without oysters, in waters not navigable were made the exclusive property of the owners of the adjoining shores; and riparian owners were given control of all within 100 yards of low-water mark. Of the remaining grounds every person was given the right to preëempt without revenue to the State an area not exceeding 200 yards square (8½ acres), and no provision was made for return of the ground to the State. The taking of oysters from such preëmpted grounds or other private areas without permission of the owner was made a theft, punishable in accordance with the prevailing law for such crimes.

To persons acquainted with the jealousy with which the States bordering the Atlantic coast preserve their waters suitable for oyster-culture this may seem a very generous policy; but it is on a par with the same liberal spirit which this State has maintained for the settlement of her idle agricultural lands, which has resulted in such great prosperity. While one or two provisions of this law do not seem to be the best possible, the substance of the enactment is excellent; and had it continued operative, with an additional provision for systematic surveys and the return of the preëmpted ground to the State if not used after a certain term of years for the purposes proposed in the act, it would have provided for a steady and satisfactory growth of oyster cultivation. But as the natural beds continued to produce an abundant supply of oysters, few persons took advantage of the liberal provisions of this enactment, although it continued operative until 1887.

In the meantime much information was made public concerning what had been accomplished in oyster-culture in some of the Atlantic coast States, particularly in New York, Connecticut, and Rhode Island; and these reports, together with local factors, were influential in persuading the legislature in 1887 to pass another oyster bill, the provisions of which required the preëmptor to be an "actual bona-fide citizen" of the

State, and permitted him to take for his own use an area not exceeding 538 yards square (nearly 60 acres) and to hold the same for a period of twelve years. It also provided that no preëmption should be permitted "nearer than the extreme low-water mark in front of the shore or water-front of another" without the consent of the owner of such water-front. Within a short time after the passage of this bill many acres of oyster-grounds were preëmpted, and within four years papers had been filed for about 30,000 acres of ground situated in Galveston, Matagorda, Espiritu Santo, Aransas, and Corpus Christi bays.

No mention was made in the act of 1887 as to whether the preëmpted area may not be natural oyster-ground; neither did this enactment expressly repeal the act of 1879, though it seems to embrace much of the subject-matter of that act. Hence the doubt existed as to whether this last enactment permitted the preëmption of natural oyster beds. Many persons thinking that it did permit such preëmption spent time and money in obtaining bottoms of that description, as well as unproductive ground; these were chiefly persons interested in the marketing of oysters. Another class of men, mainly oystermen, while contending that the provisions of the act of 1879 prohibiting the preëmption of natural oyster-grounds was still operative, yet fearing that the courts might decide contrary to their ideas, took up such areas for their own protection. A third class contented themselves with taking up grounds on which oysters do not ordinarily grow, these being obtained partly for planting oysters, partly for speculative purposes, and some (particularly where the preëmptor owned the adjoining water-front) merely to keep out other persons.

This very unsatisfactory order of things existed when the State legislature met in the spring of 1891, and an attempt was made at that session to enact a satisfactory law, and the "oyster question" became of some prominence in Texas. This resulted in the enactment of the law at present in force, which provides for the preservation to the public of all the natural reefs and permits the preëmption by each bona-fide citizen for fifteen years of an area not exceeding 538 yards square (59.8 acres), not productive of oysters at the time of preëmption; the notice of preëmption to be filed for record with the clerk of the county in which the grounds may be situated, and its location to be designated among other things by "four buoys anchored or four stakes firmly and permanently planted, one at each corner of such location. * * * Said stakes shall project at least 4 feet above ordinary tides, and shall be not less than 6 inches in diameter if of wood or 3 inches in diameter if of iron."*

No ground has yet been obtained under this law; all the areas now held by individuals or corporations having been preëmpted under the

* It seems that this would materially interfere with navigation and serious objections would be made to permitting stakes 6 inches square to be "firmly and permanently planted" in navigable waters.

unsatisfactory enactment of 1887. The natural oyster beds preempted are fished on by the public without molestation; and of the remaining portion of the ground but a small area has ever been cultivated.

The most elaborate attempts at cultivation have been made in Galveston Bay. In 1889 and 1890 one oyster company secured several thousand acres of sea-bottom located partly in Galveston Bay and partly in Matagorda Bay. During the last week of April in 1890 about 6,000 bushels of oyster shells were planted for the purpose of obtaining a "set" on a part of the grounds in Galveston Bay. This is reported as being the first attempt of the kind made on the Texas coast. On May 10, of the same year, the shells were examined and found to have caught an abundant quantity of "spat." On August 2 following the young oysters were reported to be one inch and over in length. At the time of my visit, in January of 1891, it was found that they had lived well and would then "run" about 1,500 to the barrel.

In the winter of 1890-91 about 20,000 bushels of oyster shells were planted, but with what success is not yet learned. The private grounds in Galveston Bay are also used for planting the small or "cull" oysters obtained from the natural beds, about 45,000 bushels having been planted there in 1890. That was the first year in which this was done on so extensive a scale.

On the whole the cultivation of oysters in Texas waters gives every assurance of success. While the area of natural oyster beds is comparatively large, yet these reefs do not seem to possess as much recuperative power as the majority of beds on the coast of the Middle Atlantic States, and will more readily suffer from extensive fishing. The destructive spring freshets will also probably hasten the cultivation of oysters, by causing the fishermen to remove the young oysters from exposed places and to plant them in sheltered localities.

MARKETING OF FISHERY PRODUCTS.

At nearly all the fishing ports in Texas a number of men give their attention to the wholesale marketing of the products taken by the fishermen. These men have market houses (ranging in value from \$500 to \$10,000) located on the shores of the bays, from which piers 100 to 400 feet in length usually run out into the water. The products handled in these markets consist almost entirely of oysters and the catch made by the bay-seine fishermen, with at times a few flounders, catfish, turtle, and terrapins. The products of the other fisheries mostly find their way into local consumption without going through the wholesale markets.

Each marketman usually has a verbal agreement with a number of fishermen for the purchase of their catch at a price fixed for the season. He endeavors to so arrange the fleet that a certain number of boats may land their catch on each shipping day. When the fish are accepted by the dealer, the fishermen transfer them from the "live cars" to the market-houses. While doing so the "poor fish," that may have

been put in the cars while the seine was being emptied, are thrown away, and the "bulls" are placed to one side. The remaining fish are then weighed and turned over to the marketman at prices varying from 3 to 5 cents per pound, according to the locality and the season. For the "bulls" the marketmen generally give from 20 to 35 cents each, without regard to the weight.

All the fish are sent from the market-houses while fresh. In preparing for shipment, they are either dressed or left "round," to suit the demands of the customer. They are packed in boxes and barrels, and usually with two layers of fish and one layer of ice alternating, the fish being placed backs to backs and bellies to the ice. The prices received by the marketmen for the fish range from 5½ to 8 cents per pound, round weight. They are shipped mostly by express, and are marketed throughout Texas, Mexico, New Mexico, Colorado, Kansas, etc.

Nearly all the marketing is done on a c. o. d. basis, but few open accounts being kept. For expressage the transportation companies charge a fixed rate on the net weight of the fish, and add 25 per cent to that amount for the weight of the box and ice. They also re-ice the fish en route, when necessary, without extra charge.

Oysters are marketed in much the same manner and by the same houses that handle the fish taken by the bay seines. They are sold by the fishermen direct to the wholesale dealers. The price received for the oysters varies, according to the locality, from 50 cents to \$1.25 per barrel, which is the unit of measure. There is no very active competition in the business, and but little variation exists in prices throughout the season. Those sold at 50 cents per barrel are not closely culled. At Galveston, Corpus Christi, and Point Isabel the highest prices rule, while the lowest prices prevail in Matagorda Bay. On the reefs in the last-named bay as fine culled oysters as were to be found on the Gulf coast were sold in the season of 1890-91 at 60 cents per barrel; 90 cents is about the average price received by the fishermen throughout the State. In 1890-91 this average price was somewhat less on account of a large quantity of small and uncultured oysters being sold for planting on the preëmpted grounds around Galveston.

On account of the cost of transportation but few oysters are shipped from the coast in the shell, and prior to 1891 nothing had been done in the way of canning steamed oysters. The shucking is done by men and boys, who receive 25 cents per gallon, or in some places \$1.25 per 1,000, and at other marketing centers they are paid for the time employed. Some of the shuckers come every season from the Atlantic coast to engage in this work. The shucked oysters are shipped in pails holding from 1 to 10 gallons, and in hermetically sealed tin cans containing from 25 to 200 in number. They are sent to all parts of the country west of the Mississippi River, Kansas, Colorado, and Texas receiving the larger part. The trade is rapidly increasing, and the Texas oysters are successfully competing in those States with the product from the Atlantic coast.

The following table exhibits the number of men and the amount of capital employed in the wholesale marketing houses in 1890:

| Localities. | No. of houses. | Men employed. | Value of houses. | Cash capital. |
|----------------------|----------------|---------------|------------------|---------------|
| Galveston | 5 | 85 | \$63,500 | \$30,000 |
| Port Lavaca | 2 | 8 | 1,000 | 1,500 |
| Aransas Pass | 2 | 31 | 18,000 | 5,000 |
| Corpus Christi | 2 | 25 | 17,500 | 12,000 |
| Point Isabel | 1 | 2 | 500 | |
| Total | 12 | 151 | 100,500 | 48,500 |

Prior to 1891, the only permanent establishment for canning or otherwise preserving fishery products, was a turtle cannery at Fulton, on the shore of Aransas Bay. About 1879, a factory for canning shrimps was erected at Galveston Bay, and operated for one or two years. While the beef-packeries were in operation at Aransas Bay some green turtle were canned there; and in 1880 a small factory for canning fish was erected at Rockport, now called Aransas Pass, but it was in operation only a short time. In the spring of 1891 factories for canning oysters were established at Galveston and Corpus Christi.

The difficulty in disposing of an oversupply of fish, even at a reduced price, at present militates against the successful prosecution of the fisheries of this coast. As yet, no one in the State makes a business of salting fish. The general opinion along the coast is that on account of the climate it is impracticable to salt the fish so that they will keep for a reasonable length of time. But for many years trout, redfish, sheepshead, mullet, etc., have been successfully preserved in this manner in Florida; indeed, some of the fishing communities of that State depend for support almost entirely on the sale of their salt fish; and it seems that equal care would insure success on the Texas coast.

The drying of fish after the manner practiced in the Barataria region of Louisiana might be resorted to with some success along portions of this coast.

While some of the fish markets have ice manufactories connected with them, by means of which the fish are kept for a few days, yet preserving fish in cold storage for many weeks, as is done particularly along the shores of the Great Lakes, has never been attempted in Texas nor in any of the other States bordering on the Gulf of Mexico. It is a question whether, with the present ruling prices, it will pay to add this feature to the marketing of the more plentiful species of fish occurring here, although it might be done with the higher-priced ones.

Another drawback to the prosperity of the fisheries is the difficulty experienced in marketing many of the varieties of fish taken, which consequently are thrown away as soon as caught. Among these might be mentioned mullet, drum, and other good edible fish which are taken in large quantities, but against which local prejudices exist.

PROTECTION AND CULTIVATION OF FISH.

As in the other States bordering the Gulf of Mexico, little attention has been given to the cultivation and preservation of fish in Texas, and this special branch of legislation seems to have been quite ignored in the State until 1879. On April 17 of that year a bill was enacted "for the preservation of fish and to build fishways and fish-ladders." This act required that all persons who six months after its passage might erect any milldams or other obstructions in the waters of the State should construct fish-ladders and keep them in repair so that at all seasons of the year the fish might ascend above such obstructions to deposit their spawn. Further provision was made in this act for the appointment by the governor of a fish commissioner to serve without compensation, who should see that all individuals and corporations constructed and kept in repair such suitable fishways. As no appropriation went with this enactment, either to encourage fish-culture or to compensate the commissioner, little benefit could be expected.

During the next session of the legislature, which occurred in 1881, another enactment was made providing a salary for the commissioner and appropriating \$5,000 annually for the following two years, to be expended in the cultivation and distribution of fish in the rivers and ponds of the State. The amount appropriated for this purpose for the two years following the session of the legislature in 1883 was \$10,400.

By act of March 20, 1885, the office of State fish commissioner was abolished, and an appropriation was made during the same session for winding up the affairs of his office. Since that time the State government has made no special effort to stock the waters with fish.

Shortly prior to and during the few years following the enactment of 1881 numbers of young shad, salmon, rainbow trout, carp, etc., were planted, chiefly for experimental purposes, in Texas waters by the U. S. Fish Commission. The shad were placed mostly in the Sabine, Colorado, Brazos, San Antonio, and Trinity rivers. But few instances have been reported of the return of any of the shad here planted. The few California salmon deposited seem to have entirely disappeared. The rainbow trout are reported as having done well. The carp-planting has been a complete success; the rivers, being mainly sluggish and muddy, seem to be fully adapted to this fish.

In the spring of 1890, 745 lobsters, from 7 to 10 inches long, were sent to Galveston by the U. S. Fish Commission to be planted in the Gulf near that city; while it is reported that two or three of these have since been obtained, the experiment can not be considered a success.

The stocking of the streams in Texas with fish is a subject of much importance, of which fact the General Government has recently shown its appreciation by providing for the establishment of a hatchery in the interior of the State. With much of her territory far removed from salt water, and with a length of river course probably greater than that of any other State in the Union, superior inducements are offered for the cultivation of fresh-water fish.

GEOGRAPHICAL REVIEW OF THE FISHERIES.

GENERAL DESCRIPTION OF THE COAST.

The length of the Texas coast line, following its sinuosities, is about 2,000 miles, but in a direct line it is a trifle less than 400 miles. The mainland is for the most part bordered by a chain of low sandy islands and peninsulas, each having the same general trend as the coast, the most important of which are: Bolivar Peninsula, Galveston Island, Matagorda Peninsula, Matagorda Islands, St. Joseph Island, Mustang Island, and Padre Island. On nearly all of these there are a few scattering houses, the homes of men employed in fishing, cattle-raising the Life-Saving Service, etc. There are no important settlements, however, on any of them except Galveston Island, on which the city of Galveston is located.

Between the mainland and the outlying chain of islands and peninsulas are situated a number of bays, viz, Galveston, Matagorda, Espiritu Santo, San Antonio, Mesquit, Aransas, Corpus Christi, and Laguna Madre; also Sabine Lake, in the extreme eastern part of the State; this, however, is an extension of the Sabine River, rather than a bay. The combined area of these bays with their estuaries is 2,471 square miles. In nearly every instance the outlets of the bays are situated at the extreme southwest end.

From Matagorda Bay through Espiritu Santo, San Antonio, Mesquit, and Aransas Bays to Corpus Christi Bay, a distance of 130 miles, there is an inside route permitting the passage of vessels drawing 3 feet of water and connecting advantageously the industries of these six bays. The remaining bays, Galveston Bay, Laguna Madre, and Sabine Lake are isolated and without inland water routes.

SABINE LAKE.

The easternmost fishing locality in Texas is Sabine Lake, which forms a part of the boundary line between this State and Louisiana. This lake is merely an expansion of the Sabine River just before its entrance into the Gulf of Mexico. Its southernmost end is about 4 miles from the Gulf, with which it is connected by a channel known as Sabine Pass. The length of the lake is 19 miles, its greatest width about 9 miles, and the area is 94 square miles.

Sabine River is about 400 miles long and forms about 200 miles of the boundary line between Louisiana and Texas. Three miles below the mouth of the Sabine River the Neches empties into Sabine Lake. The length of this river is about 270 miles. Both of these rivers drain a large area of territory. Hence the water of Sabine Lake is comparatively sweet, especially during the spring freshets.

Little attention is given to fishing, not more than a sufficient supply for local consumption being taken. Seines, cast nets, trot lines, and hand lines are used to a limited extent. Fourteen men depend on the fisheries for a living, and twenty others engage in them at times. The catch of fish in 1890 amounted to 71,700 pounds, for which the fishermen received \$4,038.

On Taylor Bayou and at Keath Lake Gully are located two companies of seine fishermen, each company using one small sailboat of about 3 tons. During the winter the catch consists mostly of catfish, buffalo or suckers, and fresh-water drum. In the summer, when the water in the lake is not so fresh, the most abundant species taken are redfish, trout, and sheepshead. The bay-seine fishermen are reported as taking in their seines about 100 dozen terrapins annually.

In the winter and during the spring freshets half a dozen men living at the head of the lake fish for catfish with trot lines. From 150 to 500 hooks (about 4 feet apart) are attached to each line. The length of the snoods is about 18 inches and the cost of such lines ranges from \$3 to \$10. About 12,000 pounds of fish are annually taken in this manner. The average weight of the catfish is about 20 pounds, while some attain a weight of 75 pounds. The number of trot lines in use at present is not so great as it was seven or eight years ago, but there were no seines used here at that time.

A few cast nets and hand lines are at times used by men living on the shores of Sabine Lake, the catch being only sufficient for home consumption. The quantity taken annually by means of hand lines is about 10,000 pounds; the catch by cast nets is much less, amounting probably to about 3,000 pounds.

On account of the slight density of the water no oysters are found here, except occasionally in the lower end of the lake. In 1887 some were found which were almost large enough for market, but they were destroyed by the freshets in the spring of 1888. The reefs on which these oysters appear are at the extreme southern end of the lake and directly in the "pass." They cover an area of from 2 to 3 miles long and about three-quarters of a mile wide, the length running north and south.

GALVESTON BAY.

Leaving Sabine Lake and going southwestwardly along the coast there are no fishing localities until Galveston Bay is reached, a distance of about 60 miles. Between Sabine Lake and Galveston Bay the coast is entirely without harbors, and is uninhabited except by ranchmen.

Galveston Bay is the second largest in area and commercially the most important of the bays on the Texas coast. It lies between the mainland and Galveston Island and Bolívar Peninsula. East Bay, Trinity Bay, and West Bay are tributary to Galveston Bay. Much of the waters of West Bay, however, find an outlet into the Gulf of Mexico

through San Luis Pass. East Bay lies between Bolivar Peninsula and the mainland. It is 15 miles long and varies in width from 1 to 7 miles. The average depth of water in this tributary is from 5 to 7 feet. Trinity Bay lies north of Galveston Bay, and into this tributary the Trinity, San Jacinto, and smaller rivers empty. On account of its distance from the sea and the number of rivers emptying into it, the waters of Trinity Bay are quite fresh. The average depth of water in this tributary is between 9 and 11 feet. West Bay separates Galveston Island from the mainland, and is about $2\frac{1}{2}$ miles in breadth and 23 miles in length. It is very shallow, being at no point more than 7 or 8 feet in depth and in some places is forded by cattle. Oyster Bay, sometimes called Christmas Bay, is a tributary of West Bay, and most of its waters find outlet through San Luis Pass. The area of Galveston Bay and its tributaries is estimated at 565 square miles, Laguna Madre with an area approximating 811 square miles being the only larger body of water in Texas.

The abundance of fish in Galveston Bay seems to have somewhat decreased during the past several years, and the crews seining here catch on an average a less quantity per seine than those in the other important fishing sections along the coast. Although quantities of fish are shipped into the interior from Galveston Bay, yet at times the catch is not sufficient to supply the local demand, and large consignments are received from other fishing ports. The great bulk of the catch is sold at Galveston City, but occasionally some of the boats run up Buffalo Bayou and dispose of their catch at Houston, while a few fish are sold at Wallisville, Harrisburg, and other villages on the shores of Galveston Bay. More of the so-called "cheap fish" are saved by Galveston Bay fishermen than elsewhere along this coast. This is due to the larger local demand among poor people.

The total number of professional fishermen living around Galveston Bay and its tributaries in 1890 was 440. Of these, 284 lived on the island of Galveston, 52 on Bolivar Peninsula, 48 at Buffalo Bayou and Oyster or Christmas Bay, and some on the mainland between Virginia Point and Chocolate Bayou. All of these men depended on oystering and fishing for a living, except those on Bolivar Peninsula and on the middle and western part of Galveston Island, who gave attention to truck farming as well as to the products of the bay. Besides these regular fishermen, about 150 men engage at times in fishing with cast nets, crab pots, etc., and 96 men were constantly employed in transporting and marketing the fishery products.

The fisheries prosecuted.—The bay-seine fishery and the oyster industry are the two principal fisheries prosecuted in this locality, and the persons engaging in one of these do not as a rule engage in the other. Several minor fisheries are also carried on, as the surf-seine the shrimp, flounder, crab, and cast-net fisheries, and the line fishery for red snappers and other fish.

The bay-seine fishery.—In 1890 there were 165 men employed in the bay-seine fishery. They used 60 seines valued at \$7,550, 58 sail craft worth \$19,690, and skiffs and life cars to the value of \$3,150. The catch amounted to 1,418,500 pounds, for which the fishermen received \$72,999. Of the sail craft, only two measured over 5 tons, the combined tonnage of these being 12.93 tons.

The wagon or surf-seine fishery.—In 1890 twelve "wagon" or surf seines were owned and fished here chiefly by the truck farmers, who sold their produce in Galveston. No boats are used in this fishery, and the catch is hauled to market in wagons; hence the name for this fishery. The surf seines are made nearly similar to the bay seines; the chief difference is that they are not quite so long, being only 50 to 60 fathoms in length. The depth is from $4\frac{1}{2}$ to 6 feet, and the value is about \$80 each. They are hauled in the surf on the south side of the island, and two men are required to each seine. The catch, which amounts to about 40,000 pounds in each year, consists principally of sand trout (*Cynoscion nothus*), croakers, and large redfish, with a much smaller quantity of many other species. As these species are found in greater abundance in the bays, this fishery has not become very important. The fishermen, or in many instances their wives, take the catch to Galveston, where they sell it from house to house about the city. On account of the manner in which they are disposed of, these fish usually return to the fishermen a higher price per pound than those taken by the bay seines. Galveston Island is the only place in Texas at which these seines were found in use.

Spearing of flounders.—Flounders are taken from the waters of Galveston Bay at night by the method known as "jacking," which is practiced all along the Atlantic coast. No one depends on this fishery, and it is prosecuted only during the summer months. About 30 men around Galveston Bay engage in it at times. The men go out in the shallow water "afoot," carrying a torch in one hand and a spear in the other. When a flounder is discovered it is picked up by means of the spear and placed in the bag or basket carried on the arm holding the torch. The quantity of flounders taken annually in this manner in Galveston Bay is about 25,000 pounds, and the price received by the fishermen is about 6 cents per pound. There is always a good demand in the markets for these fish.

The cast-net fishery.—About ninety-five cast nets are operated by as many persons from the docks, etc., around Galveston. These nets are worth on an average about \$3.75 each, the value ranging from \$2 to \$8, according to the size, which varies from 4 to 10 feet in diameter. The nets are used only at odd times by the wharf laborers and other persons when work is slack. The catch amounts to about 28,000 pounds annually and consists chiefly of mullet, with a small quantity of other fish and some shrimp. When not consumed at home the fish are generally peddled about the city by the fishermen, who receive on an average about 6 cents per pound for them.

The hook-and-line fisheries.—Aside from the red-snapper fishery, but few fish are taken by hooks and lines in the vicinity of Galveston, and these mainly by sportsmen and wharf-idlers, the latter usually fishing off the docks with short lines. Occasionally some fish are taken in the surf on the south side of Galveston Island by means of long hand lines. The method employed is common on the Atlantic coast from New Jersey to Florida for taking many varieties of fish. The line is several hundred feet in length, and has a hook and weight at one end. The other end is fastened to a peg driven in the sand near the water's edge, or to one arm of the person using it. After coiling the line on his arm the fisherman goes back a hundred feet or more from the water. Then, running rapidly toward the surf and swinging the weighted hook around his head, he throws it far out into the water. Immediately the line is drawn in, either hand over hand or by the fisherman running up the bank. The fish taken in this manner are usually much larger than the average of the same species taken in the seines. The most abundant are redfish, trout, and occasionally bluefish, the latter species being more numerous during the last three or four years. The quantity taken in this manner and from the bay is about 35,000 pounds annually.

It was formerly customary for a number of the harbor and freight boats around Galveston to make several fishing trips during the year to the red-snapper banks off Galveston Island. Ordinarily these trips were made during the dull season and were engaged in as much for pleasure as for profit. Some of the boats, however, made quite a business of it. In this way, during certain years, as much as 200,000 pounds of red snappers were brought to Galveston. This fishery began about 1881 and reached a maximum in 1885. The schooner *Edna C.*, tonnage 23.06, was one of the best boats engaged in this fishery, but during a storm on September 18, 1885, while on a trip to the banks, this vessel was lost with all on board. Since then few boats have engaged to any extent in taking red snappers. In each of the years 1887, 1888, and 1889 there were three regular freight vessels that made trips to the banks, while in 1890 there were only two such vessels. The crew usually consisted of five men to each vessel. The catch of 1889 was reported to be 22,000 pounds, while in 1890 it was only 4,800 pounds.

The oyster industry.—Galveston Bay has a greater area of natural oyster beds than any other bay in Texas, but the reefs are not so plentifully supplied with oysters as some others in the State. This is to some extent due to overfishing. In 1890 215 men living on the shores of Galveston Bay were engaged in oystering, using 127 sailboats valued at \$42,900, and other apparatus valued at \$3,740. The catch amounted to 235,300 bushels of oysters, for which the fishermen received \$72,140. A small part of this catch was obtained from Matagorda Bay by Galveston oystermen who fished there for a few weeks. None of the sail craft employed in the oyster fishery of Galveston Bay measure over 5 tons.

The best grounds in Galveston Bay proper lie off Shoal and Dollar points on the western side of the bay, and off Stevenson and Smith

points on the east side. The opening of the canal from Brazos River to West Bay is supposed to have had a beneficial effect on the oysters of that bay, as the fresh water constantly flowing in preserves an equality in the density of the water of that region.

It is estimated that there are about 50 square miles of natural oyster-grounds in Galveston Bay and its tributary bays. The quantity of oysters taken from this area varies greatly, depending largely upon the facilities for obtaining a supply from Matagorda Bay, Morgan City, and elsewhere. In 1890 about 50,000 bushels of uncultured oysters were taken from the natural reefs for planting purposes, thus advancing the catch for that year slightly beyond its usual proportions.

The following table exhibits the quantity of oysters taken during each of the past four years by the oystermen of Galveston Bay:

| Year. | Bushels. | Value. |
|-----------|----------|----------|
| 1887..... | 155,000 | \$60,050 |
| 1888..... | 220,000 | 78,000 |
| 1889..... | 210,000 | 76,400 |
| 1890..... | 235,300 | 72,140 |

The shrimp fishery.—Ten to fifteen years ago many shrimp were found in Galveston Bay, and a factory was erected for the purpose of canning them. In 1880 this establishment prepared 75,000 1-pound cans of shrimp, but a great decrease in the quantity necessitated the closing of the factory a few years later, and at present only enough are obtained for daily supply in the local market. These shrimp are taken by seines similar to the ordinary bay seines, except the mesh is much smaller. There were ten of these seines in use in Galveston Bay in 1890. Their average value is about \$75, and the services of two men are required for the operation of each one. One small sailboat worth about \$80 is used by each "shrimping" crew. The fishery is prosecuted in much the same manner as the bay-seine fishery: According to reports, the catch during the past ten years has steadily decreased. In 1888 it was 15,000 buckets, in 1889 it was only 13,500, while in 1890 it was still further reduced to 9,200 buckets. They are sold fresh, the wholesale price ranging from 35 to 55 cents per bucket, about 15 pounds to the bucket. The average size of these shrimp is scarcely so great as of those taken in the Baratavia region of Louisiana, or at Tampico in Mexico, at each of which places large quantities are obtained.

The crab fishery.—While the taking of crabs in Galveston Bay is scarcely considered an industry, yet from 25,000 to 30,000 dozen are annually caught in trap nets and by hand lines. About 75 crab traps, worth about \$4 per dozen, are used, as well as a quantity of short, cheap hand lines. The crab traps are made in a rough manner by the persons who fish them; the ordinary form consists of a barrel hoop, to which is attached a net bag. Bait is tied in the center of the hoop, and the trap is lowered from the wharf, to which it is fastened by means of a

small cord. A number of times daily it is visited, raised, and the catch removed. The crabs are fished for by the negroes and the poor people about the wharves, who for the time find nothing else to do. The catch is usually peddled around the city, the price received averaging about 15 cents per dozen.

Fish and oyster markets.—The only wholesale fish and oyster markets on the shores of Galveston Bay are located at the city of Galveston, where there were in 1890 five wholesale dealers who handled these products. Besides these there were at Galveston also many others who handled oysters to a limited extent, while nearly all of the groceries in the city, as well as many restaurants, received from one to ten barrels daily from the fishermen. The property occupied by the five wholesale houses in that year was valued at \$63,500, and 85 men were given employment.

When taking their catch to market the greater number of the Galveston fishermen run their boats into "vegetable slip," where the catch is sold in open market either to the wholesale dealers or to the many retail grocers or restaurant keepers.

It is an interesting sight to see the fishermen together with the truck-farmers who take their produce to market in small sailboats, as they congregate at their respective places in the "slip" every morning while awaiting buyers for their wares. In this place at times there may be counted nearly a hundred sailboats, constituting a regular "mosquito fleet." The list of their produce for sale is almost endless. One may find here a load of oysters, there potatoes, in another boat cauliflower and pigs, chickens here and terrapins there, ducks and crabs, fish and milk.

For oysters the marketmen pay from 75 cents to \$1.50 per barrel, the average in 1890 being about \$1. The greater part of the oysters were handled by the Galveston Packing Company, which, in addition to those secured from this bay, obtained large supplies from Matagorda Bay. The oysters are sold by the marketmen in various quantities and conditions. The local demand usually requires oysters in the shell, while the inland trade is mostly for the opened oysters. When sold in the shell the unit of measure is the barrel, holding about 3 bushels; the opened oysters are sold by the number, although there is a growing tendency to sell by the gallon. The openers are generally paid at the rate of \$1.25 per 1,000, but one house has begun, instead, to pay 25 cents per gallon of solid meats. As the oysters are opened they are separated into two grades, selects and standards. They are then placed with ice in tubs holding from 1 to 5 gallons, or in tin cans, the capacity of which ranges from 25 to 200 oysters. The tin cans are hermetically sealed and shipped in boxes containing ice. They are sent into the interior by express, and the trade, which is growing rapidly, extends throughout Texas, Kansas, Nebraska, Colorado, and other Western States, and even so far distant as Chicago.

For most of the fish the wholesale marketmen usually give 6 cents per pound in the winter, and during the summer months sometimes as low as 4 cents per pound, and even less. These prices are for round fish. When shipped inland they are packed in ice and sent by express. The pompano, Spanish mackerel, flounder, robalo (*Centropomus undecimalis*), and a few other choice varieties, are sold almost entirely for consumption in the city, and at fancy prices, often as much as 50 cents per pound being obtained for some of them. The marketing houses also handle shrimp, turtle, terrapins, etc., as they may be taken by the fishermen, which is always in limited quantities.

MATAGORDA BAY.

Leaving Galveston Bay and going westward along the coast, at the mouths of most of the estuaries there are a few oyster reefs, from which at times the people living at the scattering hamlets and plantations obtain a "mess" of oysters. At Oyster Creek, Brazos River, San Bernard River, and Caney Bayou a few fish are taken by means of lines; but no established commercial fishery is met with until Matagorda Bay is reached, the entrance to which (Pass Cavallo) is about 125 miles from Galveston City.

This bay is inclosed between Matagorda Peninsula and the mainland. Its only channel to the Gulf of Mexico is through Pass Cavallo, which affords uncertain passage for vessels drawing 9 feet of water. Matagorda Peninsula, which separates Matagorda Bay from the Gulf, is 50 miles long and varies in width from a few rods to 1½ miles. It is quite low and sandy, and is in many places subject to an occasional overflow, permitting the waters of the bay to unite with those of the Gulf of Mexico.

The Colorado, Navidad, Lavaca, and other rivers, all combined draining an area of over 50,000 square miles, empty their waters into Matagorda Bay. This would render the water in the bay quite fresh, were it not for the large channel at Pass Cavallo.

Matagorda Bay is about 53 miles long, and the width varies from 2 to 14 miles. With its tributaries, Lavaca, Carankaway, Trespalacios, and smaller bays, it covers an area approximating 440 square miles. The depth of water in the bay varies from a few inches to 14 feet. It averages from 10 to 12 feet, except in the eastern end of the bay, where the ordinary depth is from 4 to 8 feet. Under the influence of a strong southeast wind this bay becomes exceedingly rough, and during the last six years more fishing boats have been wrecked here than in all the remaining bays on the Texas coast.

The fisheries prosecuted.—The extent of the fisheries of Matagorda Bay has varied with the prosperity of the towns along its shores, and at no time has it been so great as the bay is capable of sustaining. The fish and oyster trade in 1884 and 1885 reached considerable proportions, but owing to the abandonment of the bay by the Morgan line

of steamers in 1886 it very considerably decreased in the years following. In 1890 the fisheries of this bay gave steady employment to 109 men and supported 30 others for a few weeks. The property invested in the fisheries was valued at \$18,196. The total weight of fishery products amounted to 893,200 pounds, for which the fishermen received \$33,693. Of this amount \$29,200 was obtained from the sale of oysters, the taking of which constitutes by far the most important fishery in the bay. The bay-seine fishery, although of little importance, ranks second in extent among the fisheries of Matagorda Bay. A few cast nets are used, and some hook-and-line fishing is done.

The bay-seine fishery.—Seventeen men sailing from Port Lavaca engaged in the bay-seine fishery in 1890. They used five sailboats, valued at \$1,650, and seines, skiffs, and live-fish cars to the value of \$610. The catch in that year amounted to 102,750 pounds, for which the fishermen received \$3,593. In 1889 an equal force was employed in this fishery, and the catch amounted to 88,800 pounds, valued at \$3,110. The fishing-grounds are situated in the shoal waters of Matagorda Bay and its estuaries, and in the eastern part of Espiritu Santo Bay. The catch is landed at Port Lavaca, from which place it is distributed throughout the State by the wholesale dealers. Every year several crews of seine fishermen from Galveston go to Matagorda Bay to fish, sending their catch home by the steamer *Cumberland*. The supply of fish is much greater than the present market demands, and the fishermen are frequently idle for several days at a time because the markets are overstocked.

Cast-net, hook-and-line, and other fisheries.—About thirty cast nets are used at times on the shores of Matagorda Bay by the regular seine and oyster fishermen and by other persons. The catch consists chiefly of mullet, shrimp, and a few trout (squeteague), and amounts to about 15,000 pounds annually, the usual price for which is 3 or 4 cents per pound. No commercial hook-and-line fishery has been established at Matagorda Bay, yet about 10,000 pounds of various species of fish are annually taken by sportsmen and others. These consist chiefly of red-fish, trout, jewfish, etc., and the catch is almost entirely used for home consumption.

Quantities of green turtle are taken in Matagorda Bay by the Aransas Bay fishermen, but no one living in this section engages in fishing for them. Shrimp also are found, but except the few taken in the cast nets none are brought to the settlements.

The oyster industry.—The finest oyster reefs in Texas are located in Matagorda Bay. The total area of productive grounds in this bay at present known to the fishermen approximates 45 square miles. There are doubtless many beds which have not yet been discovered. The best-known oyster-grounds are Tiger Island reef, Trespalacios reef, Old Town grounds, and those in the extreme eastern section of the bay, which are sometimes known as the Live Oak grounds.

The oysters obtained from Tiger Island reef are probably not surpassed by any on the Texas coast, either in abundance, condition, or shipping qualities. This reef is located about 3 miles from the mouth of the Colorado River, and about 28 miles from Pass Cavallo, the outlet of the bay, and where the fresh water from the river mingles with the salt water of the bay. The depth of water on this reef ranges from 6 inches to 6 feet. Indeed, at times during the prevalence of a strong northeast wind some portions of the reef are uncovered with water for several days, and yet the oysters continue in excellent condition. The formation of the shell of the oysters on this reef is somewhat peculiar. It is rather smooth on the outside, is very hard, quite deep and massive, without sharp edges, and somewhat resembles the shell of the quahog or southern clam. This is doubtless largely due to the great quantity of lime in the water. Many of the counties in the valley of the Colorado River are noted for their liberal deposits of limestone, and great quantities of it are washed down the river and over these oyster-grounds.

The Trespalacios grounds are located about 15 miles W. by SW. from Tiger Island reef and just north of Half Moon reef. The oysters on these grounds differ in many respects from those of Tiger Island reef; they are longer, with rougher shells, and usually are not in so good condition. It is reported that several years ago the oysters on Trespalacios grounds "died out," on account of an overabundance of fresh water. After that time oysters were not fished for on these reefs until the spring of 1891, when a few were taken.

The Old Town grounds are located off Old Town, a short distance north of the former site of Indianola. Prior to 1875 very fine oysters were obtainable from these reefs, but they gradually disappeared and the location of the reefs was almost forgotten. During the winter of 1890-91 it was discovered that these beds were again productive and they were fished on at the time of my visit. These oysters resemble in appearance and flavor those obtained from the Trespalacios grounds.

In the muddy grounds east of the Tiger Island reef many clusters of very large oysters are found. These grounds are frequently called the Live Oak or East Matagorda grounds. They cover a large area, but the oysters are very much scattered. These oysters are finely flavored and very large, some of the individual meats weighing 4 ounces or more.

On account of the small demand and the poor marketing facilities, the oyster industry of Matagorda Bay has not reached a full development. The home market requires only a small quantity. The nearest shipping-point to the Tiger Island reef is Port Lavaca, over 40 miles distant, and the facilities offered at that point are limited.

The number of men living on the shores of Matagorda Bay and engaged in taking oysters in 1890 was reported to be 84. They used 35 sailboats valued at \$12,400, and 45 skiffs which, with the tongs used, were valued at \$926. The catch amounted to 109,350 bushels of oysters, for which the fishermen received \$29,200.

The following table shows the catch of oysters during the past four years by the fishermen of this bay:

| Year. | Bushels. | Value. |
|-----------|----------|----------|
| 1887..... | 48,000 | \$13,000 |
| 1888..... | 53,700 | 15,450 |
| 1889..... | 65,850 | 19,800 |
| 1890..... | 109,350 | 29,200 |

Many oysters have also been obtained from this bay during each of the past four years by men hailing from Galveston, Aransas Pass, and Corpus Christi; but their catch has been included in the figures for the localities in which the oystermen lived.

Marketing houses.—The only wholesale fish and oyster markets on the shores of Matagorda Bay are the two located at Port Lavaca. Here 8 men are employed and the value of property occupied is about \$1,000. The quantity of fishery products handled is quite small, and the marketing methods employed do not materially differ from those practiced at other points on the coast. As a site for an oyster cannery this bay is probably not surpassed by any on the coast of the Gulf of Mexico. The best oysters gathered there in 1890 were sold on the reefs at 60 cents per barrel to vessels making occasional trips, and if the oystermen could have disposed of their catch every night they would doubtless have been willing to accept 50 cents per barrel at the reefs. These oysters cost delivered at Corpus Christi and Galveston about \$1 per barrel.

ESPIRITU SANTO BAY.

Espirito Santo Bay, which lies southwest of Matagorda Bay, is 15 miles long and averages about 4 miles in width. Including its tributaries, Shoalwater Bay, Pringes Lake, etc., its limits extend over an area of about 61 square miles. It probably contains more islands than any other bay on the Texas coast. By means of two bayous it has outlet into Pass Cavallo, the outlet of Matagorda Bay. No rivers empty into Espirito Santo Bay, but at its western end it receives the greater portion of the fresh water of San Antonio Bay, consequently the water here is quite fresh, and oysters occur only in very limited quantities, if at all. In the eastern half of the bay, where the water is not so fresh, the conditions are very favorable to oysters. The depth of water in this section is from 1 to 8 feet, and averages about 5 feet. In this shoal water ordinarily the ground is not muddy and appears to be quite free from shifting sand. The area of the oyster reefs is approximated at 6 square miles.

No settlements exist on the shore of Espirito Santo Bay. The seine fishermen from Port Lavaca, and occasionally those from Aransas Bay, fish here. Port Lavaca is about 25 miles distant and Aransas Pass

about 50 miles. This bay has a local reputation for an abundance of fish, but is rather far from marketing centers.

SAN ANTONIO BAY.

Directly west of and emptying the greater portion of its waters into Espiritu Santo Bay lies San Antonio Bay. Its area approximates 129 square miles. Into it empty the Guadalupe and San Antonio rivers and smaller streams. The waters of the bay are comparatively fresh and no oyster reefs whatever are found there, except in the extreme western portion, the oysters of which are frequently destroyed by spring freshets, and are rarely taken by the fishermen.

On the Guadalupe River, a few miles above its mouth, some catfish are taken by fishermen from Aransas Bay. Aside from this, because of the lack of settlements along the shores, there are no fisheries prosecuted in San Antonio Bay. Its fresh water will probably prevent the ordinary fisheries of this coast from ever being extensively carried on here.

MESQUIT BAY.

This beautiful sheet of water forms connection between San Antonio and Aransas bays, and covers an area of about 23 square miles. Besides its outlet into Aransas Bay, it has a narrow passage to the Gulf of Mexico through Cedar Bayou. The depth of water is from 1 to 6 feet, and averages about 4 feet; but in the channel among the islands a depth of 15 or more feet may be found. The bottom is mostly covered with thick mud. There are several shoals or narrow places in the channel through this bay that very much impede navigation and frequently cause even the shallow fishing craft to await a higher tide or a change of the wind.

In many places in this bay are found small reefs from which fine oysters may be obtained. In fact, wherever the ground is sufficiently firm for the oysters to "gain a footing" they appear to do well. At low tide one may go on many of the small exposed reefs and pick up a bushel or more of oysters. Instances are reported in which 30 bushels of fine oysters have, in three hours, been picked up by one man from an area less than 100 feet square. Cedar Bayou, which connects this bay with the Gulf of Mexico, produces some of the largest oysters found on the coast of the Gulf States, and their flavor is excellent; many of these are so large that less than 80 will fill a 3-bushel barrel. The reefs of other localities are better known and less difficult of access, and those of Mesquit Bay and Cedar Bayou have, therefore, received little attention. When the oyster industry of Texas has been fully developed, it is probable that Mesquit Bay will be one of the best places along the coast for bedding and growing oysters. There are no towns on the shores of this bay, hence such fish as are obtained from the waters thereof are taken by men living in other localities.

ARANSAS BAY.

Aransas Bay lies southwest of Mesquit Bay and empties its waters into the Gulf of Mexico through Aransas Pass. The Mission, Aransas, and other rivers, all together draining an area of about 2,200 square miles, empty their waters into this bay. One of its tributaries, Copano Bay, nearly equals it in area. It also has several smaller estuaries, viz, St. Charles Bay, Mission Bay, Puerto Bay, Shallow Bay, etc. The area of Aransas Bay and its tributaries is 163 square miles. Its greatest length measures nearly 20 miles, and the average width of the bay proper is about 5 miles. Its largest tributary, Copano Bay, is about 13 miles long and 5 miles wide.

The depth of water in Aransas Bay proper ranges from a few inches to 14 feet, the latter depth being found in front of the city of Aransas Pass and about $1\frac{1}{2}$ miles from shore. The average depth of water is about 10 feet. Southwest of Goose Island and from $1\frac{1}{2}$ to 2 miles distant there is a channel 30 feet deep.

In the eastern portion of the bay there are a number of reefs over which the depth of water ranges from a few inches to 6 feet. The most prominent of these reefs are Grass Island, Half Moon, Long, Pelican, and Poverty reefs. In Copano Bay, the northern portion of Aransas Bay, the depth of water does not exceed 10 feet and the average is not more than 7. In this tributary are Shell Bank reef, Copano reef, Lap-Reef bank, and Lap reef; these reefs are narrow, but extend several miles in length. As there is little depth of water over them they materially affect the navigation of the bay even by small fishing craft.

Importance of the fisheries.—Since the abandonment of the beef-packing business about 1880, and up to the present time, the fisheries have been the most important of the industries prosecuted at Aransas Pass and Fulton. In January of 1880 a small establishment for canning fish was erected here by Messrs. Kearney & Mercer, but it was in operation only a short while. The fish marketed fresh were shipped on the steamers of the Morgan Steamship Line to Galveston and other ports, and thence distributed throughout the interior. This business was quite extensive for several years before those steamers abandoned this port.

On the completion of the San Antonio and Aransas Pass Railroad in 1888, a number of fishermen from Matagorda Bay moved here, and two fish-marketing houses were established. In 1890 these two were consolidated, but before the close of that year another market-house was erected, and the two are now doing business.

In 1890 there were engaged in the fishery industries of Aransas Bay 210 men, using property valued at \$59,540. The catch amounted to 2,055,150 pounds, for which the fishermen received \$62,822. The taking of fish by means of bay seines is the most important fishery here. The oyster industry ranks second, and considerable attention is given to the capture of green turtle. A few fish are taken by means of hook and line, and quantities of crabs, flounders, mullet, etc., are taken.

The bay-seine fishery.—In 1890 29 seines were used in taking fish for the Aransas Pass markets, and 90 men were employed in operating them. The catch amounted to 1,198,000 pounds of scale fish valued at \$41,925, and 46,100 pounds of green turtle and terrapins, for which the fishermen received \$1,637. The number of sail craft employed in the bay-seine fishery in that year was 27, the value of which was \$11,600. Of these only 5 were over 5 tons measurement.

The price received by the fishermen for their catch was 3½ cents per pound in 1890; it was 3½ and 4 cents in 1889, while in 1887 and 1888 it was only 3 cents per pound round weight.

During the last two or three years, on account of the abundance of fish and the good shipping facilities, the seine fishery has been more prosperous at Aransas Bay than at other points along the Texas coast. The average catch of fish to each man engaged in this fishery at Aransas Bay in 1890 was 13,823 pounds, valued at \$484.

The favorite fishing-grounds are north of Live Oak Peninsula, in Shallow Bay, along the shores of St. Joseph Island, in Redfish Bay, and St. Charles Bay. Seines are not used in the rivers nor outside in the Gulf of Mexico.

Hook-and-line and other fisheries.—In May and June numbers of persons engage in taking jewfish with hook and line, and about 25,000 pounds are captured annually. The catch is usually sold to the marketmen at 4 cents per pound. The quantity of redfish, trout, tarpon, etc., taken by means of hooks and lines by sportsmen and the professional fishermen who engage at odd times in this fishery is about 35,000 pounds annually. These would sell in the local markets for about \$1,200.

In most of the rivers in this section of the State there are many catfish, but no established fishery for taking them exists here as in Louisiana. These fish are especially abundant in the Guadalupe River, which empties into San Antonio Bay. They are very popular, in many places being preferred to trout (squeteague) and redfish. The market for them in the State was developed by the dealers at Morgan City, La.

A few cast nets are used here, and flounders and crabs are taken by means of spears and lines, respectively. These fisheries, however, are of minor importance.

The oyster industry.—Next to the seine fishery the taking of oysters is the most important fishery of Aransas Bay. Twenty-six men were employed in this fishery in 1890, and the catch amounted to 26,550 bushels, for which the fishermen received \$6,600. The reefs resorted to change from year to year, on account of the freshets occasionally destroying many of the beds. During some years the greater part of the oysters handled are obtained from reefs in Matagorda Bay. The best-known reefs in Aransas Bay and tributaries are located off the northeast section of St. Joseph Island and in the southern waters of Copano Bay. In the extreme eastern part of Aransas Bay there are several small and scattered reefs which are quite productive. The area

of the grounds in this bay and its tributaries that have produced oysters during the past ten years is estimated at 15 square miles.

The depth of water over the oyster beds varies from a few inches to 8 or more feet. No oysters are obtained from grounds more than 7 feet under water, although there are probably many beds in such places.

Only a small part of the oysters shipped from the shores of Aransas Bay are obtained from its waters. In recent years the supply has been largely drawn from Matagorda Bay, while Espiritu Santo, Mesquit, and Corpus Christi bays have furnished a few for this market.

The green-turtle fishery.—Green turtle (*Chelonia mydas*) have at times appeared in large numbers in Aransas Bay. In 1869 the beef-packeries began to can them. When these canneries were closed about ten years ago, a small factory was established at Fulton for preparing turtle meat for market in 1 and 2 pound tin cans. This is still continued.

The weight of the green turtle taken on the Texas coast varies from 10 to 1,000 pounds, and averages about 270 pounds. When they arrive in Texas waters they are in poor condition, but they fatten rapidly and are best for the market from August to the end of the season.

Aransas and Matagorda bays and the lower end of Laguna Madre are favorite fishing-grounds; yet at times the nets are set in other bays on the coast, and trips are made even beyond the Rio Grande. The season for "turtling" begins in March and closes in October, June to September being the best time for this fishery.

Green turtle are never taken with seines on this coast, nor are they usually hunted on the beaches during the breeding season. Gill nets are the common means of capture, the length varying from 60 to 100 feet, and the depth from 7 to 10 feet. The size of the mesh ranges from 14 to 16 inches square, the twine used being from 48 to 60 medium-laid. The nets are made by the fishermen, and about 2½ pounds of twine are necessary for each one. No lead line is used, only a float line being required. The cost of each net, ready for use, including ropes, cost of making, etc., is about \$15. Each fishing crew should have twenty or more of these nets.

The nets are set in the "runs" or channels to which the turtle resort to feed. The order in which they are set varies with the "lay of the land." One of the lower ends of the net is fastened by means of a rope to an anchor, leaving the net to swing freely with the current. Each one is generally placed at a distance from the other slightly greater than the length of the net, so that the nets may swing clear of each other when the current changes. A turtle swimming through the "run" is likely to pass a "flipper" through the mesh of one of these nets; and while endeavoring to extricate it, becomes completely entangled and is easily secured. The daily catch varies from nothing to 20 turtles, an average of 2 or 3 being quite good. The depth of water in which the nets are set is usually from 9 to 14 feet. The best fishing is done at night, but the day time is very good if moderate trade winds prevail and the water be slightly rough.

Green turtle are gradually becoming less abundant on the coast of Texas; yet on account of the increasing demand for them the annual catch is probably increasing. The turtles are either disposed of at the Fulton canning factory or are sold to the fresh-fish marketmen, who ship them to the interior and even to New York City. Those sent to the latter place go by the regular line of steamers from Galveston, to which port they are sent by rail or general freight boats from Aransas Pass. They are shipped alive, and live a great length of time out of water.

The fishermen usually receive from 1 to 2 cents per pound for their catch. While awaiting a suitable market the turtles are kept in "crawls," or pens, made of poles driven in the bottom of the bay a few inches from each other, and sufficiently long to project a few feet above the surface of the water. If properly fed, the turtle may be retained several months in such inclosures.

The cannery at Fulton was established on a small scale in 1881. In 1890 about 900 green turtles, weighing 243,000 pounds, were reported as being received at this cannery. About 40,000 2-pound cans of turtle meat, and 300 dozen 2-pound cans and 500 dozen 3-pound cans of "turtle soup" were prepared. It is quite difficult to prepare these products so that they will keep a suitable length of time, such work requiring close attention and the greatest cleanliness.

The shells of the green turtle have no recognized commercial value.

Marketing of fishery products.—In 1890 there were two wholesale fish and oyster markets at Aransas Pass. The number of men employed was 31, and the capital invested \$23,000. All the fishery and game products of the region were handled by these two houses, and in the same manner as is common along the coast. One of the marketing houses was connected with an ice plant and the fish were preserved in dry cold storage while awaiting orders from the interior.

CORPUS CHRISTI BAY.

Southwest of Aransas Bay and connected with it by Corpus Christi Bayou is situated Corpus Christi Bay. This is a beautiful body of water, very nearly circular in shape, and, together with its tributaries, covers about 185 square miles. The average depth of water is fully 14 feet. At present the only navigable outlet is through Aransas Pass by way of Corpus Christi Bayou. This bayou had a natural depth of water of about 4 feet, but by Morris and Cunningham's Cut it has been made navigable for vessels drawing 7 feet.

The only estuaries entering Corpus Christi Bay are the Nueces River and Oso Creek. The latter, as implied by its name, is quite salty. It is wide and shallow and drains but a small area; in fact, it is more of a tributary bay than a creek. The Nueces River drains about 10,000 square miles of territory, and at times during the spring it empties great quantities of fresh water into the bay.

The fisheries prosecuted.—In Corpus Christi Bay all the fish common to the bays along the Texas coast are found. In 1886, when Indianola was destroyed, many of the fishermen from that place came to Corpus Christi, and these, together with a large number of men who formerly fished at Point Isabel, are now plying their trade here. The total number of men engaged in the fishery industry of this bay in 1890 was reported to be 175, and the capital invested \$44,330. The catch amounted to 1,238,550 pounds, for which the fishermen received \$45,625. Only two of the fisheries prosecuted here have any commercial importance; these are the bay-seine fishery and the oyster industry. Many green turtle are handled in the wholesale markets of Corpus Christi, but they are purchased of the fishermen hailing from Aransas Bay and Point Isabel. Shrimp are found to a limited extent, but no fishery has been established for taking them. Crabs and a few flounders are taken by boys and wharf-idlers for local consumption.

The bay-seine fishery.—In 1890 there were engaged in the seine fishery at Corpus Christi 70 men, using 16 sailboats valued at \$5,200, and seines, skiffs, and live-fish cars to the value of \$2,820. The catch amounted to 719,950 pounds, for which the fishermen received \$24,965. This fishery is gradually increasing in extent at Corpus Christi. The sail craft employed are somewhat larger than those used in the other bays of Texas. The market men report that redfish are growing scarcer and that sheepshead are rather more plentiful than formerly. The price received by the fishermen for their catch has been for the past several years about 3½ cents per pound for the ordinary fish.

Hand-line and other fisheries.—Many redfish, trout, jewfish, etc., are taken by means of hand lines by the Corpus Christi fishermen and sportsmen, and occasionally a visit is made to the red-snapper banks off Aransas Pass. The hook-and-line fishery does not, however, have any commercial rank. The total quantity of fish taken in this manner is about 25,000 pounds annually. These would sell in the markets for about \$1,000.

A large number of cast nets are used by boys and others for fishing off the wharves and along the shores. The catch, which consists of mullet, trout, etc., amounts to about 20,000 pounds annually.

Spears are in use to a small extent in the shallow waters, for the purpose of obtaining flounders, the annual catch amounting to about 4,000 pounds.

Crab fishery.—As at other points along the Texas coast, crabs are abundant in Corpus Christi Bay. There is, however, little demand for them in the markets, and even this is entirely for local consumption; hence no one engages in taking them to so great an extent as to depend on it for a living. The crabs are taken by means of dip nets, baited lines, etc. The catch is mostly peddled about the city and sells at 15 to 30 cents per dozen.

The oyster industry.—The area of the natural oyster reefs in Corpus Christi Bay, at present known to the fishermen, is estimated at 13 square miles. The beds are located principally near the shore between the San Antonio and Aransas Pass Railroad bridge and Ingleside Cove. A few small reefs lie directly off the piers at Corpus Christi, and about halfway between Corpus Christi and the mouth of Oso Creek there are others. At the entrance of Oso Creek into the bay and around Shamrock Point a few oysters have been obtained. But the two last-mentioned reefs are somewhat distant from the city and the water is deep and frequently rough, so that they are rarely fished on.

On account of the great depth of water in Corpus Christi Bay, the condition of only such grounds as are located in the shoal waters near the shore are known to the fishermen. There seems to be no reason to doubt that many oyster reefs at present unknown exist in the deeper waters of this bay, as well as in the other bays along the coast.

Frequently spring freshets occur on the Nueces River, and the great quantities of fresh water emptied into the bay destroy many oysters. Occasionally these freshets bring down quantities of sand and mud, which cover the oyster beds and prove very destructive.

In 1890 the number of men engaged in oystering from Corpus Christi Bay was 40. They used 13 sailboats, valued at \$6,100, and skiffs and tongs to the value of \$390. The catch of oysters amounted to 65,400 bushels, for which the fishermen received \$18,350.

Prior to the season of 1890-91 no instruments other than tongs had been used for taking oysters in Corpus Christi Bay. During that season, however, a small dredge was used on the schooner *C. Highland*, 16.36 tons measurement. This was the first attempt to utilize dredges in the taking of oysters in this State. The work done was completely satisfactory, and doubtless many more dredges would have been employed during the following season had not the State legislature prohibited their further use.

Fish and oyster markets.—There were two wholesale dealers at Corpus Christi in 1890, who handled nearly all the fish and oysters taken by the Corpus Christi fishermen; also many oysters obtained from Matagorda and Aransas bays.

LAGUNA MADRE AND THE LOWER RIO GRANDE.

Opening directly into Corpus Christi Bay, and extending southward a distance of 120 miles to Boca Chica, lies Laguna Madre, so called because of the numerous smaller lagoons or shallow bays extending inland that are tributary to it. Laguna Madre is from 2 to 13 miles wide, and covers an area of about 811 square miles. It is very shallow, averaging but little over 2 feet in depth, and in many places the ground is quite bare at low tide. It is not navigable except in limited areas.

On account of the saltness of the water, few fish are found in Laguna Madre, except at the extreme lower end near Point Isabel, where the

less salty water of the Gulf of Mexico finds entrance through Brazos Santiago and Boca Chica. The depth of water here varies from 3 to 6 feet. All the species of fish common along the Texas coast are found here, and many of them in abundance. But the fisheries are not prosecuted to any great extent on account of the small market for the catch.

Bay-seine fishery.—The bay-seine fishery employs two seines, four men being required for each seine. These men work probably about one hundred and fifty days in the year. The catch, which amounts to about 75,000 pounds annually, is bunched and sent by rail to Brownsville and Matamoras once or twice each week, particular attention being paid to having them on the markets on "fast days." Each bunch of fish weighs about 5 pounds, and these are sold in the markets for "two bits" (25 cents) each. The weight of fish in a bunch varies according to the supply and demand, but the price per bunch does not ordinarily change.

The seine fishermen also catch shrimp in their seines, the quantity obtained annually being about 30,000 pounds. These are marketed both fresh and dried.

Catfish on the Lower Rio Grande.—In the Rio Grande, between its mouth and Hidalgo, a distance of about 100 miles, yellow and silver catfish are abundant. The quantity taken on the American side is about 30,000 pounds annually. Aside from this no fishery is reported from the Lower Rio Grande.

Cast-net and crab fisheries.—About twenty cast nets are used at Point Isabel at times. The catch consists of mullet, shrimp, trout, etc., but chiefly of the first named variety. It amounts to about 10,000 pounds annually, some of which is consumed locally and the rest sent to Brownsville.

A few crabs are taken here by traps and lines. The catch, however, is quite small on account of the limited market demand.

Green-turtle fishery.—About 50,000 pounds of green turtle are obtained annually, one sailboat and three men being employed; but on account of the distance from market the prices received by the fishermen are small, averaging not over a cent per pound. A large factory for canning green turtle, oysters, fish, game, etc., was for a short while in operation at Point Isabel.

The oyster industry.—Four men, with three small sailboats, are reported as having engaged in taking oysters by means of tongs in 1890.

The oyster reefs near Point Isabel are quite scattering, and are spread over about 3 square miles. The most productive grounds are located along the shore of the mainland, about 3 or 4 miles west of Point Isabel. Some small reefs are included between Long Island and the mainland, and at various other points. The total quantity of oysters taken annually from this section is about 4,200 bushels. Many more might be obtained, but the catch is restricted by the small demand.

STATISTICS.

Table of persons employed in the fisheries of Texas in 1890.

| How engaged. | Sabino Lake. | Galveston Bay. | Matagorda Bay. | Aransas Bay. | Corpus Christi Bay. | Laguna Madre and lower Rio Grande. | Total. |
|---------------------------------|--------------|----------------|----------------|--------------|---------------------|------------------------------------|--------------|
| Bay-seine fishery | 8 | 165 | 17 | 90 | 70 | 8 | 358 |
| Oyster industry | | 215 | 84 | 26 | 40 | 4 | 369 |
| Surf-seine fishery | | 24 | | | | | 24 |
| Shrimp-seine fishery | | 20 | | | | | 20 |
| Turtle fishery | | | | *19 | | | *22 |
| Miscellaneous fisheries † | 26 | 163 | 30 | 50 | 40 | 19 | 328 |
| Marketing and canning | | 196 | 8 | 41 | 25 | 2 | 172 |
| Total | 34 | 683 | 139 | 210 | 175 | 36 | 1,277 |

* Sixteen of these men engaged also in the oyster fishery during the winter, hence they are included only once in the totals.

† Of 328 men employed in "miscellaneous fisheries" only the following number depended on the fisheries for a living: Sabino Lake, 6; Galveston Bay, 16; and Corpus Christi Bay, 10.

‡ This includes 11 men on the steamer *Cumberland*, engaged in transporting fish and oysters.

Table of apparatus and capital in the fisheries of Texas in 1890.

| Designation. | Sabino Lake. | | Galveston Bay. | | Matagorda Bay. | | Aransas Bay. | |
|-------------------------------------|--------------|------------|----------------|----------------|----------------|---------------|--------------|---------------|
| | No. | Value. | No. | Value. | No. | Value. | No. | Value. |
| Sail craft, bay-seine fishery | 2 | \$350 | 58 | \$10,690 | 5 | \$1,650 | 27 | \$11,600 |
| oyster fishery | | | 127 | 42,900 | 35 | 12,400 | 11 | 4,400 |
| other fisheries | | | 16 | 800 | | | 1 | 700 |
| Skiffs, bay-seine fishery | 2 | 20 | 176 | 1,950 | 6 | 60 | 32 | 330 |
| oyster fishery | | | 210 | 2,140 | 45 | 380 | 17 | 170 |
| other fisheries | 6 | 30 | | | | | 2 | 30 |
| Apparatus of capture, etc.: | | | | | | | | |
| Bay seines | 2 | 200 | 60 | 7,550 | 5 | 500 | 20 | 4,350 |
| Surf seines | | | 12 | 900 | | | | |
| Shrimp seines | | | 10 | 750 | | | | |
| Cast nets | 30 | 95 | 95 | 355 | 30 | 100 | 50 | 180 |
| Turtle nets | | | | | | | 200 | 2,000 |
| Crab traps | | | 75 | 25 | | | | |
| Lines, spears, etc | | 70 | | 1,050 | | 10 | | 55 |
| Oyster tongs | | | 240 | 1,600 | 84 | 546 | 29 | 175 |
| Live-fish cars | 10 | 61 | 120 | 1,200 | 5 | 50 | 55 | 550 |
| Transporting steamer | | | 1 | 15,000 | | | | |
| Shore property | | | | 64,500 | | 1,000 | | 25,000 |
| Cash capital | | | | 30,000 | | 1,500 | | 10,000 |
| Total | | 826 | | 190,410 | | 18,190 | | 59,540 |

| Designation. | Corpus Christi Bay. | | Laguna Madre and lower Rio Grande. | | Total for the State. | |
|-------------------------------------|---------------------|---------------|------------------------------------|--------------|----------------------|-----------------|
| | No. | Value. | No. | Value. | No. | Value. |
| Sail craft, bay-seine fishery | 16 | \$5,200 | 2 | \$200 | 110 | \$38,750 |
| oyster fishery | 13 | 6,100 | 2 | 450 | 189 | 66,250 |
| other fisheries | | | 1 | 300 | 12 | 1,800 |
| Skiffs, bay-seine fishery | 16 | 240 | 2 | 18 | 234 | 2,618 |
| oyster fishery | 13 | 130 | 3 | 25 | 288 | 2,845 |
| other fisheries | | | 6 | 92 | 14 | 152 |
| Apparatus of capture, etc.: | | | | | | |
| Bay seines | 16 | 2,400 | 2 | 200 | 114 | 15,200 |
| Surf seines | | | | | 12 | 900 |
| Shrimp seines | | | | | 10 | 750 |
| Cast nets | 90 | 280 | 20 | 60 | 315 | 1,070 |
| Turtle nets | | | 6 | 72 | 206 | 2,072 |
| Crab traps | | | 12 | 3 | 87 | 28 |
| Lines, spears, etc | | 40 | | 100 | | 1,325 |
| Oyster tongs | 40 | 260 | 4 | 25 | 397 | 2,606 |
| Live-fish cars | 18 | 180 | 4 | 20 | 212 | 2,061 |
| Transporting steamer | | | | | 1 | 15,000 |
| Shore property | | 17,500 | | 500 | | 108,500 |
| Cash capital | | 12,000 | | | | 53,500 |
| Total | | 44,330 | | 2,125 | | *315,427 |

* In addition to this amount \$3,605, not elsewhere enumerated, representing the value of the provisions, etc., carried by the vessels of Galveston, Aransas, and Corpus Christi bays, is to be added to give the total investment.

Table showing by apparatus and species the products of the fisheries of Texas in 1890.

H. Mis. 113—27

THE COAST FISHERIES OF TEXAS.

| Apparatus and species. | Sabine Lake. | | Galveston Bay. | | Matagorda Bay. | | Aransas Bay. | | Corpus Christi Bay. | | Laguna Madre and lower Rio Grande. | | Total. | |
|--------------------------|---------------|--------------|------------------|---------------|----------------|--------------|------------------|---------------|---------------------|---------------|------------------------------------|--------------|------------------|----------------|
| | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. |
| Bay seines: | | | | | | | | | | | | | | |
| Bluefish | | | 6,000 | \$300 | 500 | \$20 | 8,000 | \$262 | 3,000 | \$105 | | | 17,500 | \$687 |
| Buffalo | 13,800 | \$690 | | | | | | | | | | | 13,800 | 690 |
| Catfish | 5,500 | 275 | | | | | | | | | | | 5,500 | 275 |
| Croakers | 2,000 | 100 | 64,000 | 3,172 | 4,750 | 166 | 53,000 | 1,560 | 42,000 | 1,215 | 2,200 | \$77 | 167,950 | 6,290 |
| Flounders | | | 20,700 | 1,060 | 5,950 | 238 | 22,000 | 757 | 12,000 | 480 | 3,000 | 90 | 63,650 | 2,625 |
| Hogfish or capitaine | | | 17,000 | 850 | 1,100 | 44 | | | 7,000 | 280 | 750 | 30 | 25,850 | 1,204 |
| Jackfish or crevalle | | | 23,650 | 1,140 | 1,500 | 45 | 20,000 | 700 | 10,000 | 320 | 1,200 | 36 | 56,350 | 2,241 |
| Jewfish | | | 4,000 | 200 | | | 3,500 | 114 | 2,000 | 60 | | | 9,500 | 374 |
| Mullet | | | 16,950 | 625 | 1,000 | 25 | 6,000 | 120 | 3,000 | 45 | | | 26,950 | 815 |
| Perch or bream | 1,000 | 50 | 18,500 | 900 | 1,200 | 36 | 6,000 | 210 | 4,000 | 120 | 1,000 | 30 | 31,700 | 1,346 |
| Pike | 800 | 40 | 20,400 | 1,000 | 1,000 | 35 | 5,000 | 170 | 4,500 | 135 | 750 | 22 | 32,450 | 1,402 |
| Pompano | | | 2,000 | 60 | | | | | | | | | 2,000 | 60 |
| Redfish or channel bass | 6,500 | 370 | 418,000 | 21,755 | 28,500 | 982 | 320,000 | 14,775 | 210,800 | 8,083 | 9,000 | 365 | 1,070,800 | 46,330 |
| Rockfish or striped bass | | | 5,000 | 250 | | | 3,000 | 103 | 1,000 | 38 | | | 9,000 | 391 |
| Sand trout | 500 | 30 | 46,850 | 2,300 | 2,950 | 103 | 45,000 | 1,545 | 31,250 | 850 | 2,600 | 90 | 120,150 | 5,018 |
| Sea trout | 7,000 | 350 | 387,350 | 20,803 | 30,850 | 1,079 | 327,500 | 11,461 | 185,700 | 6,598 | 10,000 | 360 | 948,400 | 40,671 |
| Sheepshead | 5,000 | 250 | 306,000 | 14,829 | 18,450 | 645 | 268,000 | 8,827 | 154,200 | 5,236 | 6,500 | 260 | 759,050 | 30,947 |
| Shoemaker | | | 7,800 | 380 | | | 3,000 | 88 | 1,500 | 45 | | | 12,300 | 513 |
| Spanish mackerel | | | 10,000 | 600 | 1,000 | 55 | 9,000 | 358 | 5,000 | 300 | | | 25,000 | 1,319 |
| Torrapin | 2,700 | 650 | 2,400 | 600 | | | 1,100 | 282 | | | | | 6,200 | 1,532 |
| Turtle | | | 2,000 | 80 | | | 45,000 | 1,355 | | | | | 47,000 | 1,485 |
| Miscellaneous fish | 2,200 | 88 | 30,000 | 1,555 | 4,000 | 120 | 30,000 | 875 | 34,000 | 955 | 39,800 | 1,200 | 149,000 | 4,793 |
| Total | 47,000 | 2,883 | 1,418,500 | 72,969 | 192,756 | 3,593 | 1,244,100 | 43,562 | 719,950 | 24,965 | 76,800 | 2,580 | 3,060,100 | 150,582 |
| Surf seines: | | | | | | | | | | | | | | |
| Croakers | | | 8,000 | 440 | | | | | | | | | 8,000 | 440 |
| Redfish or channel bass | | | 6,000 | 300 | | | | | | | | | 6,000 | 300 |
| Sand trout | | | 10,000 | 650 | | | | | | | | | 10,000 | 650 |
| Miscellaneous fish | | | 15,000 | 920 | | | | | | | | | 15,000 | 920 |
| Total | | | 39,000 | 2,400 | | | | | | | | | 39,000 | 2,400 |
| Shrimp seines: | | | | | | | | | | | | | | |
| Shrimp | | | 138,000 | 4,510 | | | | | | | | | 138,000 | 4,510 |

* Of this amount, 34,800 pounds were shrimp, valued at \$1,050.

Table showing by apparatus and species the products of the fisheries of Texas in 1890—Continued.

| Apparatus and species. | Sabine Lake. | | Galveston Bay. | | Matagorda Bay. | | Aransas Bay. | | Corpus Christi Bay. | | Laguna Madre and lower Rio Grande. | | Total. | |
|------------------------------|---------------|--------------|------------------|----------------|----------------|---------------|------------------|---------------|---------------------|---------------|------------------------------------|--------------|------------------|----------------|
| | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. |
| Lines: | | | | | | | | | | | | | | |
| Catfish..... | 7,000 | \$340 | 7,500 | \$225 | | | | | | | 25,000 | \$1,250 | 39,500 | \$1,813 |
| Jewfish..... | | | 2,500 | 100 | | | 30,000 | \$1,200 | 5,000 | \$200 | | | 37,500 | 1,500 |
| Redfish or channel bass..... | 2,500 | 125 | 4,000 | 200 | | | 24,000 | 800 | 8,000 | 320 | | | 38,500 | 1,445 |
| Red snapper..... | | | 4,800 | 240 | | | | | | | | | 4,800 | 240 |
| Sea trout..... | 3,200 | 160 | 3,000 | 210 | | | | | | | | | 6,200 | 370 |
| Sheepshead..... | 2,000 | 80 | 7,400 | 345 | | | | | | | | | 9,400 | 425 |
| Miscellaneous fish..... | 7,000 | 250 | 8,000 | 520 | 10,000 | \$400 | 16,000 | 600 | 12,000 | 480 | 13,500 | 550 | 66,500 | 2,800 |
| Total..... | 21,700 | 955 | 37,200 | 1,840 | 10,000 | 400 | 70,000 | 2,600 | 25,000 | 1,000 | 38,500 | 1,800 | 202,400 | 8,395 |
| Cast nets: | | | | | | | | | | | | | | |
| Mullet..... | | | 15,000 | 600 | | | | | 10,000 | 300 | 4,000 | 120 | 29,000 | 1,020 |
| Perch or bream..... | | | 3,000 | 180 | | | | | | | | | 3,000 | 180 |
| Shrimp..... | | | | | 1,000 | 30 | | | 4,000 | 160 | 2,000 | 80 | 7,000 | 270 |
| Sea trout..... | | | | | | | | | | | 1,500 | 60 | 1,500 | 60 |
| Miscellaneous fish..... | 3,000 | 190 | 10,000 | 400 | 14,000 | 470 | 16,000 | 600 | 6,000 | 200 | 2,000 | 60 | 51,000 | 2,010 |
| Total..... | 3,000 | 190 | 28,000 | 1,180 | 15,000 | 500 | 16,000 | 600 | 20,000 | 750 | 9,500 | 320 | 91,500 | 3,340 |
| Spears: | | | | | | | | | | | | | | |
| Flounders..... | | | 27,000 | 1,600 | | | 36,000 | 1,440 | 4,000 | 160 | | | 67,000 | 3,200 |
| Crab traps, etc: | | | | | | | | | | | | | | |
| Crabs..... | | | 162,500 | 4,200 | | | 13,200 | 440 | 11,800 | 400 | 3,200 | 55 | 190,800 | 5,095 |
| Turtle nets: | | | | | | | | | | | | | | |
| Green turtle..... | | | | | | | 400,000 | 7,580 | | | 48,000 | 410 | 538,000 | 7,990 |
| Oyster tongs: | | | | | | | | | | | | | | |
| Oysters..... | | | 1,647,100 | 72,140 | 763,450 | 29,200 | 185,850 | 6,600 | 457,800 | 18,350 | 29,400 | 1,700 | 3,085,600 | 127,090 |
| Grand total..... | 71,700 | 4,038 | 3,497,300 | 160,860 | 893,200 | 33,690 | 2,055,150 | 62,822 | 1,238,550 | 45,625 | 205,500 | 6,865 | 7,961,400 | 313,912 |

THE OYSTER LAW OF TEXAS.

The oyster law at present operative in this State, and to which reference has been made in the foregoing text, is as follows:

An act for the preservation of oysters and oyster beds, and for protecting the rights of persons to the same, and affixing penalties, and providing locations for planting oysters. (Laws of 1891, chapter 98.)

Be it enacted by the legislature of the State of Texas, That oyster beds shall be public and private; all those not designated as private, shall be public; all natural oyster beds and oyster reefs shall be deemed public. No person shall take or catch oysters from any public beds for market or sale or planting from the first day of May to the first day of September in any year. Any person offending against the provisions of this section shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined for each offense not less than ten nor more than fifty dollars.

2. When oysters are culled or selected from public beds, those not wanted for market or sale or for family use, shall be planted while alive, by the person or persons taking them, on the beds from which they were taken, or some other bed, public or private, and any person violating the provisions of this section shall be guilty of a misdemeanor, and upon conviction thereof shall be fined for each offense not less than ten dollars nor more than fifty dollars.

3. Where any creek, bayou, lake, or cove, not made a navigable stream by the laws of this State or of the United States, runs through the lands of any person, such person or other lawful occupant shall have the exclusive right to use said creek, bayou, lake, or cove for gathering, planting, or sowing oysters within the metes and bounds of the original grant or patent of said land; but if said creek, bayou, lake, or cove is not included in the survey of said lands, then the exclusive rights of the riparian owner shall extend to the middle of said creek, bayou, lake, or cove.

4. Any person who is an actual bona fide citizen of the State of Texas shall have the right of obtaining a location for planting oysters and making private oyster beds within any public navigable waters of this State, other than those mentioned in section 3 of this act, by designating a square space not exceeding five hundred and thirty-eight yards square, intended by him for such purpose, by not less than four buoys anchored, or four stakes firmly and permanently planted, one at each corner of such location, and by establishing posted notices of the same on one or more of said corner stakes or buoys; said stakes shall project at least four feet above ordinary tides and shall be not less than six inches in diameter if of wood or three inches in diameter if of iron, and any person so locating as aforesaid shall be protected in his possession thereof against trespass thereon, in like manner as free holders are protected in their rights for a term of fifteen years after filing with the county clerk his notice of location: *Provided*, That no person shall have the right to locate any of the public oyster beds or oyster reefs within the public navigable waters of this State under this act or under any pre-existing law. All oyster locations made under this act shall expire at the end of fifteen years from the date of filing the notice of location with the county clerk, and said location shall then revert to the State, as if the same had never been located: *And provided further*, That no person shall locate any private oyster bed in the public navigable waters of this State within one hundred yards of low-water mark of any shore without the consent of the riparian owner, said owner only having that right, nor shall anyone be permitted in any wise to interfere with navigation by inclosure of said oyster beds.

5. At any time not exceeding sixty days after placing in position any one or more of said corner posts or buoys upon one of which shall be placed the notice hereinbefore required, the locator shall file, with the county clerk of the county in which his location lies, a notice of his location. The same shall be a notice to whom it concerns that the locator has on a certain date, naming it, located a private oyster bed on a

certain space, describing it by such metes and bounds as will suffice to locate it on the ground or water, and that he has placed posts or buoys as required by law. If such notice be filed before the four corners are designated by posts or buoys, the notice shall so state and be followed in sixty days by a supplementary notice after the four corners are all designated by posts or buoys. Notices of location shall in all cases state that the location described does not conflict with any other private bed, and that it is not on any public bed or oyster reef. The notices filed with the clerk as aforesaid shall further state that the locator is a bona fide citizen of the State of Texas. It shall be signed and sworn to by the locator or his agent; the county clerk shall record such notices in a well-bound book to be kept for that purpose, and the original with a certificate of registration returned to the locator. The county clerk shall receive for his services in recording such notices the same fee as is charged for recording deeds. The original or certified copies from the records shall be admissible in evidence under the same rules governing the admission of deeds or certified copies thereof. When the location lies in more than one county the notice shall be filed in all the counties in which the location is situated, or otherwise the location will be effective only as to those portions lying in the county or counties in which the notice or notices are filed. Upon complying with the provisions of this act, the right of the locator shall date from the placing of the first post or buoy. All oyster beds planted, created, or established in accordance with sections 3 and 4 of this act shall be private oyster beds, and the owners of the same shall be entitled to all the privileges and protection of this act, after having caused his claim to be duly posted and recorded in the county clerk's office as herein provided.

6. That it shall not be lawful for any person to plant or purchase oysters for planting, bedding, or depositing, or for marketing or for any other purpose whatever, from the 1st day of May to the 1st day of September in any year, and if any person shall violate the provisions of this section, or either of them, he shall be deemed guilty of a misdemeanor, and on conviction he shall be fined for each offense not less than ten nor more than one hundred dollars.

7. If any person shall willfully take oysters from a private bed or shall take oysters deposited by one making up a cargo for market or for family use without the consent or permission of the owner thereof, he shall be deemed guilty of theft, and upon conviction shall be fined in any sum not less than fifty nor more than two hundred dollars, and by confinement in the county jail for a term of not less than twenty days nor more than twelve months.

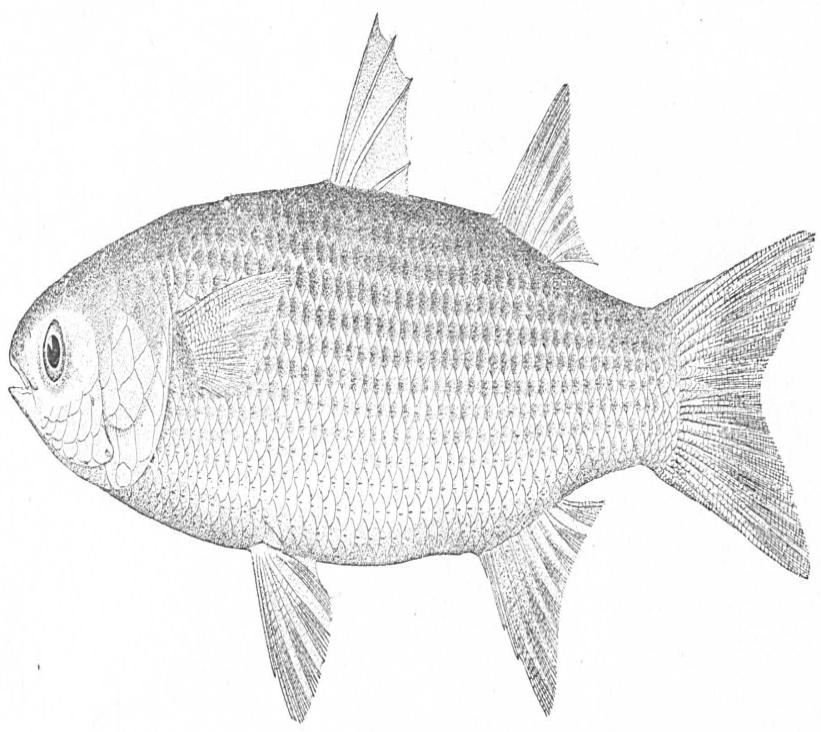
8. It shall be unlawful for any person or persons to rake, dredge, or excavate with machinery any public oyster bed or oyster reefs in the waters of this State. Any person or persons who shall violate the provisions of this section shall on conviction be fined in any sum not less than five hundred nor more than one thousand dollars. Each day's violation of any of the provisions of this section will constitute a separate offense.

9. Any person who shall willfully deface, injure, or destroy or remove any post or buoy, or any part thereof used to designate the corners or boundaries of any private oyster beds without the consent of the owner of said private oyster bed, shall be deemed guilty of malicious mischief and punished accordingly.

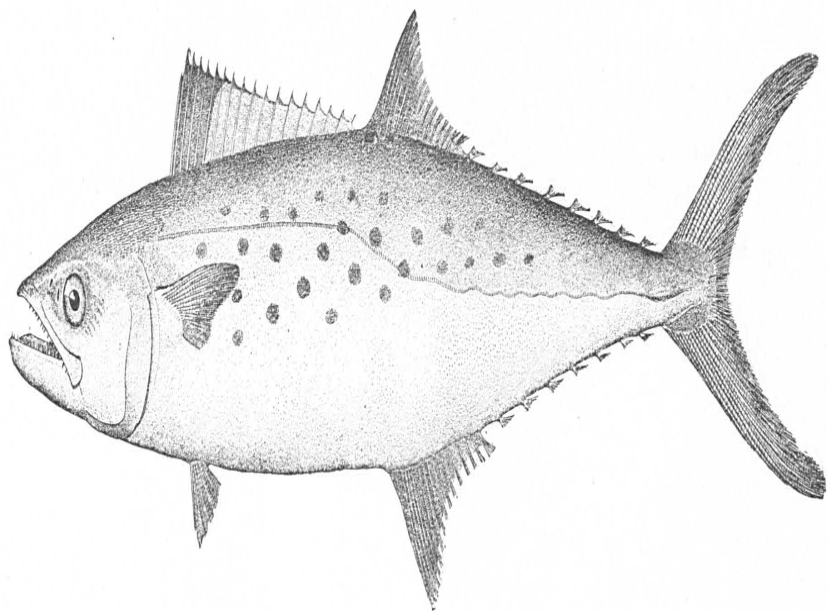
10. No person, firm, or corporation shall ever own, lease, or otherwise control more than six hundred and forty acres of land covered with water, the same being oyster locations in this State, and any corporation that now holds six hundred and forty acres or more of such oyster locations shall not be permitted hereafter to acquire, own, lease, or otherwise control more, provided that no corporation shall own or lease, or otherwise control any such land covered by water unless such corporation shall be duly incorporated under the laws of this State.

11. All laws and parts of laws in conflict with the provisions of this act are hereby repealed.

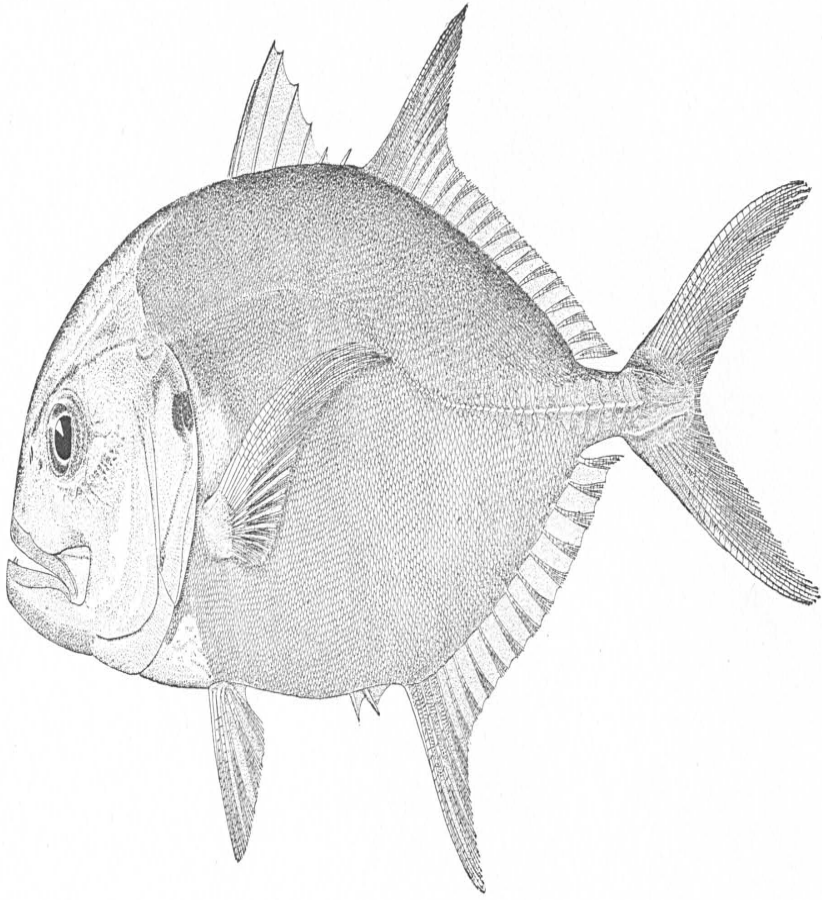
12. [Emergency clause.]



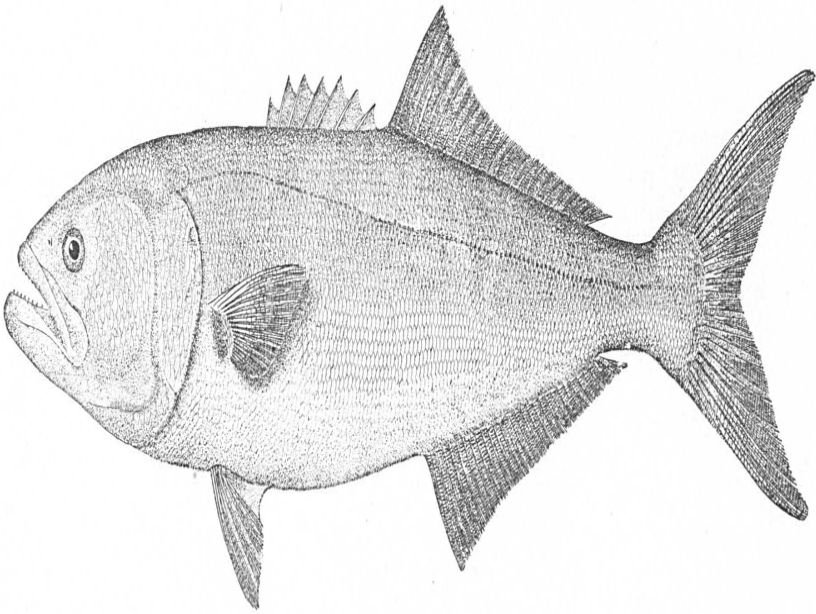
MUGIL CEPHALUS Linnæus. *Striped mullet.*



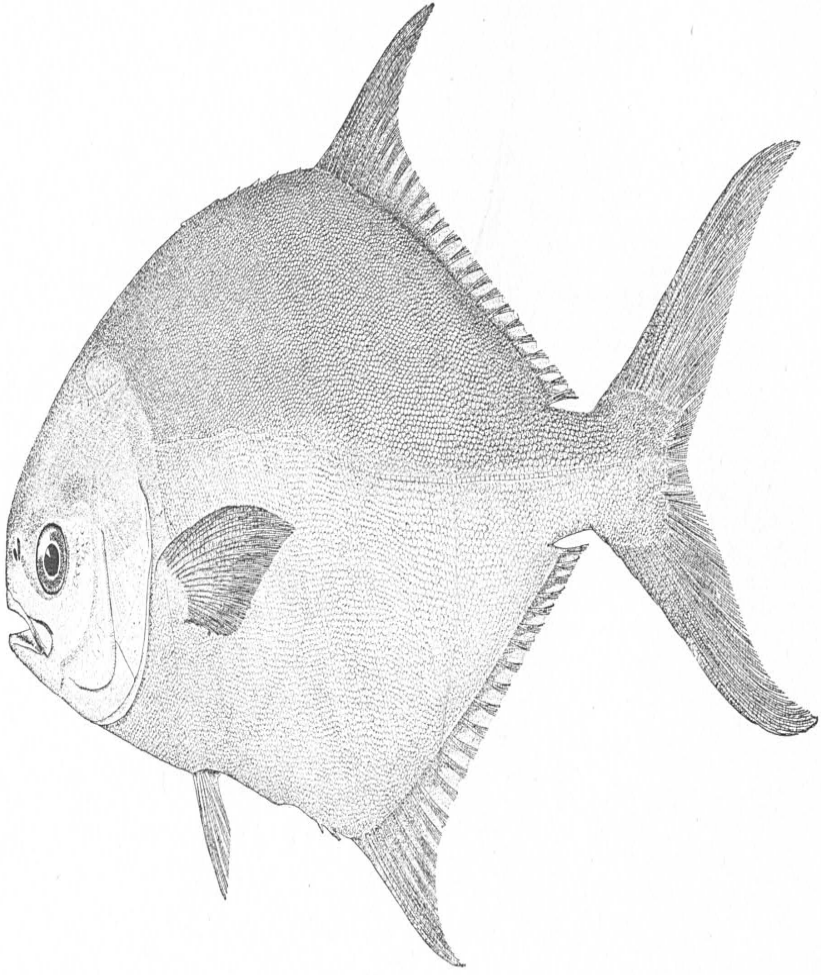
SCOMBEROMORUS MACULATUS (Mitchill). *Spanish mackerel.*



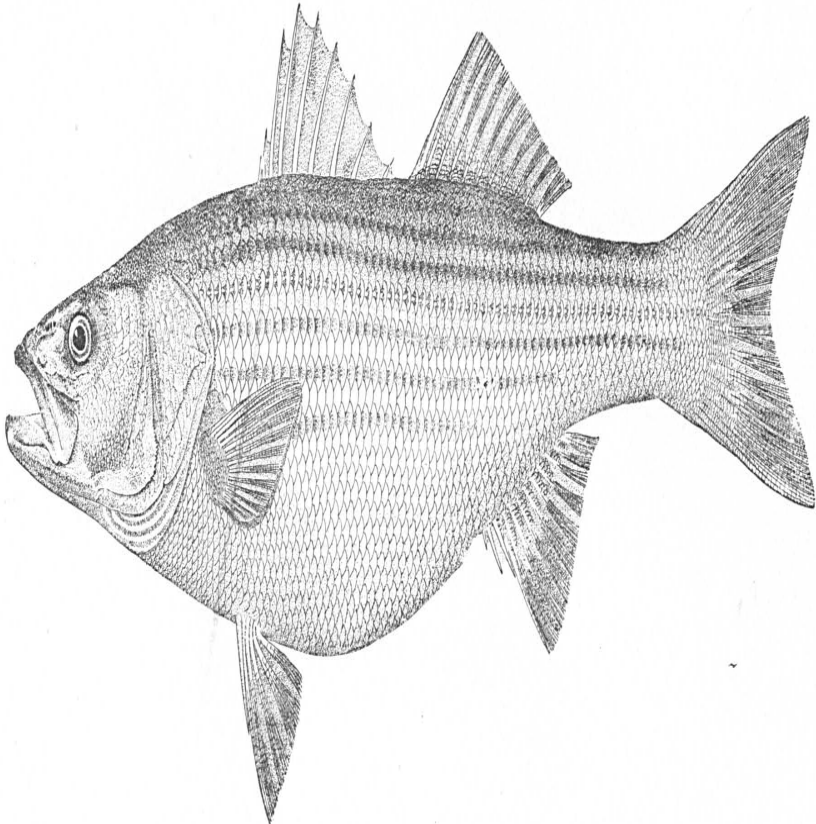
CARANX HIPPOS (Linnæus). *Crevallé; Jackfish.*



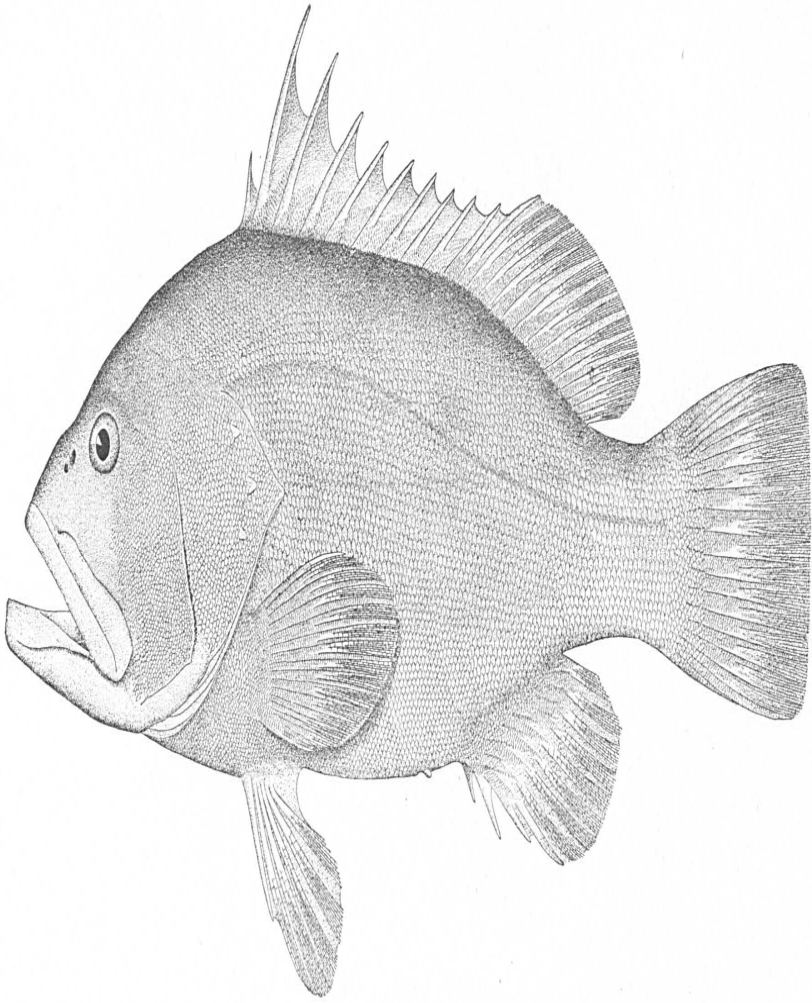
POMATOMUS SALTATRIX (Linnaeus). *Bluefish.*



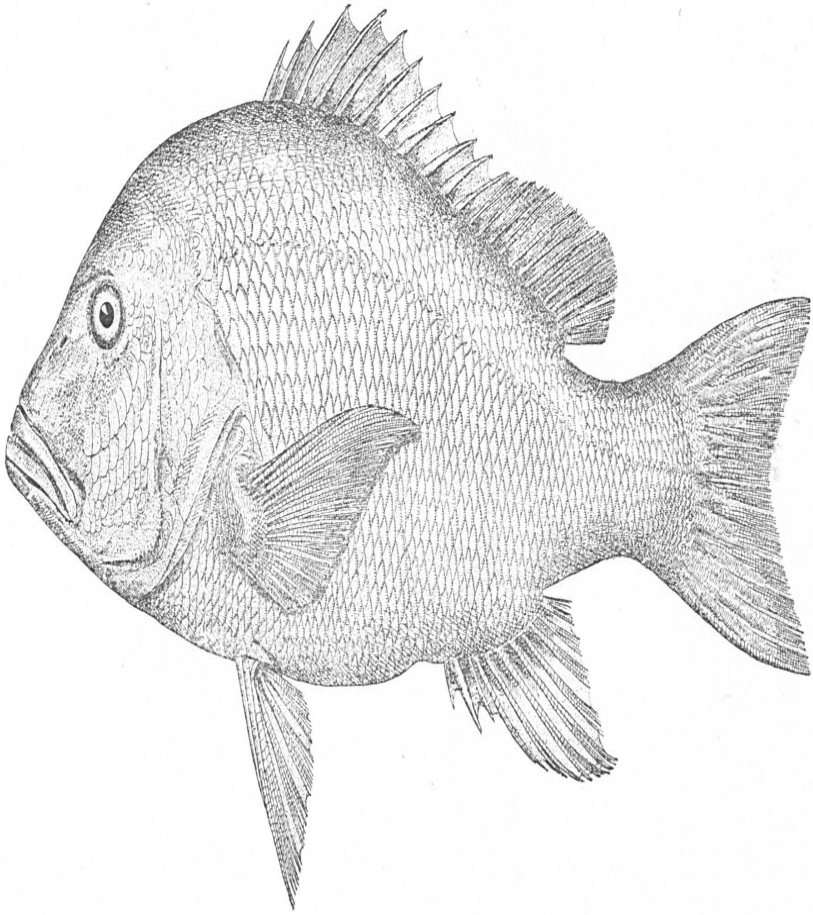
TRACHYNOTUS CAROLINUS (Linnæus). *Pompano.*



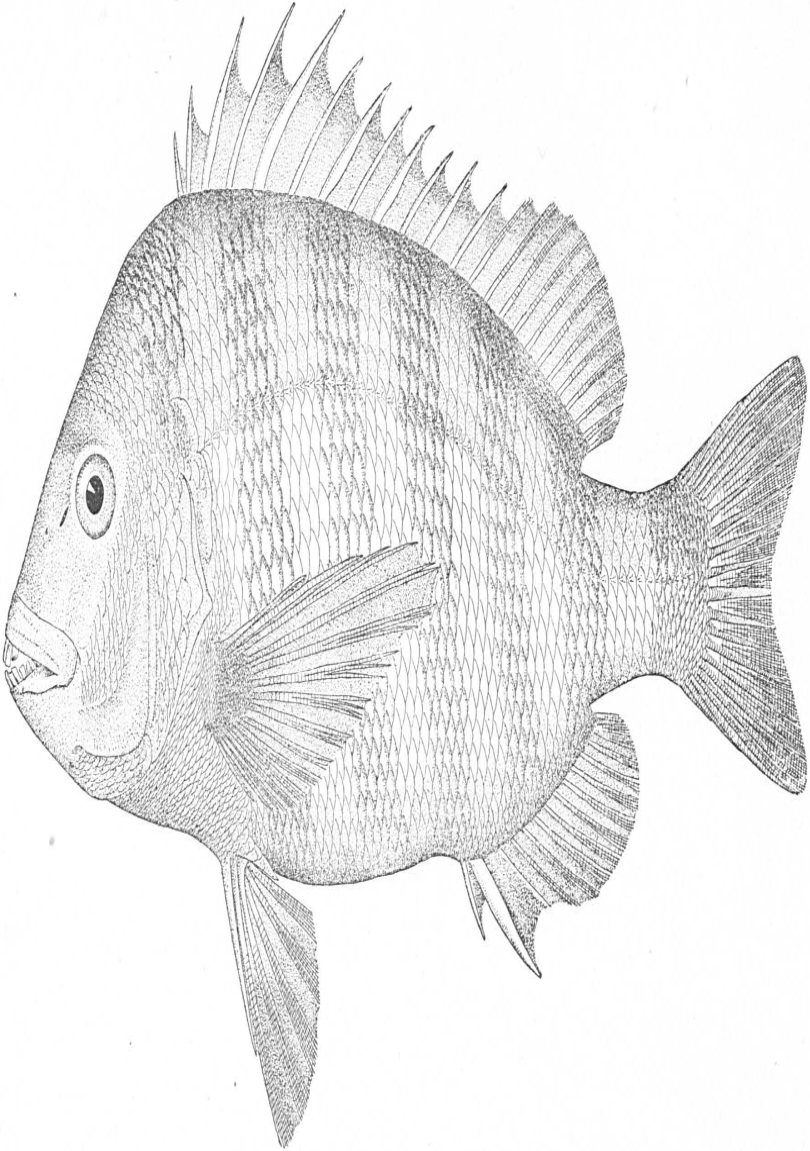
ROCCUS LINEATUS (Bloch), *Striped bass; Rockfish.*



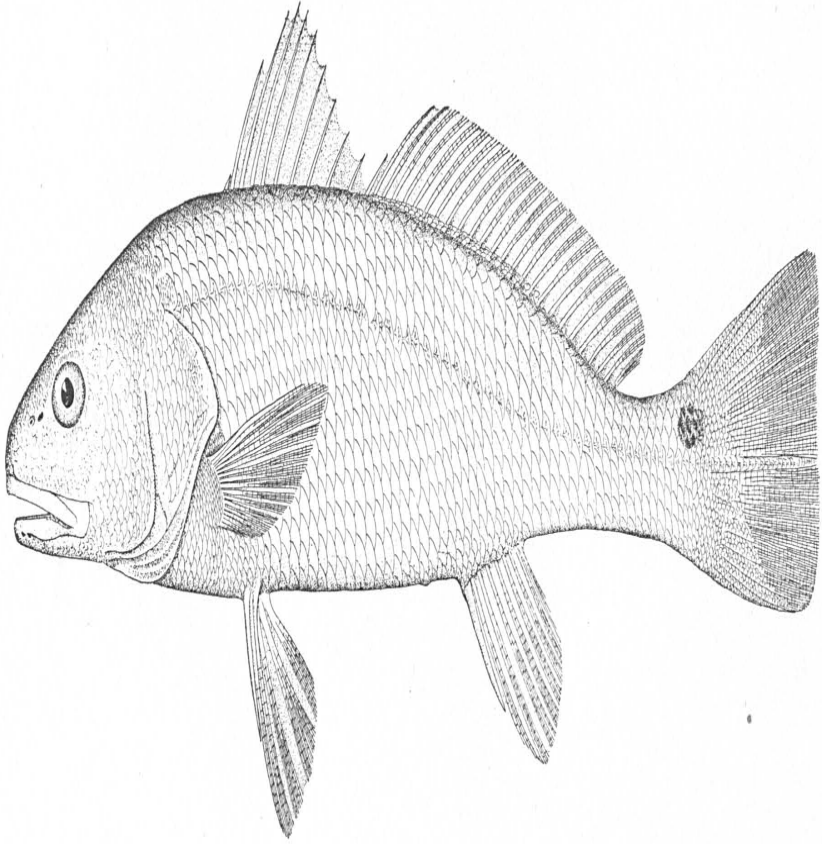
EPINEPHELUS NIGRITUS (Holbrook). *Sea-fish.*



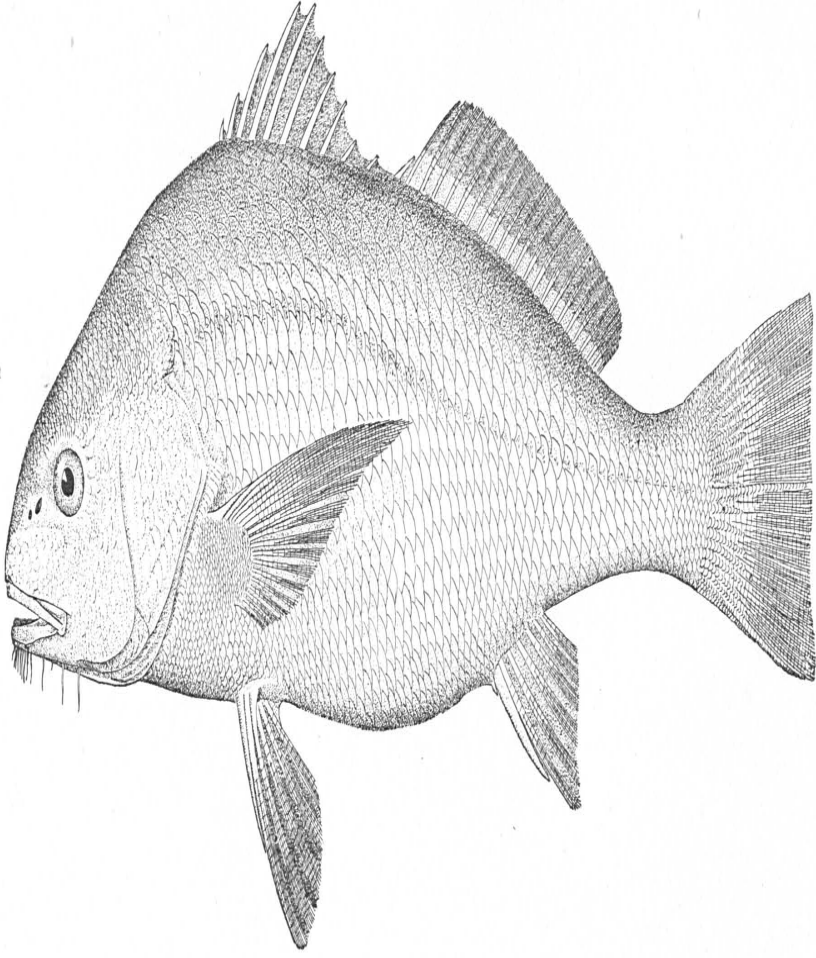
LUTJANUS AYA (Bloch). *Red snapper.*



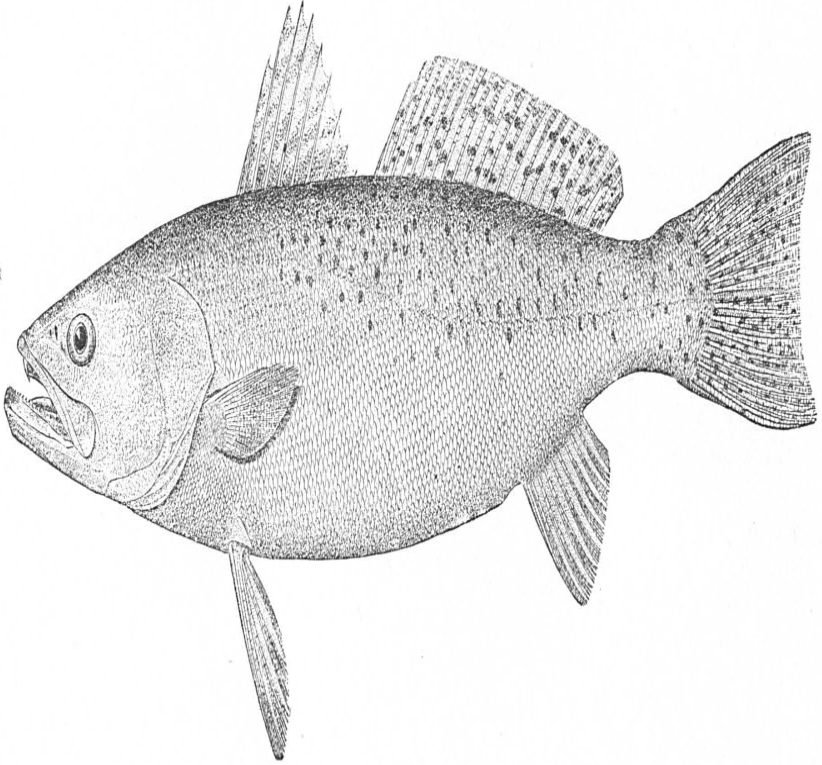
ARCHOSARGUS PROBATOCEPHALUS (Walbaum). *Sheepshead.*



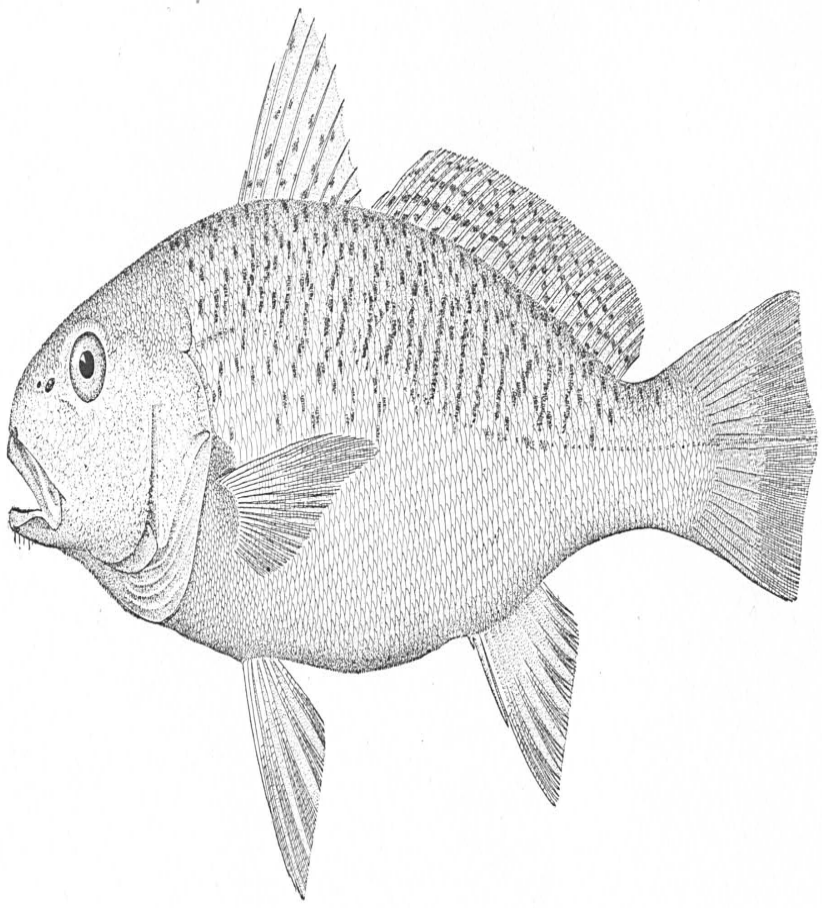
SCIÆNA OCELLATA (Linnæus). *Redfish; Channel bass.*



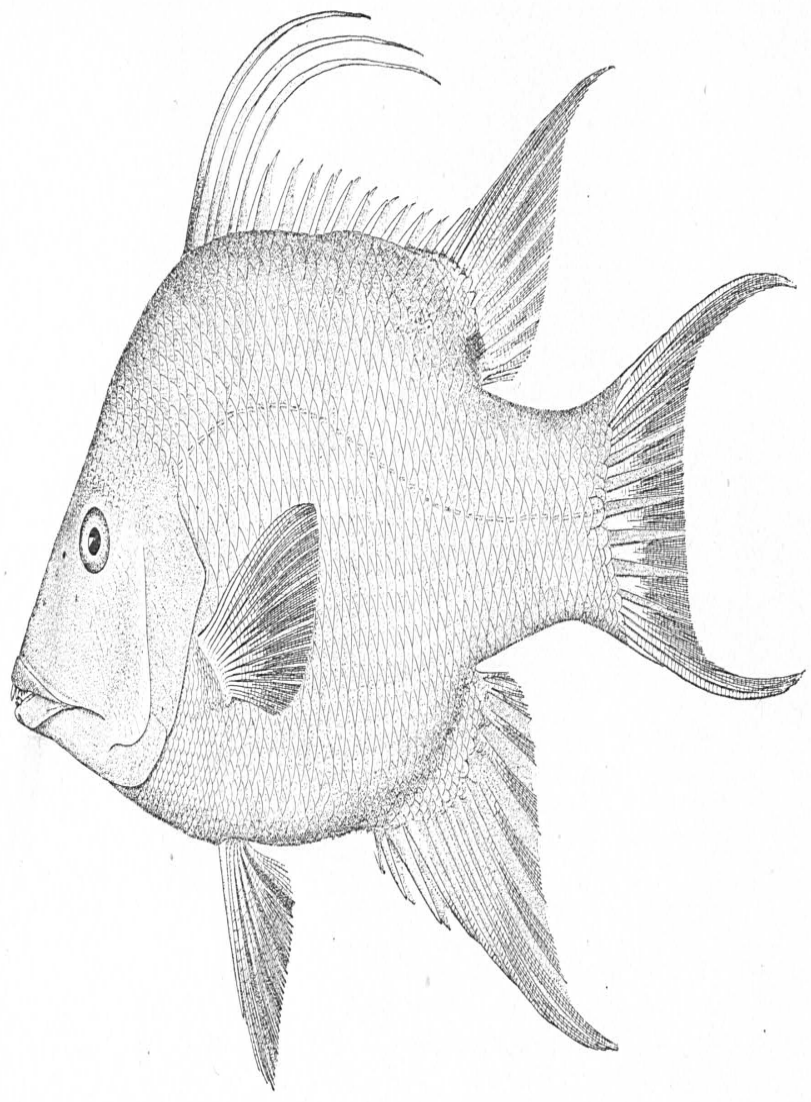
POGONIAS CROMIS (Linnæus). *Drum.*



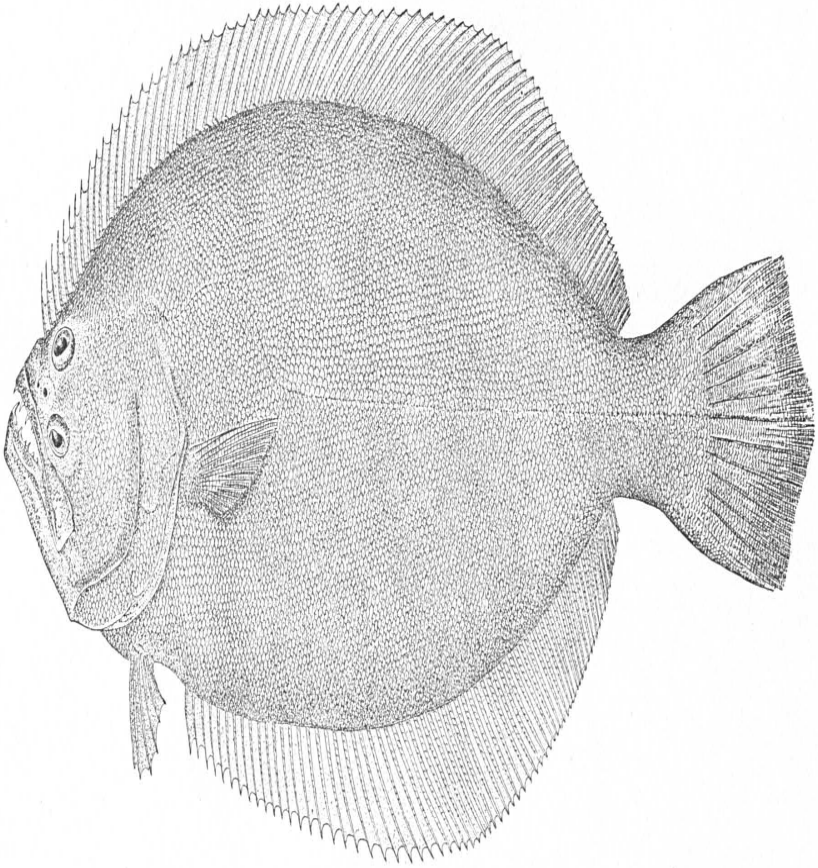
CYNOSCION NEBULOSUS (Cuvier and Valenciennes) *Trout; Sea trout.*



MICROPOGON UNDULATUS (Linnæus). Cronker.



LACHNOLAIMUS FALCATUS (Linnæus). Hogfish; Capitaine.



PARALICHTHYS LETHOSTIGMA Jordan and Gilbert. *Flounder.*