THE FISHERIES.

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THE total product of the fisheries of the United States, including the whale fishery in 1860, according to the official returns, was upwards of thirteen millions of dollars, ($13,664,805)—an increase of more than thirty per cent. over their value in 1850. Considerably more than one-half of this amount, or $7,749,305, was the proceeds of whale fishing, and $4,183,503, or nearly one-third of the whole, represented the value of cod, mackerel, and herring, &c., taken in that year. The value of the white fish taken in the northern lakes was $464,479; more than half of which was returned from Michigan. The shad fishery yielded a product of $321,052—North Carolina being the largest producer. Of oysters, the value taken was $756,350, and $51,500 was the value of salmon caught, principally in the rivers of the Pacific coast.

These returns by no means represent the actual value of this ancient and profitable industry of our maritime States. It is well known that great numbers of the population bordering on our seaboard and lake fronts are accustomed to divide their time between fishing, farming, and other employments, on land or water. Being employed for a few weeks only in a certain branch of the fishery, and the remainder of the year as farmers, mechanics, or sailors, the product of their fishing ventures is often overlooked. Other causes contribute to render the statistics of this industry necessarily more or less partial and defective.

The statistics of the deep-sea and river fisheries, exclusive of the whale trade, embrace the products of 1,524 establishments, and amounted to $5,915,500. Of these, 1,053 belonged to the eastern and middle States, and employed an aggregate capital of $3,898,606 and 13,699 hands, the product of which was $4,756,766. The western lake States returned 248 fishing establishments, with a capital of $294,219, which employed 1,274 hands, and yielded a return of $583,241. Virginia, North Carolina, Florida, Alabama, and Texas numbered 206 establishments, with a capital of $252,002, and an aggregate product of $400,556. California, Oregon, and Washington Territory reported seventeen concerns, having collectively a capital of $70,420 and 244 hands engaged in taking fish to the value of $174,937. Of the aggregate returns, $6,734,955, the product of the whaling business, and $2,637,604, the value of other branches, making together $9,163,842, or 70 per cent. of the total value, was the result of the maritime industry of Massachusetts alone. The latter sum was the product of 169 fishing establishments, whose capital amounted to $2,520,200, the raw material consumed amounted to $452,778, and the hands employed to 7,642, (twenty of them females,) whose labor was valued at $1,220,439.

This favorite pursuit of the enterprising people of Massachusetts has made Boston, which has been more than two and a quarter centuries engaged in it, the principal fish-distributing market of the Union. It has also raised the port of Gloucester, which has been still longer in the business, to the third rank among New England seaports in the amount of its foreign commerce, and placed it in advance of all other towns in the Union, if not in the world, in the amount of tonnage employed in the domestic fisheries. This town owns nearly one-third of all the tonnage of the State employed in that industry, and distributes the products to all the large cities of the United States and to foreign countries.

Maine holds the second rank in respect to the value of its fisheries. The State returned nearly double the number of fishing establishments of any other, 350, whose capital was $687,001; these employed 3,595 hands, and returned a product of $1,008,689, against $569,876 in 1850.

Connecticut numbered 145 fishing establishments, employing a capital of $254,685 and 690 hands, the product of whose labor was $288,589.

New York had 82 concerns engaged in fishing, 43 of them for oysters, whose aggregate capital was $74,000 and their product $151,040, much the larger part of which was the value of oysters taken. The returns from this State were much below those of 1850, when the proceeds of the fisheries was $353,775.

New Jersey returned 160 establishments in the oyster trade and 32 in other branches, whose aggregate capital was $209,795 and their product $433,225, chiefly in oysters.

Virginia employed 130 fishing establishments in the oyster and 28 in the shad fishery, whose collective investments were $133,490 and their annual products $207,442—about two-thirds of the latter being the value of oysters taken.

North Carolina had 32 concerns employed in fishing, chiefly for shad and herring, to the value of $117,259.

The fisheries of Florida amounted to $68,952, and included 6,625 quintals of codfish, the balance being chiefly shad and herring.

California employed nine establishments in the salmon, white fish, and oyster fisheries, the value of which was $95,940.

Washington Territory returned a total value of fish taken equal to $65,547, two-thirds of which amount was by a single oyster-house, which employed 100 men and a capital of $18,000, the balance being the value of 1,800 barrels of salmon taken.

In the whale fishery there was a slight falling off from the value returned in 1850. This branch nevertheless employed in four States 422 establishments and a total capital of $13,292,060. The cost of raw material employed in it was $2,789,195, and the number of hands 12,301, whose wages amounted to $3,509,080. The aggregate value of the proceeds of this fishery was $7,749,305. Further remarks upon this branch of industry will be found under a separate heading.

Almost from the first discovery of this continent the attention of Europeans was attracted by the abundance of fish swarming on the Atlantic coast of America. The Bank and shore fishery of Newfoundland was commenced immediately after the discovery of the island by Cabot, in 1497, chiefly by French, Spanish, and Portuguese from Normandy and the bay of Biscay. In 1517, when the first English ship visited the Grand Banks to fish, those countries had fifty sail engaged in the business. In 1615 England, having abandoned in part the coasts of Iceland, had 250 ships of 15,000 tons, and the French and Biscayans 400 ships at Newfoundland. By the peace of Utrecht, in 1713, the French were restricted in their fishing privileges in America, and the fishery fell more into the hands of England and her American colonies. On the final surrender of Cape Breton, in 1759, the French were nearly excluded from the American coast fisheries, Great Britain and her colonies dividing the business until the Revolution dissolved the partnership, leaving, however, to the United States, by treaty, the right of fishing on the British-American coasts.

Thus early commenced, and gradually extended to the St. Lawrence and more western coasts, the fisheries continued to be fostered by France and England as a profitable industry, and especially as a training school for seamen. Both nations, more particularly the former, encouraged them by bounties and other legislative measures of the most liberal character.

The first adventurers to our own shores were led by the glowing and often exaggerated accounts of the wealth and maritime consequence which accrued to the Dutch, and other European nations, early in the 17th century, from their whale, cod, and herring fisheries in the northern seas, to count much upon the fisheries as a source of profit. In this they were aided also by the vague notions then prevalent of the unexampled richness of all natural resources in America. In these expectations they were not altogether disappointed. The first English statute relating to America is said to have been enacted for the protection of British fishermen on this coast from the exactions of the admiralty.

The shore fishery of New England may be said to have commenced in 1602, when Bartholomew Gosnold explored the coast and fished for cod near the cape, which he named from that circumstance. In 1614 Captain John Smith, in his first voyage to New England, failing in the main purpose of his expedition, of which whaling was a part, retrieved his ill fortunes by a successful fishing venture on the coast of Maine in boats built there for the purpose. He made, during a part of one season, about 40,000 dry fish, and 7,000 "car-fish," as the largest cod were called, "poor John" being the name applied by him to the smaller dry codfish, such as Newfoundland produced. The best of these fish were sold in Europe for £5 the hundred, each hundred making two quintals, or more than double as much as the Newfoundland fish. In 1616 eight English ships made full fares on our coast.

In 1620 Monhegan island, which Smith had visited, on the coast of Maine, had become a noted fishing station. In 1623 about 35 or 40 sail, and the next year 50 vessels, left England to engage in fishing along our shores, the exclusive right to which, between the 40th and 48th degrees of north latitude, was claimed by the Plymouth company, which, in the latter year, established a fishing station on the south side of Cape Ann, where the flourishing town of Gloucester now stands. The town was incorporated in 1639, in which year the general court of Massachusetts, for the encouragement of the fisheries, exempted from duties and taxes all persons engaged in catching, curing, and transporting fish. The building of fishing vessels on shares was commenced at Plymouth in 1627, and in 1629 preparations on a larger scale were made for carrying on the same business by the Bay Colony. Fish were exported from Boston to the Dutch, at Manhattan, in 1628, and in American-built vessels to foreign countries in 1633. The profits of the mackerel, bass, and herring fishery at Cape Cod were granted, about the year 1670, to found a free school which was opened the next year.

From that time to the present the fisheries have, with few interruptions, been prosecuted with vigor in American bottoms in all the bays and streams of New England and on distant shores, forming a valuable resource to the colonies in the poverty and feebleness of their infancy, and an element of wealth and power in the manhood of their independence. Occasional essays have been made in other sections of the Atlantic States, but as a national industry, fishing enterprise has been mainly confined to New England. As auxiliaries to the fishery, ship-building, salt-making, and other collateral industries were there early undertaken, and grew and flourished with it.

At Plymouth, Boston, Salem, Marblehead, Scituate, Newburyport, New Bedford, Salisbury, in Massachusetts; at Kittery, Pemaquid, and other places in the Casco and Penobscot bays; at New London, Connecticut, and at Newport and Providence, Rhode Island, great numbers of boats, shallops, pinnaces, pinks, sloops, and other small craft for the shore fisheries, and larger vessels for the whale fishery, were built yearly, and sent forth by the inhabitants on fishing ventures.

At Pemaquid Point, Sir William Phipps, a native of the place, was engaged in both industries as early as 1675, and about the same time the family of Sir William Pepperell, another native of the province, became extensively engaged in ship-building, fishing, and other maritime pursuits at Kittery Point and the Isles of Shoals, the latter place noted for producing a delicate variety of cod, known as "dun fish." In 1731 about one thousand sail of vessels and five to six thousand men were employed by the four New England colonies in fishing, in addition to about 1,300 tons of shipping engaged in the whale fishery. Ten years later Massachusetts owned four hundred fishing vessels, besides shallops and undecked boats, and the product of the fishery was 230,000 quintals, of which $700,000 worth were exported.

From 1765 to 1775 that colony employed in fishing 665 vessels, measuring 25,650 tons, and 4,405 seamen employed in the cod fishery. They caught annually from 350,000 to 400,000 quintals of fish. Of these vessels, 150 belonged to Marblehead, and 140 to Gloucester, and their aggregate tonnage was 13,030 tons. At the outbreak of the Revolution many of these were employed in privateering.

By the treaty of peace, in 1783, in consequence of the firmness of the American commissioners, Great Britain guaranteed to the United States the right of fishing on the Banks of Newfoundland, in the Gulf of St. Lawrence, and on the British Ameri-

can coasts south of that, with the liberty of curing and drying fish on the uninhabited bays, harbors, and creeks of Nova Scotia, Labrador, and the Magdalen islands, so long as they remained unsettled, and after that by agreement with the possessors of the soil. The fisheries slowly recovered their former prosperity, in which they were aided by Congress, which in 1789 granted a drawback on salt imported for their use. In lieu of the drawback, a bounty of five cents was the same year granted on each quintal and barrel of fish exported to foreign countries, and a duty of fifty cents a quintal was, at the same time, laid on foreign caught and dried fish imported into the United States. In consequence of memorials from the fishermen of Marblehead, and from the legislature of Massachusetts, Congress, in 1792, once more substituted a bounty on fishing vessels of one dollar to $2 50 per ton, according to size, and the same year increased it twenty per cent. In 1797 an additional thirty-three and a half per cent. was made to the bounty on fishing vessels, and another of twelve cents per barrel was allowed on pickled fish exported. In 1804, the duty on foreign fish imported was continued without drawback, and in April, 1816, it was raised to one dollar per quintal on the same conditions as before. The bounties, modified from time to time, were repealed in 1807, re-enacted in 1813, and increased in March, 1819. During the first twelve years of the operations of this last act, the bounties paid amounted to $209,000. Congress, in 1826, refused to reduce the duty to fifteen cents as petitioned by the merchants of Baltimore. Thus encouraged by bounties and duties, the fisheries continued to prosper, until the embargo of 1809, and the war which ensued, suspended them almost entirely.

The treaty of 1783 having been regarded by Great Britain as a concession of the shore fisheries, that government, in negotiating a new peace, refused to regrant the privilege without an equivalent. It was not until 1818 that the difference was settled by a commercial convention, in which it was agreed that fishermen of the United States should enjoy substantially the same privileges as before, except that on certain parts of the British American coasts they were not allowed to cure fish within three marine miles of the shore. Difficulties which arose between British, colonial, and American fishermen in regard to the interpretation of this compact, were finally settled by the reciprocity treaty, approved August 5, 1854, by which Americans enjoy greater privileges in fishing than before, and substantially the same as British subjects.

By the warehousing act of 1846, foreign fish were allowed to be imported and entered in bond, and thence exported, without payment of duty, but under the reciprocity act colonial fish are admitted free of duty. These acts have caused our principal fish-distributing cities, as Boston, New York, and Philadelphia, to become exporters of large quantities of foreign fish. At the termination of the last war with Great Britain, in 1815, the fishing tonnage of the United States was not over 15,000 tons, much of it having been diverted into the naval service of the Union. In 1835 it amounted to 114,000, and in 1845 it reached 289,000 tons. In 1855, Massachusetts alone employed, including the whale fishery, but exclusive of Nantucket, 231,967 tons in the business. The total allowances paid to vessels engaged in the fisheries, under the acts before mentioned, between January 1, 1820, and June 30, 1851, amounted to $7,725,373, and the bounties paid during the same time, on pickled fish exported, was $241,936.

The total value of the products of the sea fisheries of the United States exported during the year ending June 30, 1858, was $3,550,295, of which sum $2,865,847 was derived from the whale fishery, and $684,448 from the mackerel, cod, and herring fisheries. For the year ending June 30, 1864, the exports were ————

In the prosecution of the fisheries, certain towns of New England are usually engaged almost exclusively in a certain branch of the business, as those of Barnstable county, in the cod and herring; New Bedford, and the town of Nantucket, in whaling.

THE COD FISHERY.

Few, if any, families of fishes supply a greater number of species, valuable for food, than that of the *gadus*, or cod. The most valuable genera of this family are the *Gadus morrhua*, or true cod; the *G. merlangus*, or pollock, also called whiting; the *G. merluccius*, or hake, and the *G. lota*, or ling; all of which belong to the cod fishery. Of the true cod, or *morrhua*, there are also varieties differing in size and quality. The largest and finest of these *(Morrhua Americana)* is caught principally off the coast of the United States, and particularly at the Isles of Shoals, on the coast of Maine and New Hampshire, and the smallest *(Morrhua vulgaris)* at Labrador, the latter variety being the common cod, which employs the vessels of all nations during the fishing season on the North Atlantic coasts. The *Morrhua æglifinus*, or haddock, is smaller and less delicate, but is taken in large quantities off our shores. We are informed by Mr. A. R. Hallowell, of Bangor, Maine, that a regular gradation is observed in the size of the fish taken at the different fishing grounds from St. George's Banks to the Grand Bank of Newfoundland, their size diminishing as they go east. This difference in the size of the cod taken near our shores and at Newfoundland was observed by the early voyagers to America, and is so well understood by expert fish-packers that they can generally tell by the size of the fish the region in which it was taken. Another peculiarity which distinguishes the fish of the two regions was also observed in very early times, and although well known to fishermen, has escaped the notice of writers on the subject, namely, that the American codfish of our western waters are more dry and solid in flesh than those of the eastern coasts. The former were known in European markets in former times as *dun fish*—a term since applied to codfish cured in a certain way. Mr. Hallowell states that 170 pounds of fresh codfish from St. George's Banks, when dried, will weigh a quintal, while it takes 250 pounds of fresh Labrador fish to make a quintal when dried. The average size of cod from St. George's Banks is twenty to the quintal. According to Dr. Storer* the *M. Americana* has been known to weigh 107 pounds. The maximum size of the *M. vulgaris* is 60 to 70 pounds, and one of 50 pounds is considered very large. The cod is an ocean fish, and is never found in the Mediterranean. It is confined also to the northern seas, where it deposits its spawn during

* Journal of Science, vol. 36, 377.

the early months of the year, making its appearance on the "Banks" about the end of May. Notwithstanding the many millions of cod annually taken by the fishermen of all nations during several hundred years past in all its principal resorts, its numbers do not appear to have been materially diminished. It is extremely prolific, as many as 9,384,000 eggs having been counted by an eminent naturalist in a codfish of moderate size.

The Newfoundland cod fishery—divided into the "Bank fishery," carried on in large vessels on the open sea, and the "shore fishery," carried on in boats and small craft near the shores of the island—commences at the end of May or early in June, and lasts about two months. At that time the vessels anchor upon those vast submarine elevations which extend for hundreds of miles around the coasts, and are the resort of countless numbers of fish that feed upon the small fry, worms, and crustacea with which the sandy bottom is covered. The vessels send out boats, each manned by two to four men or boys, who usually take the fish with hook and line. Every fisherman is provided with two lines, each armed with two hooks, baited with herring, mackerel, caplins, or other bait, one of which he throws out on either side of him. When fish are plentiful, both hooks are usually swallowed before they reach the bottom, at the depth of 25 to 100 feet, and the fisherman hauls in each alternately as fast as he can pull. A skilful fisherman will thus take often 400 codfish in a day. Many fish are also taken with the "jigger," which is a piece of lead shaped like a small fish, with a hook at each end, turned in opposite directions. This is jerked up and down by the line, and thus hooks the cod, which, however, more commonly swallows the tempting lure, and is drawn into the boat. Great numbers of codfish are also caught in seines four or five hundred feet in length. The fish as soon as taken are salted in bulk in the hold of the vessel, which, as soon as her cargo is made, proceeds to the shore, where the heading, splitting, and salting is done. Some are dry-salted, others cured in vats, with pickle. After salting, they are spread on lofty "flakes" or stagings, the fleshy side upward, to dry. When nearly cured they are stacked in piles to "sweat," and again spread out to dry, after which they are removed to the warm-houses. Great care is required in the curing, as the least error in the processes, or a slight shower on the drying fish, damages its quality. When too much salt is used, the fish are said to be "salt-burnt," and when too long exposed to the sun, they are "sun-burnt." Previous to exportation they are again spread out to dry and sorted. When simply salted, fish are known in commerce as *green cod;* when dried without salting, as *stock fish;* and when salted and dried in the sun, as *dry cod.* The "roes" of cod are used as bait for herrings, pilchards, &c., and the tongues are cut out and salted or pickled in kegs, with the sounds or swimming bladders, generally by old men, women, and children. The livers are put in vats or barrels and exposed to the sun and converted into oil.

Two methods of fitting out vessels for the cod fishery are practiced by New Englanders. Sometimes several farmers or their sons unite and build a schooner during the winter, which they man themselves, and having taken in the necessary stores they make a fishing voyage to the Gulf of St. Lawrence or Labrador, and return in time to put in the spring crops. They pay for the outfit and divide the net proceeds, and after harvest commence the fall fishing. The catch being salted down, and not dried, is termed mud fish, and kept for home consumption. The other plan is for a merchant or other owner of a vessel to let her to ten or fifteen men on shares. He finds the vessel and nets, and the men pay for the provisions, hooks, and lines, and for the salt wherewith to salt their share of the fish. One of the number acts as master, but has to fish as well as the others, and receives a small compensation as navigator—the crew receiving five-eighths of the fish caught and the owners three-eighths.

The cod fishery, which has been an established industry of Massachusetts for more than two hundred years, employed annually, from 1765 to 1775, from twenty-one ports in that province, including Maine, an average of 665 vessels, a tonnage of 25,630 tons and 4,405 seamen. The annual exportation to Europe in that time was 178,800 quintals, which sold for $3 05 per quintal, and to the West Indies the quantity exported was 172,500 quintals, worth $2 06 per quintal. After the Revolution fishing was again resumed, and from 1786 to 1790 the number of vessels annually employed in this fishery was 539, the tonnage 19,185, the number of seamen 3,292, and the exports to Europe were 108,600 quintals, at $3 each, and to the West Indies 141,550, at $2 per quintal. Marblehead and Gloucester were the principal fishing ports. A memorial of the Marblehead fishermen to Congress, in 1790, stated that the average annual earnings of each schooner from that time had fallen from $483 in 1787 to $456 in 1788, and to $283 in 1790. The average annual expenses, including insurance, was $416, showing a loss in the latter year of $143. A report of Mr. Jefferson, Secretary of the Treasury, on this and similar petitions, advised a withdrawal from the fisheries of all support from the treasury. Congress, however, granted a bounty on the exportation of salted fish by way of drawback of the duty on imported salt, and an allowance in money was afterwards made to vessels employed for a certain number of months in this fishery. Thus encouraged and stimulated by the revival of trade and commerce under the newly organized government, the New England fisheries again entered upon a season of prosperity. In 1807 four vessels were fitted out at Newburyport for the Labrador cod fishery, and were the first vessels from the United States that made their fares in the Esquimaux bay. From 1790 until the embargo and the last war with Great Britain, the export trade in fish steadily increased and reached its greatest prosperity. The heaviest exportations were in 1804, when they amounted to 567,828 quintals of dried fish, worth $2,400,000, and 89,482 barrels and 13,045 kegs of pickled fish, worth $640,000. The product of the cod fishery has never since been as great, and in 1814 fell to 31,310 quintals of dry fish, valued at $128,000, and 8,436 barrels of pickled fish, worth $50,000. The lowest average price obtained for dried and smoked fish from 1806 to 1823 was $3 25 in 1809, and the highest price $4 80 in 1815, toward the end of the war.

The principal markets for American codfish were the French, Spanish, Danish, Swedish, and Dutch West Indies, the Brazils, and the Catholic states of Europe. Hayti and the Spanish and Danish West Indies were the largest foreign consumers of pickled fish, but the greater part of the pickled fish of the United States is consumed at home.* An active trade, which

* McGregor's Statistics of America.

commenced in 1791, is carried on from Gloucester, Massachusetts, with Surinam or Dutch Guiana, and in 1856 employed 14 ships, barks, and brigs. About the year 1845, a prosperous trade was commenced between that town and the British-American provinces, from which, in 1856, upward of 200 vessels arrived annually. Gloucester, in that year, had employed in the fisheries a fleet of 304 vessels, averaging 70 tons each, or 21,000 tons of shipping. The capital invested was $1,089,250, and the men employed in it 3,040. The town exported 72,000 barrels of mackerel, worth $500,000, and 98,000 quintals of codfish, worth $300,000, 650 barrels of oil, and 210 tons of smoked halibut, and consumed 250,000 bushels of salt. This was exclusive of the boat and shore fishery of the place. Boston, as the leading fish emporium, had, at the same date, about thirty houses engaged in the fish trade, whose aggregate capital was $1,100,000, and their sales for that year were nearly $6,000,000.* Massachusetts, in 1853, employed 51,425 tons of shipping in the cod fishery.

An important branch of the domestic fishery, carried on in the bays, harbors, and rivers of New England—the value of which is usually omitted in the published statistics of this industry—is the trade in fresh fish for the daily markets of the seaport and inland cities of the Union. This trade is of two kinds: one of these consists in supplying the several maritime towns with fresh fish of various kinds, brought in boats from the local fisheries in the neighboring waters; the other is for the supply of more distant markets. Boston is the principal seat of the latter business, which was commenced there upwards of twenty years ago. In 1844, several firms in that city were engaged in furnishing New York, Philadelphia, Albany, Troy, and other cities, between the first of December and the first of May, in each year, with large quantities of fresh codfish haddock, and halibut, to the amount of 1,734,000 pounds. Of this amount one of the oldest and largest firms alone sent off 934,000 pounds of halibut, and 386,000 pounds of cod and haddock. The trade employed at that time about 60 vessels, of 3,000 tons, and 400 men, one half engaged in the halibut, and the other in the cod and haddock fishery. They were chiefly owned at Cape Ann and Cape Cod, and varied from six to fourteen days in the length of their voyages. The fish are brought to the wharves alive, by a peculiar construction of the vessels, which admits the water into a part of the hold, and when landed they are packed in ice and shipped to their destination. This business is conducted independently of that which supplies the city market. The latter trade, in 1836, employed in Boston 15 or 20 small schooners and a large number of boats in catching fresh codfish for market. A single vessel of 25 tons with six men, during five months, took 194,125 pounds of fresh cod, worth $3,026, exclusive of the oil made from the livers, which sold for $15 per barrel. The price varied from five to twelve shillings per hundred. Large quantities of haddock were, in the same way, brought to market and sold for a few cents each. Lynn, in the same season, was supplied with 4,680,000 pounds of fresh fish. Duxbury had ten market boats and forty men employed, which took thirty-eight to forty thousand fresh fish. Provincetown had the same number of boats in the business. Rockport, in Essex county, in 1855, sold 1,050,000 pounds of fresh fish, worth $15,750. The sales of fresh codfish and halibut in Boston in 1856 was estimated at $300,000. The fish were shipped in a frozen state to all the neighboring States.

THE HERRING FISHERY.

The *Clupeidæ* is a family of fishes, scarcely second to any in commercial importance, and abundance of the several kinds which it supplies for the use of mankind. Among these are included the several species of herring, the alewife, gaspereau, anchovy, sardine, sprat and shad. The anchovy and sprat are European fishes. The common herring *(Clupea harengus)* inhabits almost exclusively the seas north of the fortieth parallel, its winter rendezvous being probably within the Arctic circle. Herrings are perhaps the most abundant of the finny tribe. They furnish food for all the larger fishes, as they in turn prey upon all below them; yet such is their amazing productiveness, that it has been calculated that the offspring of a single herring, if permitted to multiply without accident for five years, would make a pile larger than the globe! The captain of a herring vessel states that at the Magdalen islands he has often seen the herring spawn two or three feet deep along the beach, to which it is driven by the wind. In April or May herring first appear off the Shetland islands, and by the end of June, or in July, they arrive in a vast army, covering the surface of the ocean for leagues in extent, and often to the depth of several hundred feet. Dividing at that point, they push forward in two dense columns, several miles in length and breadth, to the eastern and western shores of Great Britain, whence they subdivide to all the coasts of Europe, and probably to the northern coasts of America. Striking across the Atlantic also, in a southwestern direction, they arrive on the coast of Georgia, the southern limit of their migrations, in January. Thence they move eastward in detachments, and by the end of April swarm in countless myriads along the whole American seaboard. The movement of the main body is heralded by flocks of sea-fowl which hover above them. The teeming waters for miles around are rippled by the moving mass, and become iridescent with the sheen of their silvery scales, which reflect the sun's rays in splendid colors, as the shoal alternately rises and sinks for a few minutes upon the ocean waves.

The Dutch were engaged in the herring fishery as early as 1164, and for a long period prosecuted it with greater success than any other nation. With the progress of the Reformation in Europe, and the decay of the Lenten observances of the Catholic church, the demand fell off, and the herring fisheries are now less extensive than formerly. Early in the fifteenth century a Zealand fisherman, of Biervliet, named Benkels, or Bernkels, introduced, or revived, the custom of pickling herrings, for which discovery Charles the Fifth eat a herring over his grave, and raised a monument to his memory.

The Dutch herring fishery reached its highest prosperity about the year 1618, at which time as many as 3,000 boats, manned by 50,000 or 60,000 men, are said to have been engaged in it, and according to other accounts, which are evidently exaggerated, six or eight times that number. Other European nations have also been at times extensively employed in this

* Third Annual Report of Boston Board of Trade, for 1857.

branch of the fishery, but at the present time the British herring fisheries are the most extensive in the world. Since the middle of the last century it has been prosecuted by several wealthy corporate companies, aided by most liberal bounties, and supervised by a "Fishers' Board." The bounties were repealed in 1830, in which year the total quantity of herrings cured was 329,557 barrels, and the quantity exported was 181,654 barrels. These amounts were much increased the next year. About 400,000 barrels are now annually taken and cured in Great Britain.

On the coast of Newfoundland, where immense schools of herring appear early in the spring and furnish food for the cod, which pursue them close into the shore, they are chiefly caught by the resident fishermen for sale to the "bankers" and shore fishermen as bait for codfish. On the southern and western coasts of the island hundreds of barrels of live herring, of good quality, are often turned out of the seines in which they are taken, the people not deeming them worthy the salt and labor of curing. From this fishery, which is not pursued as a distinct branch of business, but might be made very profitable, our fishermen are excluded by the great quantity of ice in the Gulf until the season is past. In the Gulf of St. Lawrence herring are also found so soon as the ice disappears, and here, particularly at the Magdalen islands, the Americans have long carried on a profitable herring fishery. The herring arrive there in April to spawn, and during their stay, which lasts about ten days, the waters are nearly solid with them, while the beach, when the wind blows on shore, is in many places covered two or three feet deep with their spawn. During their sojourn any quantity can be taken, but they are at that season generally poor. Their offspring, which inhabit the bays and harbors, become quite fat, being protected from the larger fish by the shallow water, while they become the tyrants of the small. These herring, being poor, are easily preserved by being smoked or "dry-salted," and will keep in hot weather. They are not much used where the better qualities can be obtained, and are never compressed for their oil. They are principally sold in the West Indies or in South American markets. In 1839 Captain Fair, of the royal navy, found at the Magdalen islands, chiefly at Amherst and House harbors, on the 19th of May, about 146 sail of American fishing schooners, of from 60 to 80 tons, and each carrying seven or eight men. Among them were only about seven belonging to the British possessions, chiefly from Arichat, Cape Breton. The American schooners were computed to average nearly 700 barrels each, or in all about 100,000 barrels, valued at $100,000, as the product of 10,000 tons of shipping and 1,000 men, several of which by the 27th had completed their cargoes and sailed.

The best quality of herrings are taken in the Bay of Fundy and Passamaquoddy bay, the waters of which in the spring are literally alive with young herring, which feed and fatten on the shrimps brought in by the full tides. The spring herring are of large size and full of spawn, which abound in the harbors of Nova Scotia and neighboring provinces in May, are lean and less esteemed than the fat fall herring. A small variety, very fat and delicious, enter the Digby gut about the end of May, and are caught in great quantity on the shore of Clements, in Annapolis basin. They are smoked and cured as red herring, and packed in boxes of half a bushel each, containing about 200 in number. Of these, 100,000 boxes have been exported in some years, but are now less plentiful than formerly. Many herring are taken in St. Mary's bay and the basin of Minas. In 1805 and two following years an average of 10,410 boxes of smoked fish were exported from Nova Scotia. The provincial laws respecting the inspection of fish have given them a reputation in foreign markets. Of the several species of this fish taken in the waters of the United States, the principal is the *Clupea elongata*, the representative of the common herring, *(C. harengus.)*

By the Dutch and English, herring are principally caught in drift nets, which the former make of coarse Persian silk, as being stronger than hemp, and 500 to 600 fathoms in length. These are blackened by smoke to disguise them, and in the evening are set, being buoyed up by empty barrels and stretched by weights, so that the upper margin floats just at the surface. The darkest nights, and when the surface is rippled by a breeze, are considered the most favorable. Fishing by day with these gill-nets is prohibited in England. The fish are sometimes attracted towards them by lanterns, and in the morning the nets are drawn in by a windlass. Great quantities are sometimes meshed in this manner.

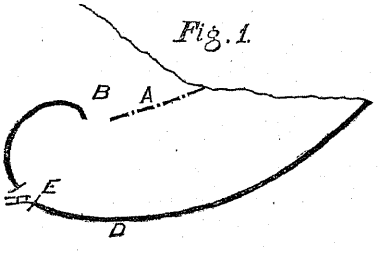
In American waters herring are at present principally taken in weirs, but formerly by "torching," or driving, which was as happy a union of business and pleasure as can well be imagined. Both systems take advantage of well-known habits and instincts in the herring. The method of torching was based upon their known fondness for the glare of light, which in moving rapidly kept them in straight lines under it, and thus enabled the dipper to scoop them up with hand-nets at his pleasure. The system of weirs also avails itself of a knowledge of their habitual movements, the weirs being so constructed as to allow them to get in and prevent their escape. It is impossible to describe the interest and excitement attendant upon the former mode of fishing, which must be seen to be appreciated. The scene as described by a correspondent* who has participated in the sport in Passamaquoddy bay was one of the most striking and picturesque. The boats selected for the purpose were fast-rowing boats, carrying from 25 to 30 barrels, and manned by six men, four oarsmen, a dipper, and skipper. Over the side of the boat, near the bow, projected the "dragon," which was made of iron network, containing the torch or other inflammable material, ready to be enkindled as soon as it was dark. The oarsmen face the hinder end of the boat, and do nothing but row, which they do with a right good will. The skipper sits in the after part of the boat, facing forward, and steers her in the proper direction. The dipper stands forward, attends to the light, and gives directions as to the course and speed of the boat. As soon as it is dark hundreds of lights, as if by magic, spring up in the bay, a sheet of water some three miles broad and seven long, dotted with islands, the land indented with coves. When there are many boats together, the spectacle as seen from the neighboring heights is most singular and romantic. The bright red glare of the torches reflected from the surface of the water strongly contrasts with the darkness which envelops all other objects. The lights seen darting in different directions

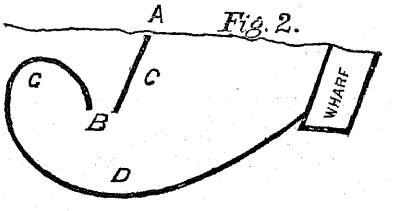
* A. R. Hallowell, esq., of Bangor, Maine.

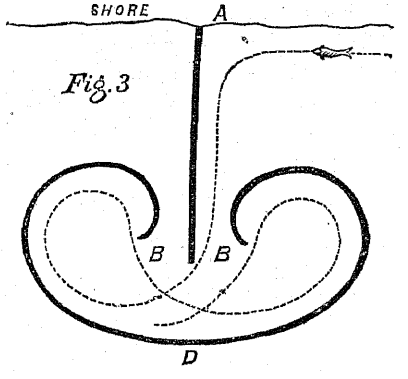
as the boatmen urge their way to the shore, swiftly crossing and recrossing each other—now disappearing and again appearing among the islands, as if by enchantment; at one time tinging the tree-tops just enough to make darkness visible as they pass behind the islands; at another revealing in dim outline, as they near them, the forms of vessels, some at anchor and others under sail, the whole scene changing as it moves around the bay—forms a panorama of novel and animated character. To the participants on board the boats the contest is equally lively and exciting as the boatmen strive to outstrip each other in the chase, or manœuvre to divide or lead off the shoal by crossing each other's course. As the boats begin to move the herring appear, their size, shape, and movements being distinctly seen as they rise up under the light and appear to be rushing towards it from every direction. The water is sometimes so solid with them, that herring which are thrown out of the water by the oars lie upon the backs of others, struggling sometimes for seconds before they can get into the water again. The boats are often so guided obliquely towards the shore as to force the fish towards it, and as they press to keep off, the shoal becomes almost solid, while the herring seem to participate in the fatal sport. The dipper now performs his part. Filling his dip-net, he rests one side of the bow upon the gunwale of the boat, and taking the other side in one hand and the bag of the net in the other, rolls them into the boat, half a barrel to the net-full. Thirty barrels have thus been taken in forty-five minutes. So many live herring in a boat, by their flipping and drumming, make music which is their own requiem. As the lighter and faster boats will lead the shoal from the partially laden, the boatmen ply their oars with all their might, while the dipper cries "Give way, men; give way!" The boat almost springs from under them; she rushes on like a meteor, and thus continues until she loads and lands.

This mode of taking herring has now given place to the less exciting but more profitable one by weirs. In Passamaquoddy bay, where herring have abounded since the first settlement of the country, and have not diminished in quantity or quality, because their breeding grounds are not disturbed, little is done in fishing until about the first of August. The season usually lasts until the end of November, and in some seasons the last of December. The tide there ebbs and flows from 20 to 28 feet, and at the head of the Bay of Fundy to about double that height. The weirs are built upon a flat extending fifty rods to low-water mark, over which the tide flows 20 to 25 feet, leaving it dry at low water. Commencing below low-water mark, 75 to 100 feet from the bar or beach, in water several feet deep, piles are driven down eight feet apart, between which brush is interwoven or closely wattled from the bottom to some distance above the water, thus enclosing an elliptical space always covered by water, called the bunt, and intended to preserve the captured fish alive until they are taken from the weir. From the bunt or deepest water, wings of wattled work sweep inwards towards the bar or beach at high-water mark, in such a way as to present an open passage for the herring into the enclosure, as they pass up with the tide. The two wings of the weir are so directed inward at the entrance as to guide the fish readily into the enclosure, and at the same time prevent their egress by continually directing them towards the bunt, in accordance with a well-understood habit of the herring, which will never turn at right angles while moving in shoals. The accompanying diagrams will serve to illustrate the shape and position of the weirs, and the manner in which the fish become bewildered within the weir and retire to the deep water in the bunt. As the herring follow the long line of obstruction from the bunt at D to the incurvature or hook C, they are constantly directed across the area back to the bunt, and few ever find their way out, unless the entrance is very wide.

DIAGRAMS.







Explanations.—Fig. 1.

A.—The bar, a dotted line.
B.—Mouth of the weir.
C.—Hook.
D.—Bunt, deepest water.
E.—Gate to weir to go in and out. This weir is probably 400 yards long and 75 feet from the bunt to the bar.

Explanations.—Fig. 2.

A.—The beach and bar across the mouth of the weir.
B.—Mouth of weir where the herring come in
CC.—The hooks of weir to prevent herring from getting out.
D.—The bunt of weir—deepest water in the weir.

This figure represents J. Treat's weir in Eastport, Maine, formerly Allan's island. It is about 250 feet the longest way; from high-water mark to the bunt 100 feet or more. The mouth of the weir is 40 feet wide, with a drop to it. This weir has taken as much as 150 hogsheads of herring at one haul.

The entrance is about 40 feet wide, to admit large shoals, and is often closed after they are in by a spring-net. Many of the weirs are covered above the brush-rack with a seine. They are often 500 to 700 feet in circumference, and cost from $500 $700 each. As many as 500 to 600 barrels of herring are often taken in one of these weirs in a single tide, which are

dipped out with a scoop-net into boats admitted through a gate in the bunt. The principal seat of the herring fishery of Maine is in Washington county, and the neighborhoods of Lubec, Eastport, and Machias. The total catch of the State in 1860 was reported at 525,974 boxes of smoked herring, valued at about $118,000, in addition to a few thousand barrels of pickled herring. Of the whole quantity, 398,174 boxes were returned by Washington county, which reported $301,517 as the value of all kinds of fishes taken by its fishermen. Sagadahoc returned 90,000 boxes, and Knox county 7,000 boxes. The average value was less than twenty-five cents a box. In the State in 1850 there were returns of 29,685 boxes of herring taken. The total value of the smoked and pickled herring taken in the waters of Maine does not probably fall short of $200,000 annually. This is the value estimated by Mr. Hallowell, who includes also the value of oil made from the herring by compression. The annual catch in Passamaquoddy bay is computed to be equal to 75,000 barrels, the market value of which is 170,000. The quantity of herring taken being much in excess of the demand, about two-thirds of the catch, or 50,000 barrels, are now converted into oil, which sells at $20 to $25 per barrel at the manufactory. This manufacture of herring oil is of recent origin. The first press was introduced at Passamaquoddy in 1862 by U. S. Treat, esq. At the present time almost every man engaged in the herring fishery has them. The market value of the oil has almost doubled in price since the first year. It is thought that fully 50 per cent. of the fish taken in future will be compressed for oil, which will cause a falling off in the number of boxes of smoked fish prepared for market. When herring are to be compressed they are red-salted in the same way as for smoking, but without being scaled, and are allowed to lie three or four days. The apparatus, including two presses, two screws, a kettle holding 70 gallons, &c., costs $50. With this, two men will make from 35 to 40, or, if the herring be very fat, about 70 gallons of oil in a day. Fourteen presses, of five gallons each, is, however, an unusual day's work; three gallons each being the average of a season. The pomace or refuse of the press is used for manure, and sells for $4 per ton. The poggy is preferred for the manufacture of oil, and considerable quantities of poggy oil are made in Maine, but that fish is now much less plentiful than formerly.

ALEWIVES.

The alewife, *(Clupea vernales,)* belonging to the same family with the common herring, and forming a link between it and the shad, though less valuable than either, ascends our eastern rivers in great abundance in the spring. Unlike the herring, it deposits its spawn in fresh water. In former years more of this fish were taken and packed in Massachusetts than of any species of the same family. The quantity inspected in 1832 was 1,730 barrels; in 1833, 2,266 barrels, and in 1835, 5,600 barrels. Many were taken in the Charles river, at Watertown; the inspections in ten years preceding 1836 averaging 700 barrels annually. They were first pickled, then salted, barrelled, and sent to the West Indies, where they sold for $1 50 to $2 per barrel. Twenty-five years before they were so abundant there as to be sold for twenty cents the hundred, and were shipped in greater quantities. The building of dams and factories on the rivers caused their partial disappearance. In 1854 Massachusetts employed 485 men in taking alewives, shad, and salmon to the amount of 52,278 barrels and 4,802,472 in number, the total value of which was $73,156. They were principally taken at Watertown, Cambridge, Medford, Middlebury, Tisbury, Berkeley, Dighton, Gloucester, and Lynn. Upwards of half a million alewives were returned in 1860 by Sagadohoc county, in Maine, chiefly by Bowdoinham. Many of these fish from our eastern ports are sold in Baltimore for more southern markets, where they are in demand on account of their cheapness, being sold at $3 50 to $4 50 per barrel in ordinary seasons. But on account of their inferior value as a commercial article, much of the catch of these fish is not reported. Many alewives are also taken on the eastern shore of Maryland, St. Mary's county employing in 1860 eighty hands and eight seines, which caught about 16,000, valued, in the fresh or green state, at $4,000. The season begins in September and lasts about two months.

SHAD FISHERY.

Among the most valuable of the same family of fishes is the shad, which at certain seasons abounds in all the rivers of our eastern seaboard. The common European shad *(Alosa vulgaris)* is represented in American waters by a somewhat smaller but more delicately flavored species, the *Alosa sapidissima.* Other varieties of commercial value are the *A. tyrannus,* which is used for food, and the *A. menhaden,* chiefly employed as bait for mackerel and for manure. The shad arrives in our northern waters about the end of May or first of June, and for four or five weeks is taken in all the rivers as far north as Nova Scotia. Being a timid fish, the shad has become less plentiful than formerly, in consequence of the increased number of steamboats, factories, and other improvements on our bays and rivers, and of the various contrivances for catching them. They are chiefly taken with seines, which are of two kinds. One of these is made of great length and depth, in order to surround a whole school of shad where the water is from five to seven fathoms deep. The other kind, or gill-nets, are intended for meshing the fish which, in attempting to run through them, are caught and held by the gills. These are trailed from a boat or vessel and kept in a vertical position by floats and weights. The long floating "purse seines" require a crew of six men to manage them, and often enclose a great number of fish. As many as 500 barrels of shad have thus been taken at a single haul; but sturgeons, sharks, and other large fish sometimes break through them and release many of the pent-up fish.

In the rivers at the head of the Bay of Fundy, where many fine shad are taken, the gill-nets are sometimes made stationary and placed transversely to the stream, on a flat or bar, over which the tide flows many feet in depth. The shad are always meshed in the ebb of the tide. In the deep, narrow rivers at the head of the Bay of Fundy, where the tide ebbs and flows fifty or more feet in depth, seines are sometimes extended entirely across the channel from bank to bank. During the

influx of the tide, they lie flat upon the bottom of the river, the upper margin directed up stream, and on the turn of the tide, at high water, they are sprung to a vertical position by means of boats and buoys, thus intercepting the return of nearly all the fish in the stream. Many thousands are thus taken in a single tide, although the sturgeon often opens vast rents in the seine, admitting a pretty general escape. Many shad are also taken in weirs, in Penobscot bay. The town of Richmond, in 1860, returned 32,000 as having been taken in four weirs. Large numbers of these fish were formerly taken in the Charles river, at Watertown, Massachusetts, and sold in Boston market for twenty-five cents each. Many were also caught at Taunton, where they were sometimes sold from the seines as low as fifty cents a hundred. Large numbers of shad and manure fish are taken in the harbors and rivers of Long Island sound, by the fishermen of Connecticut, and in the Delaware and Susquehanna rivers. In 1850, Connecticut returned 243,448 as the number of shad, exclusive of white fish used as fertilizers, caught in the State. North Carolina returned the same year 56,482 barrels of shad and herring.

The total value of shad fishery of the United States in 1860 was 433,671. Of this amount North Carolina produced upwards of one-fourth, or $117,259 Florida, $68,952; New Hampshire, $64,500; New Jersey, $38,755; and Virginia, $68,210. The average value returned in many places was about $12 per barrel, and $7 per hundred for fresh shad.

Of the alosa menhaden, an inferior species, known by the several local or popular names of mossbunker, pauhagen, hardhead, white fish, and bony fish, large numbers are caught for mackerel bait, and still larger quantities for manure. In former years they have been sold as bait to Massachusetts fishermen at $2 to $4 per barrel. Many of them are also packed and sold as food. For that purpose 1,448 barrels were inspected in Massachusetts in 1836. As fertilizers these fish have been caught and hauled upon the land in the neighborhood of Cape Cod for upwards of twenty years. A single fish of medium size has been considered equal, as a fertilizer, to a shovel-full of barn-yard manure. Their use for this purpose is now very extensive on the seaboard, especially in Connecticut, along the sound. In 1850, Connecticut returned nearly 37,000,000 of white fish, caught chiefly for that purpose, and Rhode Island reported 187,000 barrels of menhaden taken. In 1860, Middlesex, New Haven, and New London counties, Connecticut, together returned about 27,000,000 of white and manure fish taken, valued at $288,589, in addition to fish converted into $31,500 worth of oil and fertilizers in New London county. At the average reported value of one dollar per thousand, these would make an aggregate of about 60,000,000 of mossbunkers taken in the State in the year, but the actual value is nearly $2 per thousand. Vast numbers of these are taken at Sag Harbor and the shores of Long Island. In 1849 an attempt was made at New Haven, by Mr. Lewis, to manufacture a portable manure from the white fish, and a quantity of the fertilizer, containing, according to the analysis of Professor Norton, of Yale College, an equivalent of 12.42 per cent. of ammonia, was put into the market. For some reason the enterprise was abandoned. In 1851 or 1852 a second effort was made by a Frenchman, named De Molen, who had, in 1856, an establishment near the Straits of Bellisle, employing 150 men in manufacturing *taugrum*, or fish manure, from herrings or herring refuse, large quantities of which were shipped to France. Pettit & Green, in England, also engaged in the manufacture of fish manure, by a patent process, involving the use of sulphuric acid. By the more simple process of De Molen, and we believe of Lewis, the fish were boiled or steamed into a pasty mass, from which oil was then expressed and economized, and the cake or pomace, after being dried in a current of hot air, was finally ground into powder. Fish manure has been somewhat extensively manufactured at Concarneau, in France, from the refuse of sardines and other fish; at Christiana, in Norway, and at Oldenburg, on the North sea; the last principally from crabs, dried and ground, and thence called *granet guano*. More recently, commercial fish manure has been made in New Jersey from crabs, and called *cancerine*, and also by the Narragansett Company, in Rhode Island. The last of these made two manures, "fish guano," and "fish compost;" the former a concentrated article, made by "chemically treating, cooking, drying, and then grinding the fish to a powder;" the latter consisting of the cooked and dried fish mixed with equal quantities of street sweepings, and sold at $2 per barrel of 200 pounds. Each barrel of the latter contained the desiccated organic matter of two barrels of fish, with a variable amount of the fertilizing salts of ammonia, potash, lime, or their elements. In 1860 New London county, Connecticut, returned 31,000 bushels of fish guano, made at an average price of eighteen cents per bushel, and 2,120 barrels of oil from the same source, valued at about $12 25 per barrel, or $31,000 for the two articles.

MACKEREL FISHERY.

The mackerel family *(Scombridæ)* in its several species constitutes a tribe of fishes not inferior in commercial value to those of which the cod and the herring are the representatives. The true mackerel *(Scomber scombrus)* is a migratory fish of great fecundity and peculiar habits, which render the business of fishing for them a precarious one, involving considerable outlay and frequent loss. Though voracious, the mackerel is a capricious feeder, at one time taking the hook readily, at others refusing it altogether. Equal uncertainty exists as to the locality and numbers in which it may be found, whence it happens that mackerel fishers sometimes make quick and abundant fares, and at other times scarcely pay the cost of outfit.

The common English mackerel *(S. vulgaris)* is represented very abundantly along our coast by the *S. vernalis*, which begin to be taken in quantity about the middle of June; although they are supplied to our eastern markets in more or less plenty throughout the year. The chub mackerel *(S. grex)* is a smaller species, and the Spanish mackerel *(S. colias)* is much esteemed, but more rare. Of the genus tunny *(Scomber thynnus)* the common tunny *(T. vulgaris)* is a mackerel of enormous size and excellent flavor, which is sometimes taken in our waters, and known in New England as the horse-mackerel and albicore. A specimen of this fish, taken near Cape Ann, was 15 feet long, and weighed 1,000 pounds.

On the coast of England mackerel are caught with gill-nets of great length, chiefly during the night, by the aid of torch-lights, as in the herring fishery. The United States mackerel fishery is mainly carried on from New England, and chiefly from Massachusetts. The fish are principally caught like cod, with the hook and line, each fisherman being provided with two

lines. The boats are small craft of fifteen or twenty tons, sometimes locally called *chebacco boats*, the crews of which go upon shares, as in the cod fishery. They receive, we believe, about one-half the proceeds, and are engaged about nine months in the year. As mackerel always swim in swarms or *schools*, which can often be seen half a mile distant, the fishermen endeavor to run into them. An ingenious mode of arresting the onward progress of a school, or of raising one, was many years ago devised by American fishermen, and is always practiced by them. It consists in throwing among the fish large quantities of bait, consisting of old pickled herring, "hard head," or other fish, laid in for the purpose, which is minced, or ground up fine in a "bait mill," invented for that purpose. Salt is sometimes sprinkled upon the water with the same view. The hooks are baited with bits of mackerel, pork, &c. If the fish bite freely, which they sometimes refuse to do for days or weeks together, especially when "schooling," and seldom except in the early morning or just at night, the fares are often quickly made. Forty or fifty barrels are sometimes taken by a single crew of eight or ten men in a few hours, and a cargo is made in four or five days, when they take the hook freely. In the Gulf of St. Lawrence the fishermen usually split, dress, and salt the fish on board the vessel as soon as the fish cease to bite, and while under way. When the vessel reaches port they are sorted into three different qualities, put up in barrels, inspected, and branded according to quality by the proper officers. The greater part of the pickled fish, caught and cured by our fishermen, is consumed at home. Of the better qualities, however, considerable quantities are sold at New York, Philadelphia, Baltimore, New Orleans, and other southern and western cities, and thence distributed over the country. The inferior qualities are exported to the West Indies.

The mackerel fishery has long been carried on from the seaports of Massachusetts. In 1770 the town of Scituate had upwards of 30 sail engaged in it. In May, 1828, Congress authorized special licenses to be granted to vessels in the mackerel fishery, in order to keep them separate from those in the cod fishery. When not otherwise employed, they were allowed to fish for cod, but could not claim the bounty allowed to cod fishermen. But the law has not been rigidly enforced. The first separate returns were not made until 1830, when the enrolled and licensed tonnage employed in the mackerel fishery of the United States was 39,973 tons, from which it had declined in 1841 to 11,321 tons. In 1850 this branch employed 58,111 tons of shipping, nearly one-half of which, or 26,327 tons, belonged to Barnstable county, Massachusetts. That county in 1836 had 206 vessels in the mackerel fishery, 98 of which belonged to Provincetown. The State in 1855 had engaged in the cod and mackerel fisheries 1,145 vessels, measuring 77,936 tons, and employing 10,551 men and a capital of $3,696,436.

The quantity of pickled fish, chiefly mackerel and herring, exported from the United States in 1790 was 36,804 barrels, valued at $113,165. In 1831 the quantity so exported was 91,787 barrels, 8,594 kegs, worth altogether $304,441. The mackerel fishery of Massachusetts reached its maximum productiveness in the year last mentioned, when the number of barrels inspected in the State was 383,559. During the next ten years it regularly declined to 50,992 barrels in 1840, which was the lowest production of any one year. The total product of pickled fish in the United States in that year was 472,359½ barrels, and the quantities exported were 42,274 barrels and 2,252 kegs, worth $179,106. By the census of 1850 Massachusetts returned 236,468 barrels of mackerel taken, Maine 12,681, and New Hampshire 1,096 barrels, of which the total exports were 22,551 barrels, valued at $83,759. This branch of the fishery is subject to great fluctuations, and we consequently find the product of the mackerel fishery in Massachusetts in 1860 only reached 111,375 barrels, chiefly produced in Essex and Barnstable counties. The returns for Maine in that year footed up 23,653 barrels. Bristol county, Rhode Island, returned 15,000 barrels of mackerel.

THE SALMON FISHERY.

The waters of North America contain a greater number of species of the trout family *(Salmonides)* than those of any other country. They are all esteemed for their delicacy of flesh, and are found in nearly all of our northern rivers and lakes. The largest and most valuable of the several genera is the common or true salmon, *(Salmo salar.)* This beautiful fish, which is the delight of the angler, lives ten or twelve years, and in Europe often attains great size—the largest specimen on record having weighed 83 pounds. The largest salmon taken in our rivers have not exceeded 70 pounds—the average weight being considerably less, or from 12 to 20 pounds. A British author has ranked the salmon fishery next to agriculture as a source of food—an estimate less applicable to our country than to Scotland, the rivers of which alone have been computed to furnish salmon to the annual value of $750,000. This fish never enters the Mediterranean, but is found on the coast of Europe, from the Bay of Biscay to Spitzbergen. The salmon is taken in most of the rivers and estuaries of North America, from Greenland to the Kennebec, in Maine, on the eastern coast, and from the Columbia river northward, on the Pacific seaboard. It is found in all the tributaries of Lake Ontario, its further progress being arrested by the Falls of Niagara. It is very abundant in the Restigouche and the numerous other streams falling into the Bay de Chaleur, in the Saguenay, and all the rivers on the north of the St. Lawrence eastward to Labrador, and in the St. John's river and its tributaries below the grand falls. The St. John's furnishes nearly one-half of all the salmon brought to our markets, and its principal branch—the Aroostook—is the richest salmon fishery on the Atlantic coast. About 40,000 salmon were caught in the harbor of St. John in 1850, and shipped fresh in ice to Boston. From the British provinces the imports of pickled salmon in the same year were 8,287 barrels, valued at $78,989, in addition to considerable quantities of smoked salmon. The cold and limped waters of many of the streams of British America, and the absence on most of them of dams, mills, steamboats, and other improvements, invite the presence of the salmon, which is a timid fish, and quickly forsakes its accustomed haunts when disturbed. For this reason these fish have now nearly forsaken the Merrimack, the Cumberland, the Thames, the Hudson, the Susquehanna, the Delaware, and other Atlantic rivers of the United States in which they were formerly found and taken in considerable numbers. Few are now caught south of the Kennebec. In 1818, 2,381 barrels of salmon were inspected in Massachusetts. They were

formerly so abundant in the Connecticut that it is said one shad was considered equal in value to three salmon, and the day laborer stipulated that salmon should be served to him only four days in the week!

The domestic salmon fishery of the United States is at present confined principally to the rivers of Maine and those of the Pacific States. Salmon are perhaps more numerous in the Columbia river than in any other in the world. An early navigator is said to have once bought there a ton of salmon for a jack-knife! The salmon is caught as it ascends the rivers in the spring to spawn. It is then in good condition, but is comparatively lean and worthless when it returns, and always in proportion to the distance and length of time that it has been absent from the salt water. It invariably returns every season to the same stream in which it was bred. The same habits characterize its congener, the sea trout, and others of this family. In Europe salmon are usually caught in nets, as many as 300 in Norway and 700 in the Tweed having in that way been taken at a single cast of the net. Seines are sometimes stretched across the rivers, in which they are meshed or gilled. In Scotland salmon are often speared or harpooned, in which way the American Indians and Canadians catch great numbers, though regular fishermen generally use the net. An Indian will often take one hundred fine salmon in a night, by torch-light, with the spear. Genuine anglers, of course, use only the rod and reel, and a silk or hair line 300 feet long skilfully baited with an artificial fly. In Scotland and at the mouth of the St. John's, and in other estuaries, trolling with drag-nets is practiced. In Great Britain salmon are also taken in weirs or salmon traps—a method now almost exclusively adopted in Maine. The season and manner of catching salmon have, in England, been strictly regulated by several statutes, intended to prevent poaching and the extermination of the fish. An early statute of this kind prohibited the sending of any salmon to a fishmonger which weighed less than six pounds. If the value of this excellent fish were better appreciated in the United States, its rapid decrease would be checked by a few salutary regulations of the local or State authorities, as has been done in the British provinces.

In the first settlement of Maine, when salmon, bass, shad, and alewives were much more abundant than at present in the Penobscot and its branches, they were caught by spearing them in the Indian method. Nets were afterwards used, and these were followed by what were called half-tide weirs, built of stakes and brush across deep coves, up and down the river. In 1811 an improvement in weirs for catching fish was introduced there by Hawley Emerson, from Phippsburg, on the Kennebec, who built the first three-pound weirs on Treat's flats, at the mouth of Marsh river. In August of the same year he took out letters patent for the improvement of which he claimed to be the inventor. From that time the fishing interest became an important source of income to the inhabitants of all the river towns below Bangor, and the foundation of many fortunes. In 1820 the fish sold from the town of Bucksport alone amounted to upward of $30,000 in value. Improvements were, from time to time, made on Emerson's plan, and twine came to be used, instead of brush, as less alarming to the fish. Weirs are now constructed by running a barrier, resembling a pale-fence, from the bank to the middle of the river, with two circular enclosures, one considerably larger than the other, and connecting with each other, the smaller lying furthest up stream. The larger one is filled around with brush, giving it a dark appearance, whilst the smaller is encircled with a twine net, and is light in appearance. It has, moreover, a flooring raised a foot above low-water mark. After groping around the dark enclosure, the fish is attracted into the lighter one, with the prospect of escape, and while playing around in it, in fancied security, is left high and dry on the raised bottom by the falling tide.

The total value of the salmon caught in Maine at the present time is estimated by one of the principal dealers at $16,000 per annum, about three-fourths of which is supposed to be taken in the Penobscot, chiefly in weirs, and from April to August, inclusive. Bangor and Bucksport are the principal seats of this fishery. The average size of the salmon is 13 pounds, and the average price 20 to 25 cents per pound. Fresh salmon, in our eastern markets, have often been sold in the first of the season as high as $1 per pound, and when plentiful, at other seasons, sometimes as low as 8 or 10 cents per pound.

Some successful experiments have been made within a few years in the artificial breeding of salmon, which deposits its spawn in fresh water during the autumnal and winter months. The ova, of which each individual deposits from ten to twenty-five thousand in a season, are in consequence developed but slowly, and are subject to more casualties than those spawned in the spring and summer seasons. We believe the Dennysville river, in Maine, has been artificially stocked with salmon; and one or more large lakes emptying into the St. Croix have also been appropriated to the same use by Messrs. U. S. Treat & Son, of Eastport, Maine, who propagate other migratory fishes in the same way.

The salmon fisheries of California are principally carried on upon the Sacramento and Eel rivers, though other rivers of the State abound in salmon. On the Sacramento, for a distance of fifty miles, extending south, from a point ten miles north of Sacramento city, during five months, from February to April, and from October to November, inclusive, in 1857, the catch was estimated at 200,000 salmon, of the average weight of 17 pounds, or an aggregate of 3,400,000 pounds, worth, at five cents per pound, $170,000. The amount of salmon packed in the same season, exclusive of fresh and smoked sent to market, was 1,500 barrels. The Eel river fishery, which yields salmon of superior quality and size, weighing 60 to 70 pounds, produced in September and October of that year 2,000 barrels of cured fish, besides 50,000 pounds smoked for home consumption, principally in the northern mines. These fish are shipped to Australia, China, the Sandwich Islands, and to New York, and sold at remunerative prices. The exports from the State in 1857 consisted of 77 hogsheads, 1,745 barrels, and 608 packages.* The State returns of 1860 were from seven establishments, averaging ten hands each, and together employing a capital of $17,500, the annual product being $18,940, an amount probably below the actual value of this fishery.

Oregon, in the same year, reported two fishing houses, with twelve hands, and a capital of $14,720. They caught 1,335 barrels of salmon, worth $13,450. In Washington Territory, five establishments, having $18,000 in capital, and fifty-three hands, took 1,800 barrels, valued at $17,450. The rivers, sounds, and inlets of Oregon and Washington abound in fish, including

*California State Register for 1857.

several kinds of salmon, salmon trout, herring, shell-fish, &c.; the fisheries of Puget sound and the Columbia river and its branches being almost unequalled. Salmon are very abundant in the Willamette river, a southern branch of the Columbia, below the Cascade mountains. Oregon City, at the falls of the Willamette, has a valuable salmon fishery. These fish ascend all the branches of the former, not interrupted by falls, to their headwaters, and are very numerous in Salmon river, a tributary of the Saptin or Lewis fork of the Columbia, rising near the sources of the Missouri in the Rocky mountains, and also in the Umpqua river towards the southern border of Oregon. Salmon make a principal part of the food of the Indian tribes, who are very expert fishermen and spear great quantities of the finest salmon as they leap the cascades in the spring. They use spears made of bone or horn attached to poles twelve to fifteen feet long. On no account will they sell to a white man a salmon of the first catch until they have made their annual thanksgiving by a solemn "salmon feast" or "dance." They catch many fish as they return, poor and languid after spawning, towards the ocean, which they dry or smoke in their tents and store away for winter use. The salmon fishery in that region begins in May and lasts until October. Many of the fish are salted and sent to San Francisco, the Sandwich islands, and other Pacific markets, but the scarcity of salt has heretofore proved a hindrance to the fisheries in the Pacific States.

TROUT.

Several other species of salmon of less commercial value than the foregoing are taken in the rivers and lakes of the United States. Salmon or sea trout *(S. truttæ)* are caught at Cape Cod and elsewhere to some extent, but, like the salmon, are most abundant and of larger size in the pure cold streams discharged into the gulf of St. Lawrence from Cape Breton, New Brunswick, Gaspe, and Labrador. To those who fish for salmon with the fly in those waters the trout becomes troublesome below the larger cascades, which it is unable to leap with its nobler kinsman, the salmon. Marguerite or Salmon river, on the gulf shore of Cape Breton, is much resorted to by fly-fishers for sea trout, many of which there weigh from 2½ to 3½ pounds. The common trout *(S. fario)* which abounds in England sometimes attains there a weight of 25 pounds, but its nearest representative in our waters, the common brook trout *(S. fontinalis)* in running streams, rarely weighs four pounds, although it often much exceeds that in the small lakes. It is frequently mistaken for the Mackinaw or great lake trout, *(S. amethystus,)* which is the largest fish of the salmon kind. It has been taken of the weight of 120 pounds, but is now seldom caught weighing 80 pounds, the average being 10 to 20 pounds. This trout abounds in Lake Huron, where it is caught in large numbers and shipped to eastern cities. A small species called lake trout *(S. confinis)* is taken in the smaller lakes of the northern States. A very fine flavored species, *(S. sisquoette* or *siskawit,)* weighing 8 to 10 pounds, which is taken only in Lake Superior, is by some thought superior to any in the lower lakes. Many of these are exported from Lake Superior. The capelin *(Mallotus villosus)* belongs to the same family, and is caught in large quantities on the coasts of Labrador and Newfoundland as bait for cod.

WHITE FISH.

The celebrated white fish of the northern lakes belongs to a genus *(Coregonus)* of the salmonidæ, in which are included many species found in our own lakes and those further north, as well as in northern Europe. One of these *(C. Otsego)* is caught in the lakes of New York, where it is called Otsego bass. The white fish has been prized for its excellence since the early explorations of the French in the lake regions of the northwest. Michigan, on account of the extent of the lake shore of its two peninsulas, enjoys a valuable source of wealth in her white fishery, which has grown rapidly, but is still in its infancy. The American Fur Company many years ago engaged in the fish trade in this region. The quantities of fish shipped from the upper lakes in 1836 were 12,200 barrels, in 1837, 14,100 barrels, and in 1840, 32,005 barrels, principally white fish. At the average price of fish ($8 per barrel) during the preceding five years at Detroit, the value in the latter year was $246,040, added to the wealth of Michigan from this source. The census returns of 1850, which were doubtless defective, showed a catch in that State of 15,451 barrels of white fish. In 1860 the marshals reported 186 fishing establishments in Michigan—a greater number than any other State except Maine. Their united capital was $209,769, and they employed 929 male and 63 female hands, the product of whose labor was 67,444 barrels of white fish, valued at $456,117. In Wisconsin, the same year, 13,235 barrels of white fish and trout were taken by twelve fishing establishments, principally in Door county, and valued at $93,374. New York reported white fish caught to the value of $36,000, and Indiana to the value of $22,500, making the total value of this fishery in the United States to be $662,991. Many of these fish are also taken in the Pacific States. In addition to siskawits, Mackinaw trout, white fish, muskelunge, and pickerel, which are the most valuable, and are chiefly caught for pickling, the northern lakes abound in other fish, which are taken in less quantities. Among these are the pike or gar fish, roach, rock bass, white and black bass, mullet, bill fish, catfish, &c.

The most extensive attempt at artificial fish-breeding in the United States was made in the autumn of 1857 in Connecticut, under the protection of an act of the legislature, for the purpose of introducing trout, white fish, and other fish from the great lakes into the smaller lakes of that State. In November of that year five million ova of the lake trout and one million eggs of the white fish, from Lake Ontario, were deposited under intelligent direction in Lake Saltonstall, near New Haven, where, in March and April following, the young fish appeared in great numbers. Twenty million ova of the pike-perch, and half as many of the trout and white fish, were added the same year. The enterprise promised to be a favorable introduction of pisciculture in the United States; but of its ultimate success we are not informed. The enterprise was managed by Messrs. Carl Muller, of New York, and H. Brown, of New Hampshire. Experiments were made in the artificial breeding of trout by E. C. Kellogg, of Hartford, in 1855, and in 1857 a report on the artificial propagation of fish was made to the legislature of Vermont by the Hon. George P. Marsh.

SMELTS.

The smelt, *(Osmerus viridescens,)* called in some parts of the United States frost-fish, has been regarded by naturalists as a distinct genus of the salmon family. The inquiries of practical observers, particularly of Mr. John Shaw, one of the game-keepers of the Duke of Buccleugh, in Scotland, appear, however, to have rendered it tolerably certain that this delicate little fish is nothing more than salmon fry, or the young of the salmon. By ingenious experiments, repeated during a series of years, Mr. Shaw traced the development of the fish from the ovum to the adult salmon, and proved that the young of the latter up to two years of age—during which time they are called "parr," and differ in appearance from the smelt and salmon—do not collect in swarms nor leave their native fresh-water streams. In a month or two after the completion of their second year they undergo several changes, assuming increased activity, a greater elegance of form, and the silvery aspect of the smelt. In this migratory dress they immediately congregate in shoals and make their way toward the ocean. After two or three months' absence they return to their native streams increased from a few ounces to from three to eight pounds in weight, according to the length of their sojourn in the sea. In this state they are called "gilse." After spawning they again return to the ocean, and in four or five months once more revisit their native haunts grown to full-sized salmon, weighing from nine to fourteen pounds, the weight still depending upon the length of their absence in salt water, in which alone they grow and fatten. The salmon-trout undergoes in all respects a similar process of development.

Smelts are taken in great numbers in our rivers in spring and autumn, and often during the winter. During the latter season many are taken in Lake Champlain, where they collect, by cutting holes in the ice. At Watertown as many as 750,000 were taken annually in scoop nets from the first of March to the first of June. They are mostly taken at night by torch-light. The returns from Sagadahoc county, Maine, include twenty-six tons of smelts, valued at about $100 per ton, and seven tons of frost-fish, worth together $150. These little fish are taken in most of the rivers of that State, and though not reported, we are informed that the quantity annually shipped from Hampden, six miles below Bangor, on the Penobscot, probably exceeds the amount above mentioned. A species of smelt or salmon, called shrew, and so fat that, according to Captain Wilkes, when dried without salt and set fire to they will burn like a torch, were formerly very abundant in the Columbia river, on the Pacific, and are taken in vast quantities by the Indians in the northern waters of Oregon and Washington Territories.

HALIBUT.

A large number of schooners are employed in catching halibut at St. George's Banks, in the vicinity of Cape Ann and in Long Island sound. This fish, sometimes called the American turbot, has been taken of the weight of 500 and 600 pounds, but its average weight is not above 50 pounds. Before railroad communication was opened with Cape Ann they were very abundant, and being considered unfit for pickling, were comparatively little valued, many being cut loose by the fishermen and cast back into the sea. In 1837 Cape Ann had 80 large schooners, of from 60 to 80 tons burden, engaged in catching halibut for the Boston market, where they were sold fresh and smoked. In 1839 about 16,000 of these fish were taken there, equal to 800,000 pounds, which, at the average price then paid to fishermen, at two cents a pound, amounted to the value of $16,000. About that time they were discovered to exist in large shoals and of large size at St. George's Banks, and vessels were sent thither. They are sent to all our large cities both in the fresh and preserved state. In New London county, Connecticut, in 1860, there were returned 1,712 tons of halibut taken, worth about $100 per ton, or five cents per pound, $171,200. In Gloucester, in Essex county, Massachusetts, in 1855, there were caught 210 tons of halibut, valued at $25,200. Two establishments in that county, in 1860, returned an aggregate of 1,113,132 pounds, or upward of 556 tons, of which the value was $36,828.

STURGEON.

Sturgeon fishing is carried on in the Delaware to a considerable amount annually. They are caught in nets thrown from the boats, and sold to men who skin and cut them for the Philadelphia market, which employs about fifty boats. They sell for three to four cents a pound.

LOBSTERS.

The county of New London, Connecticut, returned about 178 tons of lobsters, taken in 1860, valued at $11,700, and in Maine 200,000 of these fish were taken at Cushing, valued at $700, in addition to upwards of $38,000 worth of canned and preserved lobsters. The markets of most of our maritime cities and towns are supplied with these crustacea, the value of which seldom appears in official returns. Boston receives annually some 200,000 lobsters, which are caught along the coast of Maine by fishermen sent out from Gloucester, from March to June in each year, and thence sent in well-boats to the city, where they sell at an average of five cents each.

OYSTERS.

This valuable shell-fish, which is widely distributed throughout the world, has been esteemed as an article of food from a very remote period. It was much prized by the Romans, who obtained it from their own waters, from the mouth of the Hellespont, and from the shores of Britain, where oysters were early discovered to be very abundant and of superior quality. They were imported thence during the winter packed in snow. According to Pliny, the propagation of oysters in artificial oyster-pits was first introduced by the wealthy and luxurious patrician, Sergius Aurata, who derived much revenue from his oyster-beds at Baiæ, in the Bay of Naples, and was also the first to show the superiority of the shell-fish of the Lucrine lake to those of Britain, which his countrymen considered the finest. So vast is the number of these fish annually caught that the

oyster is only saved from extermination by reason of its rapid multiplication. As many as 50,000 to 60,000 ova are said to be contained in the spawn of a single oyster. A late report to the British Association roughly estimates them at about one million, and others still higher. These ova, moreover, are very tenacious of life. The time of spawning is from May to August, during which time the oyster is said to be "in the milk," and fortunately, but erroneously, is deemed unfit for the table. Hence the notion, still prevalent, that it is only during the months which contain an *r*, that oysters are edible. They cannot inhabit fresh water; but those oysters are preferred for food which are grown near the mouths of rivers where fresh water mingles with the salt, and also those which are of medium size. Oysters are usually found in tranquil water from two to six fathoms deep, particularly in the estuaries of large rivers, where they feed and fatten upon the *confervæ*, or upon several kinds of *infusoria*. Certain species of these last are said to impart to the oyster the green color so much esteemed in the British oyster from the Orkneys and Western islands. As many as 60 or 80 species of the true oyster are enumerated. But the common edible oyster of Europe *(Ostrea edulis)* is represented in our markets by two principal species. These are the Virginia or York river oyster *(O. Virginica)* found in the Chesapeake bay and southward, and occasionally as far north as the Gulf of St. Lawrence; and the northern New York or York bay oyster, *(O. borealis,)* formerly very abundant in Massachusetts bay. The former is much the most common at the present time, and is principally propagated for the supply of our markets, being transplanted from the York river in March to artificial oyster-beds near the large cities, upon which they are dumped from schooners of 100 tons and under. The oyster attains its full size in from three to five years in its native beds, but grows more rapidly when transplanted. In either case they are often fit for the table at eighteen months or two years. The British oyster trade formerly employed about 200 vessels, of from 10 to 50 tons each, and 400 or 500 men and boys in dredging for them. It supplied 14,000 or 15,000 bushels yearly to the London market. At present it is much greater, the supply of oysters from artificial beds being estimated at 30,000 bushels, and of sea oysters at 100,000 bushels, annually. In 1852 the island of Jersey, in the English channel, employed 370 vessels, of 34,000 tons, besides many large boats, and about 1,500 men and as many women and children, chiefly in the oyster fishery of its southeastern coast.

Many oysters are also taken on the shores of France, where the natural beds some years ago became exhausted in consequence of overdredging. In this emergency M. Coste, by order of the French government, instituted some six or eight years ago, in the Bay of St. Brieuc, a system of artificial oyster culture, similar to that so long practiced at Lake Fusaro, on the peninsula of Baiæ. He planted 3,000 acres with about three million breeding oysters, and in less than six months he found each fascine of brush-wood laid down to arrest the spat, though not larger than a wheat sheaf, was covered with 20,000 young oysters, which in eighteen months more would be fit for the table. His success induced M. Coste to propose to stock not only the whole coast of the empire proper, but also those of Corsica and Algeria, with oysters. He estimated the cost of covering 12,000 acres with oysters to be only $2,000. Experiments in oyster-farming, made near the same time at the Isle de Ré, in the Bay of Biscay, have rendered that vicinity a principal seat of the oyster culture. There are now upwards of four thousand parks and claires upon the fore-shores of the island. At Marennes, on the Seudre, are extensive oyster farms and claires, devoted to the production of the celebrated *green* oysters, which derive their peculiarity from feeding in the turbid waters of the Seudre. Oyster-farming is also carried on extensively at Whitstable and Faversham, in England, by joint stock companies, and elsewhere in English waters.

It is from artificial oyster-beds of this kind that Boston is principally supplied with these testacea, and the daily market of New York derives a considerable part of its immense consumption from similar sources. The poles which mark the position of these oyster farms or preserves and the proprietary boundaries on the flats, form conspicuous objects on the approach to Boston and some other maritime cities from the sea. The oysters are dredged up by means of an instrument resembling a large iron rake, drawn behind a boat under full sail or pulled by rowers.

About 150 sail of schooners, of 100 tons, and manned by four or five men, were formerly engaged in transporting oysters from Virginia to the planting-grounds near New York, whence they were brought to the city, in their season, by about 300 market-boats. Many small oysters for summer use are also brought down the North river from near Sing Sing and planted as "seed" oysters in the East river, in Newark bay, and along the Sound, where they are left for two or three years to grow. The Fulton Market, in New York, is always supplied with the choicest oysters to be found, and many local and fancy names are given to them by the retailers. The prices paid for common oysters by the few dealers who control the trade, previous to the war, were $3 to $12 per thousand, and for very fine lots as much as $120 per thousand has been paid. These were so large that 100 of them filled a barrel. They were planted oysters from the head of the Sound near Sand's Point and City Island. Some of the East river oysters, as the "Saddle Rocks," are very large, and at the present time sell for $2 50 to $5 per 100. Various coves and creeks on both sides of Long Island furnish oysters which are named from the localities that produce them. Many of these, especially the smaller ones, are either sent to the west in the shell or put up in cans, pickled or fresh. Many are thus annually prepared on board the oyster scows in the harbor and in regular establishments, particularly at New Haven, Connecticut.

The oyster trade of the United States employs many persons and a considerable amount of tonnage. The census of 1850 returned 177,930 bushels as the product of the oyster trade of Virginia in the preceding year. The total value of the oyster fishery of the Chesapeake bay in 1858 has been estimated as high as $20,000,000, at the rate of one dollar per bushel, which was doubtless an overestimate, both of the amount and average price. The chief inspector of Virginia stated the export of oysters from that State between the first of October, 1858, and the 30th of June, 1859, at 2,301,719 bushels, all of which were taken from the waters of the York river, Rappahannock, Potomac, and Hampton Roads. Large quantities were shipped from other points, of which no account was furnished. The returns of 1860 make the value of oysters taken throughout the Union

to be $1,419,761, which was doubtless below the actual value of this branch of the fishery. Connecticut was by far the most productive of any State in oysters, having returned a value of $610,450, or nearly one-half of the whole. The immense number of bays, sounds, inlets, and lagoons which indent the coast of New Jersey everywhere abound in oysters of the best quality, some of which, as the "Shrewsburys," from the vicinity of Long Branch, are by many esteemed the finest in the market. Great Egg Harbor abounds in fine oysters. The New Jersey oyster trade, in 1860, employed 160 establishments, with 564 hands, and a capital of $186,875. Of these, 107 establishments and 382 hands were returned by Cumberland county alone, of which number only 78 concerns reported the quantities taken. These amounted to 69,440,000, of the value of $214,530. Middlesex county returned 23,500 bushels of oysters, valued at $19,500, or about 83 cents per bushel, and Ocean county 5,000 bushels of market oysters, worth $2,500, and 100,000 planted oysters, valued at $1,200, or about $1 20 per 100. The value of oysters returned by New York was $93,270; by Maryland, $43,825; by Virginia, $139,232; by North Carolina, $2,100; by Texas, $5,553; by California, $77,000, and by Washington Territory, $44,597.

The numerous estuaries, bays, and inlets of the Chesapeake, like those of New Jersey, are very prolific of oysters of the finest description. Those of Norfolk, Virginia, and its vicinity, have long been noted for their excellence. The oysters of Delaware bay are also much esteemed in Philadelphia.

In 1860, Virginia, according to the official returns, had 130 oyster fishing establishments, employing a capital of $96,000, and Maryland, 63 firms having invested $26,925, and employing 198 hands. These figures imperfectly represent the magnitude of this growing trade. St. Mary's county, in Maryland, reported 168,000 bushels of oysters, worth $26,000, or 15½ cents per bushel, as having been caught by 15 oyster vessels, employing 150 hands. The oyster fishery of Virginia has since been almost totally suspended by the war.

The large oyster trade of the Chesapeake centres in Baltimore, which distributes oysters, fresh, canned, and pickled, to every part of the west, and to foreign countries. During the year 1840 there were forwarded from Baltimore to different places, by wagons, in the shell, 170,000 bushels, and after being opened and pickled, 320,000 bushels. These went as far west as Wheeling, Virginia, and the trade, which was then in its infancy, received a great impulse by the opening of the Baltimore and Ohio railroad and its connecting lines. The quantity consumed in the city at that date was estimated at 220,000 bushels, making a total of 710,000 bushels. The commercial statistics of Baltimore, for the year 1860,* give the number of oyster-packing houses in the city as 30, and the number of bushels packed as 3,000,000. Their value, at 35 cents per bushel, was $1,050,000. The number of vessels employed was 500, the number of hands 3,000, and the total value of the trade was $1,800,000. About two-thirds of the oysters taken by the packers are put up in a raw state in ice, and sent to all the cities in the west. The balance is put up and sealed and sent in the same direction. St. Louis is the principal point for distribution throughout the extreme west, even to Nebraska. Besides those which are packed and pickled, large numbers were formerly put up in cans hermetically sealed and sent to California, Australia, and other countries. This trade is less extensive than formerly, oysters being now found abundantly in the waters of the Pacific States. The oyster business of Baltimore employed several hundred vessels, averaging 700 bushels each, and a crew of four men, in bringing them to the city. A large number of these were boats called "pungies," carrying from 200 to 500 bushels each. From 1,500 to 2,000 persons, chiefly negroes of both sexes, were employed in "shucking" or opening the oysters. About 200 white men were engaged in making tin cans, to the value of $400,000 annually, and an equal number in soldering the cans, making boxes, and packing in ice, ready for shipment. Most of the oysters for packing and pickling were brought from the rivers and inlets south of the Patapsco, and some of larger size and finer flavor than the river oysters from Norfolk. Of the 200,000 bushels consumed in the city, about 30,000 bushels were brought by the Norfolk steamers, and averaged 50 cents a bushel.

In 1862 it was estimated that 33 oyster firms in Baltimore packed 1,500,000 bushels of oysters. The gross sales of oysters in the shell were estimated at $700,000. About 700 vessels were employed in catching in the tributaries of the Chesapeake, and about 300 in carrying them to market. The hands employed in these vessels and in catching oysters were computed at 10,000, the shuckers and packers at 1,500, and the tinmen at 200. The value of oysters packed during the year, which was one of more than ordinary success, was estimated at $1,200,000. The tonnage of oyster vessels which passed eastward through the Chesapeake and Delaware canal in 1839 was 11,038 tons, and in 1860 amounted to 16,668 tons. Very good oysters have also been obtained in past years from the vicinity of Charleston, South Carolina, of which the original name, given at its foundation in 1672, was "Oyster Point Town."

Many oysters are taken in the bays and rivers of New England and of other Atlantic States, which are not fully reported. The oyster fishery in Providence river, Rhode Island, was estimated in 1840 to be worth $30,000 per annum, exclusive of the catch of 75 boats employed in Narragansett bay. The Point Judith and Westerly Ponds also furnished, respectively, 500 and 250 tons of oysters. A single oyster-bed in Quinnipiac, or Fair Haven river, in Connecticut, in 1839, was estimated to contain over 30,000 bushels, worth $20,000, and employed 400 boats of all sizes in removing them on "oyster day," on which the law first permits it. The oyster trade of Fair Haven in 1860 included about one million bushels of oysters bought and sold, oysters opened one million gallons, and the manufacture annually of upwards of half a million tin cans and nearly half a million wooden kegs for packing and shipping oysters.

The principal oyster fishery of the Pacific States is in Shoalwater bay, north of the Columbia river, in Oregon, where these shell-fish were originally found imbedded several feet deep, and upon being transplanted were found to be of excellent quality. At San Juan island, in Puget sound, and in other inlets of that coast, oysters are found, and also quahaugs or

* Eleventh Annual Report of Baltimore Board of Trade.

clams, and other shell-fish. These, with salmon, constitute the principal food of the indolent coast tribes of Indians. Many are sent to San Francisco and markets of the Pacific.

CLAMS.

These testacea, though of little value commercially, are of some local importance on many parts of our coasts as an article of food. The early settlers upon our rugged New England shores found them a valuable resource in times of dire extremity. The name of *clam* is applied to several species of bivalvular shell-fish, one of which, the soft clam, the *Mya arenaria* of zoologists, is abundant along our New England seaboard, in New York harbor, and on the European shores of the Atlantic. These are much used along our northern shores as food, and also as bait for cod and haddock. They are found imbedded about one foot below the surface between high and low-water mark, and when dug out are "shucked" or shelled and salted down in barrels for the fisheries. As many as 5,000 barrels have been thus annually prepared and sold in New England at six and seven dollars a barrel.

The hard clam, or *Venus mercenaria*, also inhabits both coasts of the Atlantic. In New England it is known by the name of "quahaug," and in more southern markets is called clam. The pink-colored margin of the inner surface of the shell of the *V. mercenaria* was used by the aborigines in the manufacture of their *wampumpeag* or shell-money. It is the kind of clam most used in New York and other Atlantic cities, the market of the former city being supplied from Long Island sound and the East river. They are not usually dug up from the sand like the soft clam, but are raked up like oysters from water six to twenty feet deep in Oyster bay, Cow bay, Little Neck bay, and other noted oyster fisheries, and from the bays and inlets of the Atlantic coast of New Jersey. The clams from the latter region are inferior to those of the East river, of which the Little Necks are the most celebrated. The clam fishery of New Jersey employs some 25 sloops, of 20 to 30 tons each, which carry from 100,000 to 150,000 clams at a load, and make from six to ten trips yearly. The clams sell at from $2 25 to $3 per thousand in New York, whence they are sent in barrels to all parts of the country. The East river clams bring from $1 to $1 50 per bushel, and employ about 100 hundred boats and 150 to 200 men constantly in catching them. The southern coast of Long Island furnishes clams sufficient to employ some 30 sloops, which carry from 50,000 to 150,000 at each trip, which is made once in two weeks. The New York clam trade is in the hands of the oyster dealers, but that of New Jersey is an independent trade. In addition to those required for daily use, and large quantities shipped inwardly, many are pickled and exported, and the quantity annually brought to New York for these purposes is probably 200,000,000.

THE WHALE FISHERY.

Few industrial occupations of man have elicited more enterprise and daring than the whale fisheries of the world. The profit and the excitement which attend the successful pursuit and capture of marine monsters like the whale, have made it a favorite employment of maritime nations, and have developed the hardy virtues of a class of seamen who are among the most manly and upright of land or seafaring populations. Its devotees have strengthened the commercial and naval marines of the world; its enterprises have encouraged the art of shipbuilding and nursed the spirit of adventure and discovery in untraversed seas, and its products have supplied materials hitherto almost indispensable in the useful arts and for the comforts of domestic life.

The whale has been found in almost every sea, from the Arctic to the southern pole. Of this gigantic mammal there are two principal families, embracing several genera and species. The common black Greenland, or "right" whale, *(Balaena mysticetus,)* is the chief object of pursuit by whalemen. The great-headed cachelot, or great spermaceti whale, *(Physeter macrocephalus,)* is one of the largest and most valuable of the cetacea, and is particularly noted for the great size of its head, which constitutes nearly one-half of the whole animal. The Greenland whale is found in Davis's straits, on the coasts of Greenland, Iceland, Norway, and Labrador, in the Gulf of St. Lawrence, at the Philippine islands, and near Ceylon. Though seldom suffered to attain the great size formerly met with, it sometimes reaches 80 feet in length, its usual size being 50 to 60 feet long and 30 to 40 feet in its greatest circumference, just behind the fins. Its total weight is about 200,000 pounds, or 100 tons. The head constitutes about one-third of its entire length, being 16 to 20 feet long and 10 to 12 feet broad. The broad and toothless jaw extends the whole length of the head. The upper jaw, in place of teeth, is lined by two parallel rows of horny laminæ, laid lengthwise, and fringed by filaments of the same substance, which is the elastic whalebone of commerce, the first mention of which as a commercial article was in 1617, when fins and bone were brought to England from Spitzbergen with oil.* A single whale sometimes yields from 700 to 1,000 such bones, the largest being often 10 to 15 feet in length and 10 to 12 inches in width at the base, and in thickness four to five-tenths of an inch. All the laminæ above six feet in length are called *size* bone, and has been sold in Europe as high as £700 sterling per ton. In 1763 it sold for £500 per ton, but has never reached that price since, varying in the early part of this century from £70 to £150 per ton, sometimes reaching £300. The layer of fat or blubber beneath the skin of this whale is 10 to 20 inches thick, and yields by expression nearly its own weight of train oil. The lips of the whale are almost entirely composed of fat, and yield from one to two tons of pure oil. The total product of a single whale of large size, weighing 70 tons, is often from 6,000 to 7,000 gallons. There are several species of the Balaena.

Of the *Physeter*, cachelot, or spermaceti whale, there are also several species enumerated, but not well determined. These inhabit principally the southern seas, and are found in the Indian ocean, on the coast of New Holland, in the Japanese seas, to the Philippine islands, and eastward as far as California. Being supplied with teeth, the cachelot furnishes no whalebone, but its enormous head supplies crude spermaceti, enclosed in a membranous case of the brain, which, in an ordinary sized

* Anderson's History of Commerce.

whale, will yield about 12 barrels. This oily fluid, after death, congeals into a spongy, granulated mass, from which a superior quality of oil is still drained, and the crude substance, when purified, forms the white, semi-transparent, unctuous, and flaky article so much valued as a material for candles, tapers, &c., under the name of spermaceti. The "blanket," or layer of blubber beneath the skin, from eight to fourteen inches thick, is of yellow color, and when melted down becomes the sperm oil of commerce. These cetaceans are very social and gregarious in their habits, and have often been met with in "schools," or herds, of five or six hundred.

The Norwegians are supposed to have been the first who engaged, in a desultory way, in the capture of whales upon their own coast. They were followed by the Basques and Biscayans, who in the twelfth and two following centuries engaged with some success in the same enterprise. The voyages of Barentz, who, in 1596, discovered Spitzbergen; of Henry Hudson, in 1610, and of others in quest of a northwest passage to India, informed the Dutch and English of the vast numbers of whales to be found in the northern seas. Vessels were at once fitted out by both people for those regions, the harpooners and part of the crews being Biscayans. The English Muscovy Company, of which Sebastian Cabot was the first president, under a royal charter, soon set up exclusive claims to fish around Spitzbergen by right of prior discovery, which led to a parcelling of the adjacent ocean into districts assigned, respectively, to the English, Dutch, Hamburghers, French, Danes, &c. The Dutch soon acquired the ascendency in this fishery, and by the middle of the seventeenth century had built on the northern shore of Spitzbergen, within eleven degrees of the pole, a regular village as a rendezvous for whale ships, supplied with all the apparatus for preparing oil and bone for market, and having well-furnished shops, good inns, and many of the comforts and luxuries of city life. To this place, appropriately called "Smeerenberg," (grease mountain,) provision ships resorted for the supply of the whalers, and transports were yearly sent in ballast to carry home the accumulated product of the fishery. The Dutch whale fishery reached its highest prosperity about the year 1680, when it employed about 200 ships and 14,000 sailors, and drew annually from England about £100,000 sterling for whalebone alone. Like the English whale fishery, that of Holland was at first controlled by an exclusive company, chartered in 1614, and though extensive, was less profitable than it became when thrown open to general competition in 1642. The flourishing fishery at Spitzbergen, however, decayed, like that of the Biscayans, chiefly through the disappearance of the whales from the neighborhood. They retreated first to the open seas and afterward to the coast of Greenland, and having been followed thither, Smeerenberg was deserted, and its site is now scarcely discoverable.

The English whale fishery was unsuccessfully carried on in the northern ocean, first by the Muscovy, and after 1725, with little better success, by the South Sea Company, which, after much loss, abandoned it in eight years. The British government, in 1672, granted a bounty of six shillings sterling per ton on whale oil brought home, and in 1732 allowed to all British and colonial whale ships of 200 tons and upward a bounty of thirty shillings a ton, which, in 1749, was raised to forty shillings, This revived the trade until 1777, when the bounty was reduced to thirty shillings. The number of whaling vessels decreased during the next five years from 105 to 39, but was increased again on the restoration of the bounty in 1781. In 1787 the bounty was again reduced to thirty shillings, in 1792 to twenty-five shillings, and in 1795 to twenty shillings, at which it continued until 1824, when it ceased altogether. The total amount paid in bounties to encourage the whale fishery from 1750 to 1788 was £1,577,935 sterling, and down to 1824 the whole sum paid exceeded £2,500,000 sterling, or $12,500,000. In 1789 the northern whale fishery employed 161 ships, whose tonnage was 46,599 tons. Between that year and 1824 the smallest number in any one year was in 1795, when only 44 ships of 11,748 tons and 1,601 men were engaged in it. Its most flourishing period was about the year 1820, when there were employed 159 ships and 50,546 tons. They captured 1,595 whales, which yielded 18,745 tuns of oil and 946 tons of bone. From that date to 1834 the business fell off about one-half.

The Dutch whalers visited Davis's straits in 1719, and the English some years later. In 1820 the Greenland whale fishery, since nearly abandoned, was the most important. The average number of ships annually engaged in the whale fishery of Greenland and Davis's straits between the years 1815 and 1834 was 115. The average annual tonnage was 37,013 tons; the number of whales annually taken was 1,024, yielding 11,313 tuns of oil and 591 tons of whalebone. On an average, five ships were lost annually. About the year 1820 attempts were made to revive the Dutch whale fishery, and several large companies were formed whose efforts were soon abandoned.

The South sea whale fishery of England was not commenced until about the beginning of the American revolution, long after the American colonists had engaged in it with a vigor and success which elicited the eloquent panegyric of Burke. In each of the first ships from England four American harpooners were sent, as being already skilled in the business. The object of this southern fishery is the capture, not only of the great spermaceti whale, but also the common black whale or small-eyed cachelot of the tropics, *(Physeter microps,)* and of the sea elephant, or southern walrus, the last of which often furnished the entire cargo of oil, known in the market—like that of the black whale, which it closely resembles—as southern oil. In 1791 England sent to the South sea 75 ships, a number never after equalled. In 1820 there were at sea 137 ships, but only 39 returned in that year, and in 1829 only 31 ships were sent out, whose burden was 10,997 tons, and their crews 937 men. The voyages to these seas varied from two to three years. The average number annually at sea during the 35 years from 1800 to 1834, inclusive, was 83. Their tonnage during the first ten years averaged 242 tons each, and the crews 28 men; for the next ten years, 300 tons and 30 men; during the next six years, 340 tons and 32 men; and for the last nine years, 390 tons and 36 men. The average price of sperm oil during that period was about £74 sterling, and of common oil £32 16*s.* per ton.

The British whale fishery in 1821 employed a total of 322 ships and 12,788 seamen, including 36 ships and 792 men in the fur and seal-skin trade. In 1841 there were only 85 ships and 3,008 men so employed, showing a falling off of 237 ships and 9,780 men, or upward of 73 per cent. in 20 years. The importations of Greenland, spermaceti and common oil, in the

former year amounted to 24,676 tuns, and in the latter of only 3,911 tuns—a decrease of 20,765 tuns, only partly compensated by an increase of 9,897 tuns of oil from the British colonial fisheries. In 1844 there were 32 ships fitted out for the northern and 47 for the southern whale fishery. The decline in this branch of British maritime enterprise is attributed in part to the withdrawal of the bounties in 1824, which are supposed to have been a principal inducement. It is also due in no small degree to the use of gas and the substitution of the cheaper vegetable and lard oils, and of stearine from lard, in place of sperm, spermaceti, and common oil. The quantity of vegetable oils imported in 1821 was 16,400 tuns, and in 1841, 47,729 tuns—an increase of 41,729 tuns. There is little doubt that the great risk to life and property incurred, and the very heavy outlay of capital involved in an enterprise eminently precarious and uncertain in its returns, have contributed to the decay of the British whale fishery.

The French, who were the first regular whale fishers, have long since nearly abandoned the enterprise, although about the year 1784 attempts were made to revive it by Louis XVI, who fitted out at Dunkirk, at his own cost, six ships, provided, at much expense, with harpooners and seamen from Nantucket. Their success induced several private adventures in the business, and in 1790 about 40 ships from France were employed in whaling. The revolution, which followed soon after, totally arrested its further growth, and subsequent efforts of the government were unable to revive the trade, which in 1836 employed but 12 or 15 ships.

AMERICAN WHALE FISHERY.

In magnitude and success the New England or American whale fishery has outstripped that of all other nations, and takes rank among the greatest maritime enterprises of the world. Among the earliest recorded observations on North America we find frequent mention of whales along our own shores and at Bermuda and the Bahama isles. They were often stranded upon rocks or in narrow inlets, where they became an easy prey to the aborigines, who in the northern parts of the continent used their oil for food. The natives were also accustomed, before the settlement of the Europeans, to venture out in their frail canoes and attack these marine monsters in their native element, worrying them to death with lances and other instruments attached by long strings to blocks of wood. The bones of the whale were found by English ships bleaching on the shores of Cape Breton in 1521, and as early as April, 1614, Captain John Smith made his first voyage to New England with two ships and several experienced whalemen, principally to catch whales. They found on the coast of Maine many of the species called rorqual, *(Balaena jubartes,)* but were unable to take any, and turned their attention to the cod fishery. In 1624 whales were found dead on the shores of the Bermuda islands. The whale fishery was carried on in the bays of these islands previous to 1667, and soon afterwards from New Providence, in the Bahamas, which became a noted whaling station. Boat-whaling was commenced by the resident white population on several parts of our coasts almost from their first settlement, and in many places has continued to be a permanent industry of the people, who have followed their gigantic game under every sky, from the tropics to either pole.

The people of East Hampton, on the east end of Long Island, appear to have been the first to engage in the capture of small whales upon the flats surrounding the island, which was begun almost from the date of its settlement in 1648. In this business they employed the natives, who, in their deed of the town site to the Connecticut authorities, stipulated that they should have the fins and tails of all whales cast up. The whaling business was there regulated by law, which compelled every white man to take his turn in watching for whales from a look-out upon the beach, and to sound the alarm when he discovered one at sea, and regulated the manufacture of oil-casks in the towns "where the whaling designe is followed."

Towards the end of the reign of Charles II a duty of £2 6*s*. 10½*d*. on each tun of oil and whalebone produced by the northern fishery was repealed, so far as the English whalers were concerned, but was still levied from colonial fishermen. In 1699 an additional tax of about 2½*d*. per pound was laid on all colonial and foreign whalebone imported. It was repealed in 1723 for all but the northern fishery. In 1716 Captain Samuel Mulford, of East Hampton, in a memorial to Parliament on the subject of this duty, stated that whaling had been carried on from that port for sixty years without impost; that in 1686 the town had a patent from the King, which for forty shillings a year granted it the privilege of the fisheries, the only kind followed being the whale fishery. In January, 1721, the capture of twenty whales, with the loss of eleven boats and one man, was reported as the work of the season by Long Island whale fishermen. The business was encouraged by an act of the New York legislature in 1719. The neighboring ports, particularly Sag Harbor, have also been long engaged in the same industry. The latter place in 1839 employed in it 31 ships, of 10,605 tons, and in 1852 had 6,042 tons still engaged in whaling.

As early as 1668 or 1669 a whaling company was organized at New London, Connecticut, to prosecute the business in boats along the shore of the Sound. That port has ever since been a leading one in the whale fishery. The district in 1846 had 80 sail and 2,295 men employed in the whale fishery in every part of the globe, and the port of Stoughton 39 vessels and 1,150 men. The former had about doubled its whaling fleet since 1834, when it employed 41 vessels, 11,251 tons, and 1,081 men in the whole trade. In 1852 New London had 15,961 tons of shipping engaged in whaling, and the receipts were $1,349,872. About the same time, or earlier, the people of Nantucket—encouraged by their success in capturing with a rude harpoon, extemporized for the purpose, a species called "scrag whale," which for several days had been seen spouting and gambolling in their harbor—made a contract in 1672 with one James Lopar to carry on whaling jointly with the town for two years. He was to receive ten acres of land and other privileges; was to bear one-third of the burden, the town bearing the other two-thirds, and retaining a monopoly of the trade. Whoever killed a whale was to pay the town, or the companies authorized by it, five shillings for every such whale. On nearly the same terms a contract was made with James Savage to settle in the town as a cooper. The people of Cape Cod having soon after entered successfully upon the same business, the

Nantucket fishermen in 1690 took systematic measures to extend their infant enterprise. To this end they engaged Ichabod Paddock, a cape fisherman, to teach them the art and mystery of catching whales and of extracting the oil. From that time boat-whaling became a settled pursuit with the inhabitants, who found apt and skilful aids in the Indians, who often acted as steerers and headsmen. The boats sometimes, in clear weather, ventured out of sight of land, and performed many feats of daring. The approach of whales was watched with a spy-glass from the top of a tall spar on the shore; when killed, he was towed ashore and the blubber was cut and heaved off by a sort of capstan called a "crab," and carted to the "try-houses," where it was boiled out and prepared for market. During the first thirty years of this business there was no sensible diminution of whales on the coast, and in 1726 no less than eighty-six were taken near the shore, as many as eleven having been towed to the land in one day. The first spermaceti whale known to the inhabitants was found dead and stranded upon the shore of the island, and was claimed by the Indians, by the white residents, and by the officers of the Crown. The first of this species captured was taken about the year 1712 by Christopher Hussey, who was blown off from shore while cruising for "right whales," the ordinary game of the Nantucket fishermen. This gallant exploit stimulated the enterprise of the fishermen, who soon began to fit out vessels of thirty tons and upwards, equipped for a cruise of six weeks, in which the blubber of each whale caught was brought home and prepared in "try-houses" near the landing, while the vessel went on another cruise. This "deep whaling" marked a new epoch in American whale fishing, and entitles the Nantucket people to the honor of being the first to pursue the ocean traffic in whales from our shores. From that time forward the islanders have been wedded to this dangerous but exciting avocation, and the first dream of youthful ambition has been to harpoon a whale. They became the most expert whalemen in the world.

In 1715 six sloops, of from 30 to 40 tons burden, were engaged in whaling from that port, and produced a return of £1,100 sterling. A larger class of vessels was soon introduced for the sperm whale fishery which then commenced, requiring additional seamen, who were drawn from Cape Cod and the ports westward as far as Long Island. The domestic market soon became overstocked with oil, which was purchased in Boston and thence exported to England or the West Indies. About the year 1745 the people of Nantucket opened a foreign trade by sending a small vessel-load of oil direct to Europe, and thenceforward found their profits in shipping oil and bone to England and the continent, and purchasing return cargoes of needed supplies. About this date vessels of 100 tons and upwards were introduced for the purpose of following the whale into more distant seas. In 1746 they first visited Davis's straits; in 1751 the mouth of Baffin's bay; in 1761 the Gulf of St. Lawrence; in 1763 the coast of Guinea; in 1765 the Azores and eastward of the banks of Newfoundland; and in 1774 the coast of Brazil and the Falkland islands. They also occasionally fished for short periods on the Grand Banks, at the Cape Verd islands, in the West Indies, in the Bay of Mexico, the Caribbean sea, and on the Spanish Main. In 1762 the whale fishery employed 78 vessels, which took 9,440 barrels of oil, and in 1768, 125 vessels, which brought home 15,439 barrels of oil. From 1771 to 1775 the Massachusetts whale fishery employed annually in the northern seas 183 vessels, of 13,820 tons. In the southern fishery there were 121 vessels, of 14,020 tons. These together employed 4,059 seamen, and produced annually 39,390 barrels of spermaceti oil and 8,650 barrels of whale oil. The whole product was valued at £350,000, lawful money, or about $1,160,000. These whaling fleets were fitted out at Nantucket, Dartmouth, Wellfleet, Martha's Vineyard, Boston, Falmouth, Barnstable, Swansea, and Lynn. Nantucket had 65 vessels, of 4,875 tons, in the northern, and 85 sail, of 10,200 tons, in the southern fishery, which employed 2,025 men, and took 26,000 barrels of spermaceti and 4,000 barrels of common oil. Dartmouth had 60 sail in the northern and 20 in the southern fishery. The average price of spermaceti oil a few years before the Revolution was £40, and of head matter, £50 per tun. Common oil sold for about $70 per tun, and whalebone for half a dollar per pound.

This prosperous trade was seriously checked by the restrictive laws of Great Britain which preceded the Revolution, and was nearly annihilated by the war. In both cases partial immunity was granted on petition to the people of Nantucket, some of the most enterprising of whom were induced, on the return of peace, to settle at Dartmouth on the harbor of Halifax, Nova Scotia. There, in 1786, they formed a whaling station, the success of which was, for the time, injurious to the Nantucket whale fishery, which had begun to revive under a State bounty of five pounds per ton for white and three pounds for brown spermaceti oil.

Nantucket, from 1787 to 1789, had 18 vessels in the northern, and the same number in the southern fishery. The whole State had 91 in the former, and 31 in the latter branch; Dartmouth, in Bristol county, being then the leading port, with 45 vessels in the northern, and 5 in the southern trade. Large ships began about that time to be employed, and longer voyages made in quest of the whale. In 1791 the ship Beaver, from Dartmouth, visited the coast of Peru, and was the first American whaleship that doubled Cape Horn. The manufacture of sperm oil, which was commenced in Rhode Island in 1750, was much increased, and supplied large quantities for home consumption and for exportation to the West Indies. In 1796 Nantucket had ten spermaceti works, and the people of the place also made much of their own cordage, sail-duck, casks, blocks and iron-work, being in a prosperous state by reason of their whale trade. In 1810 six or eight ships were fitted out thence for the Pacific ocean. The war which followed, once more prostrated this maritime industry of New England, but the return of peace saw it promptly revive again, and in 1831 there were brought into the two ports of Nantucket and New Bedford alone 76,631 barrels of sperm oil, 84,596 barrels of common oil, and 729,759 pounds of whalebone. The total product of the American whale fishery in that year was $4,046,900. Although Nantucket early acquired and long maintained a pre-eminence in the whale trade, several other ports of Massachusetts and of other States have long and extensively pursued the same lucrative enterprise.

New Bedford, Massachusetts, which is now the principal whaling port of the United States, has been engaged in this trade

since 1764. It has prosecuted the southern or sperm whale fishery with great energy and success. In 1833 it had in that branch 90 vessels, Nantucket having 57, and the whole State 166 vessels. Of 257 American ships absent in the southern whale trade in 1834, New Bedford had 94, and in 1839 this town had 232 ships, barks, &c., employed in whaling. Their united tonnage was 68,835 tons. In June, 1855, New Bedford employed 311 vessels, of 104,690 tons, and entered 1,352,106 gallons of sperm oil, valued at $2,011,257; of whale oil, 5,483,780 gallons, worth $3,214,866, and 1,646,200 pounds of whalebone, valued at $650,249. This business employed a capital of $9,827,100 and 6,775 hands.

Fairhaven, Dartmouth, Salem, Falmouth, Provincetown, Westport, Rochester, and other places have been more or less extensively engaged in the whale fishery.

Newport, Rhode Island, was extensively interested in this industry before the Revolution, and its whaling ventures contributed to the commercial eminence it then enjoyed, when it was the rival of Boston and New York in opulence and trade. In 1769 Newport had 17 sperm oil and candle factories. Providence, Bristol, Warren, and other ports of that State have more recently engaged in the same business. Besides New London, Stonington, Mystic, Greenport, Bridgeport, and other places in Connecticut, have been for some years employed in this lucrative trade.

In addition to East Hampton, Sag Harbor, and other places around Montauk Point, on Long Island, the ports of New York, Poughkeepsie, Hudson, and Newburgh, in the same State, have long prosecuted the whale fishery with success. In 1786, within two years after its first settlement by Rhode Island people, Hudson city had spermaceti works and a covered ropewalk, in aid of its maritime pursuits. In 1833 it had 10 ships and a capital of $200,000 engaged in the whale fishery. A whaling company, with the same amount of capital, was formed at Newburgh in 1831, but was unsuccessful, and dissolved in 1840. The State, in 1833, owned 33 whale ships of over 10,500 tons, which employed about $100,000 and 800 men.

William Penn, and the Free Society of Traders, soon after the first colonization of Pennsylvania by the former, in 1682, established a shore fishery for whales near the mouth of the Delaware. For a number of years it employed many boats and small craft in catching whales on that coast. In 1698 the people of Cape May county, New Jersey, were said to derive large profits from the oil and whalebone of the whales, which they caught in great numbers. There were two spermaceti works in Philadelphia previous to the Revolution. Whaling was also carried on from the shores of Carolina and Georgia in early times.

Several seaports of Maine, New Hampshire, New Jersey, and Delaware have also embarked to some extent in the whale fishery. Seabrook, in New Hampshire, has been noted for the building of whale boats, in which it exceeded every other town of New England. Since the year 1855, when Governor Bigler, in his annual message, called attention to the subject, shore whaling has been carried on from California, particularly in the Bay of Monterey, between the months of March and November. In 1857 one company, employing 15 men, captured 31 whales, 23 of which were killed and yielded 31,926 gallons of oil, valued at $22,500. In 1858 three, and in 1860 four, companies were engaged in this fishery. Considerable quantities of oil are brought to San Francisco from the Sandwich Islands, and thence shipped to other ports.

In tonnage, whale ships vary from 100 to 600 tons, but more generally carry from 200 to 500 tons each. They are usually provisioned for three years, and their outfit is always a large item in the expense. Their loss or failure of success is consequently a heavy drawback. The outfit consists of provisions, such as beef, pork, bread, molasses, peas, beans, corn, potatoes, dried apples, coffee, tea, chocolate, sugar, butter, &c., and of staves and iron hoops for 3,000 to 4,000 white oak casks, spare duck, cordage, and other articles required on the voyage. These amount often to $18,000. The hull frequently costs as much as $22,000, and the total cost sometimes reaches $60,000, the average expense of a ship and outfit being about $35,000. The number of men employed varies from 28 to 42, a ship which mans four boats carrying from 30 to 32. The American system of shipping crews for whale ships is generally by "lays," or pro rata shares of the oil and bone to the officers and men, according to their experience and efficiency. These *lays* are secured by written contracts or articles, in which the captain is usually allowed to draw $\frac{1}{17}$th part of all that is obtained; the first, second, and third officers, respectively, $\frac{1}{28}$th, $\frac{1}{45}$th, and $\frac{1}{60}$th parts; the boat's steersman, $\frac{1}{80}$th to $\frac{1}{120}$th part; and the sailors before the mast, each, $\frac{1}{120}$th to $\frac{1}{150}$th part, according to merit. The voyages average $2\frac{1}{2}$ years—the spermaceti whale ships being absent three years, and right whalers twenty months. Some ships are accompanied by tenders or schooners.

The principal instruments used are the harpoon, the lance, the spade, and the try-pot. Several harpoons have been invented and patented by Americans. The first of these was by James Long, of Maryland, in 1819. The gun-harpoon, invented in 1731, and in 1771 improved by Staghold, and subsequently by Moore, of London, and others, under the patronage of the Society of Arts, which promoted its use in the Greenland fishery at considerable expense, has been laid aside, being found too unmanageable and dangerous for use. The Cumming's whale-gun, invented and used in California, is said to be superior to any implement in use for coast whaling.

Whale oil is extensively employed in manufactures and machine shops. Cotton and woollen factories consume large quantities of sperm oil, each spindle using about half a gallon. The increased importation and consumption of olive oil and of tallow has at times much diminished the profits of the whale trade. From 1825 to 1830 the trade was seriously checked by the low price of oil and whalebone, which was virtually excluded from the English and French markets by heavy discriminating duties, designed to encourage the whale trade of those nations, and amounting in British ports to £26 12*s.* per ton on oil, and £95 per ton on whalebone. More recently the manufacture of lard oil and the discovery of petroleum or oil wells would probably have greatly reduced the price of whale oil and spermaceti, had not the extraordinary increase of American industrial establishments and the foreign demand for these articles maintained the price of all oils at a permanently high figure.

The whole number of vessels from American ports employed in the whale fishery on the 30th of June, 1840, was 498 ships and barks, 34 brigs, 7 schooners, and one sloop—total, 540 sail. The published returns of the national Census of that

year gives only the quantity of spermaceti oil—which was 4,764,708 gallons—separate from the products of other fisheries. A report of the Secretary of the Treasury gave the total tonnage employed in the whale fishery on the 30th of September, 1838, as 124,858 tons. In 1844 this industry employed 504 ships, 140 barks, 33 brigs, and 19 schooners; total 696. The products were, of sperm oil 138,595 barrels, black or whale oil 267,082 barrels, and whalebone 3,015,145 pounds. In 1848, in consequence of losses and the withdrawal of many of the larger vessels from the right whaling fleet, particularly in the Atlantic ocean, the total number of vessels in the whale trade was only 193 ships and barks, and 23 brigs and schooners, or 216 sail, of which 100 were from the district of New Bedford. The product was 107,976 barrels of sperm oil, 280,656 barrels of whale oil, and 2,003,000 pounds of bone—a decrease of 13,000 barrels of sperm oil, 33,000 barrels of whale oil, and upwards of a million pounds of bone, from the importations of the previous year. The average arrivals during the nine years previous were, of sperm oil 141,242 barrels, of whale oil 235,456 barrels, and of bone 2,324,578 pounds. Massachusetts, in 1855, employed in this trade 492 vessels; tonnage, 154,061; capital employed, $14,546,548; number of hands, 11,364. The products were 2,063,809 gallons of sperm oil, valued at $3,059,018; right whale oil, 6,645,864 gallons, worth $3,905,605; whalebone, 2,037,300 pounds, value of same, $802,373. Of the whole number, 388 ships, of 127,542 tons, belonged to New Bedford.

The table shows the total value of the whale fishery in 1860, when its product amounted to $7,749,305—a decrease of ———— from the returns of 1850; since which time there has been a slow but gradual decline in the returns of this fishery. The number of establishments concerned in the trade, and representing the number of vessels employed, was 422, whose united capital was $13,292,060. They employed 12,301 hands, the annual cost of whose labor was $3,509,080, and of raw material—consisting of provisions and other outfits, computed at about 30 per cent. of the entire proceeds—$2,789,195. Of the entire number of vessels, 384 belonged to Massachusetts, 29 to Connecticut, 5 to Rhode Island, and 4 to California.

Massachusetts had invested $12,468,660 in capital, employed 11,296 men, and received as the product $6,734,955. Bristol county alone returned 358 whaling concerns, or vessels, with a capital of $11,534,500; 10,458 hands, and a product of $6,225,285. This was the value of 94,178 barrels of sperm oil, 125,004 barrels of whale oil, and 1,263,872 pounds of whalebone. The greater part of this product was obtained by the whalemen of New Bedford.

Connecticut employed 9 ships, 11 barges, 3 brigs, and 6 schooners, carrying 774 hands, and the proceeds of their voyages—averaging two years each—were 36,200 barrels of whale oil, 445 of sperm oil, and 214,000 pounds of bone, valued altogether at $731,000. The annual cost of labor was $250,380. This product all belonged to the district of New London.

The Rhode Island whale fishery was carried on by 5 vessels, all owned in Bristol county, and carrying 183 hands. The product of their voyages was $246,350, which was the value of 20,550 barrels of whale oil, 1,140 of sperm oil, and 104,000 pounds of whalebone.

The sperm whale fishery of the Pacific coast has been nearly exhausted of late years, but new fields for whaling ships have been found in Hudson's bay and the sea of Ochotsk. In these and other seas there were employed on the 1st of January, 1864, 304 vessels. Their tonnage was 88,785 tons—a decrease of 49 vessels, and of 14,361 tons, since January 1, 1863. The average catch of the northern Atlantic fleet for the season of 1863 was 867 barrels of whale oil, and 12,416 pounds of bone, to each vessel. Seventeen American vessels at Ochotsk averaged only 457 barrels of oil and 5,593 pounds of whalebone to each, which was below the usual catch.

The total imports of 1863 were, of sperm oil 65,055 barrels, of whale oil 62,974 barrels, and of whalebone 488,750 pounds. The average price of sperm oil in 1843 was 63 cents a gallon, in 1863 it was $1 61, and in 1864 $1 92⅞ per gallon. Whale oil in 1831 sold for 30½ cents, in 1863 it averaged 95¼ cents, and now sells for $1 28¼ per gallon. The average price of northern bone in 1841 was 19 cents per pound, in 1863 $1 62, and at the present time $1 82½.

The present high price of oil and whalebone has caused an increase in the number of vessels fitted out during the past year in the ports of New London and Sag Harbor, about sufficient to counterbalance a decrease of 27 vessels and 8,872 tons which, during the year, were withdrawn from ports outside of the district of New Bedford. In that district there was also a decrease of 27 vessels. The total decrease was small compared with that of several previous years. The aggregate tonnage now engaged in this fishery is 79,902 tons. In 1846 it was 230,218 tons.

For the latest statistics on this subject our readers are referred to the following, copied from the "Whaleman's (New Bedford) Shipping List:"

"STATISTICS OF THE WHALE FISHERY FOR 1863.

"The past year, like its several predecessors, has witnessed a large decrease in the number of vessels engaged in the business, and the fleet is now reduced to a number which, although taking into consideration the high price of everything needed in fitting ships, if present prices of the staples continue, can be made a profitable business.

"The success of the Arctic fleet the last season was very good. The number of American ships in the Arctic in 1863 was twenty-six, of which twenty-one arrived at the Sandwich islands, and five at San Francisco,* with an aggregate catch of 28,700 barrels of whale oil and 432,000 pounds of bone—an average of 1,104 barrels of oil and 16,616 pounds of bone to each ship. The favorable news had the effect of infusing new life into our ship-owners, and was the immediate cause of the fitting of eighteen ships, which sailed from this port in the months of November and December last, which otherwise would have remained at our wharves idle all the winter.

"The Ochotsk fleet, which includes seventeen American vessels, have done poorly. Fourteen arrived at the Sandwich islands and two at San Francisco, with an aggregate of 7,310 barrels of whale oil and 89,500 pounds of bone—an average catch of 457 barrels of whale oil and 5,593 pounds of bone. The slim catch in the Ochotsk may be accounted for in the following, which we copy from the Honolulu Commercial Advertiser:

"'We learn that whales have been abundant as usual on the ground, but the weather has been rough and foggy. In addition to this, it is reported that extensive fires have been raging all the summer on the shores of the Ochotsk, which have created dense banks of smoke over the land

* One, the Jireh Perry, of New Bedford, not heard from.

and sea. Some of the forests that line the shores and cover the islands have been entirely swept away. Whether these fires have been set purposely by the Russians or not, is not known. But the effect has been to put a check to whaling in the bays and near the shores, which are the favorite haunts of the whales.'

"The total catch of the two northern fleets of American vessels gives an average season's catch of 857 barrels of whale oil and 12,416 pounds of bone each.

"The new field for Arctic whaling—Hudson's bay—promises well. There arrived at this port from that bay last fall, the Black Eagle, Antelope, and Ansel Gibbs; and at New London, the Monticello and Pioneer; each having been absent two seasons, (spending one winter there,) bringing an aggregate of 5,878 barrels of Polar oil and 98,550 pounds of whalebone—an average of 1,175 barrels of oil and 19,710 pounds of bone to each vessel, by actual turn out. The William Thompson also arrived at this port from Hudson's bay, but as she sailed last year and encountered so much ice in getting through the Straits, there was no time left for whaling. She did not winter, but put away in a very short time for home, to avoid being frozen in. She took 93 barrels of oil and 1,200 pounds of bone.

"Ships must go prepared to winter, in order to have the whole of the following season. There were two arrivals from Cumberland inlet—the Orray Taft, at this port, with 663 barrels of whale oil and 10,150 pounds of bone, and the Georgiana, at New London, with 319 barrels of oil and 4,700 pounds of bone. There were two losses in Hudson's bay in 1863—the Pavilion, of Fairhaven, and the George Henry, of New London—both by being jammed in the ice. The following vessels are to be fitted from this port, for Hudson's bay, the coming spring, viz: Antelope, Ansel Gibbs, Black Eagle, Milwood, Morning Star, and Orray Taft, and probably several from New London.

"The prospect now is that many of the ships in port, and of those to arrive, will be fitted in the course of the year for the various sperm and right whaling localities.

"The sperm whale fishery, which in former years was prosecuted with success on the Pacific coast, seems to have been exhausted of late on those grounds, and ships, with few exceptions, have done little or nothing within the past few years. Short voyages in the Atlantic have been more successful of late, and we doubt if a ship fitted for three years could do better than to cruise in this ocean, visiting the different grounds, according to the seasons.

"Whatever may be the fate of whale ships in 1864, owners have been agreeably disappointed in the extent of depredations committed by the rebel pirates on their vessels in 1863. It was greatly feared by many, in the early part of the year, that these pests of the ocean would be in a position to capture and destroy all, or nearly all, of the homeward-bound whalers coming around Cape Horn. But not a single instance of the capture of a homeward-bound whaler occurred during the year.

"The imports of sperm oil in 1863 exceed those of 1862, 9,414 barrels, while those of whale fall short 37,504 barrels, and of whalebone 274,750 pounds.

"The exports of 1863 fall short of 1862, in sperm oil, 9,610 barrels; whale oil, 57,286 barrels; whalebone, 725,587 pounds.

"The whole number of vessels employed in the business on the 1st of January, 1864, is 304, and of tonnage 88,785, showing a decrease of 49 vessels and 14,361 tons since January 1, 1863.

"The average price of sperm oil for 1863 is $1 61 per gallon; whale oil, 95¼ cents per gallon; whalebone, northern, $1 62, and southern $1 44½ per pound, against $1 41½ for sperm, 59½ cents for whale oil, 88 cents for northern, and 76 cents for southern bone, in 1862.

"The stock of sperm oil on hand January 1, 1864, exceeds that of 1863, 15,162 barrels, while that of whale is less by 13,675 barrels. Whalebone is in excess over 1863 of 57,480 pounds.

"We now refer our readers to the following tables of statistics, which have been prepared with great care, and will be found correct:

Imports from 1855 to 1864.

	Bbls. sp.	Bbls. wh.	Pounds bone.		Bbls. sp.	Bbls. wh.	Pounds bone.
1863	65,055	62,974	488,750	1858	81,941	182,223	1,540,600
1862	55,641	100,478	763,500	1857	78,440	230,941	2,058,900
1861	68,932	133,717	1,038,450	1856	80,941	197,890	2,590,700
1860	73,708	140,005	1,337,650	1855	72,649	184,015	2,707,500
1859	91,408	190,411	1,923,850				

Exports of sperm oil, whale oil, and whalebone from the United States.

	Bbls. sp.	Bbls. wh.	Pounds bone.		Bbls. sp.	Bbls. wh.	Pounds bone.
1863	18,366	11,297	279,394	1860	32,792	13,007	911,226
1862	27,976	68,583	1,004,981	1859	52,207	8,179	1,707,929
1861	37,547	49,969	1,145,013				

Importations of sperm oil, whale oil, and whalebone into the United States in 1863.

	Barrels sperm.	Barrels whale.	Pounds bone.
New Bedford	42,408	43,191	307,950
Fairhaven	3,356	1,137	7,800
Westport	3,874	195	------
Mattapoisett	1,573	7	------
Sippican	308	26	------
District of New Bedford	51,569	44,556	315,750
New London	23	2,148	35,550
Nantucket	3,823	557	4,950
Edgartown	1,170	100	900
Provincetown	1,290	1,730	------
Boston	4,916	5,637	88,900
Beverly	210	------	------
Salem	200	40	------
Sag Harbor	885	855	5,100
New York	969	7,351	37,600
Total	65,055	62,974	488,750

Statement of stock of oils and whalebone in the United States January 1, 1864.

	Barrels sperm.	Barrels whale.	Pounds bone
New Bedford	24,880	8,314	26,200
Fairhaven	1,800	.....	.....
Westport	2,700	.....	.....
Edgartown	500	.....	.....
Nantucket	760	.....	.....
Boston	315	410	.....
Salem	220	.....	.....
New London	25	15	.....
New York	.....	605	122,780
Total	31,200	9,344	148,980

Stock of oil and bone on hand on the first of January in the last seven years.

	Bbls. sp.	Bbls. wh.	Pounds bone.		Bbls. sp.	Bbls. wh.	Pounds bone.
1864	31,200	9,344	148,980	1860	13,429	96,480	380,600
1863	16,038	23,019	91,500	1859	17,176	82,376	400,000
1862	16,132	58,378	295,600	1858	39,307	91,193	235,500
1861	15,838	80,469	418,700				

Average prices of oil and bone.

	Sperm.	Whale.	Bone.		Sperm.	Whale.	Bone.
1863	$1 61	$0 95¼	$1 53	1858	$1 21	$0 54	$0 92½
1862	1 42½	59⅛	82	1857	1 28⅛	73¼	96¾
1861	1 31¼	44¼	66	1856	1 62	79½	58
1860	1 41½	49½	80⅛	1855	1 77-2/10	71-8/10	45¼
1859	1 36¼	48½	.....				

Number of ships engaged in the north Pacific fishery for the last five years, and the average quantity of oil taken.

1859	176 ships averaged 535 barrels	94,160	barrels.
1860	121 ships averaged 518 barrels	62,678	barrels.
1861	76 ships averaged 724 barrels	55,024	barrels.
1862	32 ships averaged 610 barrels	19,525	barrels.
1863	42 ships averaged 857 barrels	36,010	barrels.

RECAPITULATIVE TABLE.

Vessels employed in the whale fishery January 1, 1864.

	Ships & barks.	Brigs.	Schrs.	Tonnage.
New Bedford	195	1	1	64,815
Fairhaven	7	..	2	2,389
Westport	11	..	..	2,715
Dartmouth	4	..	..	1,141
Mattapoisett	3	..	..	638
Sippican	..	..	3	301
District of New Bedford	220	1	6	71,999
Falmouth	1	..	..	355
Holmes' Hole	1	..	..	267
Edgartown	6	..	1	2,383
Nantucket	9	..	1	3,173
Provincetown	2	..	23	2,989
Boston	1	..	2	535
Beverly	..	1	1	238
Salem	..	1	..	159
Warren	2	..	..	618
New London	10	2	7	4,571
Sag Harbor	6	..	..	1,528
Total January 1, 1864	258	5	41	88,785

Showing a diminution of 43 ships and barks, 5 brigs, and 1 schooner, and of tonnage 14,361.

Statistics of Fisheries in the year ending June 1, 1860.

WHALE.

STATES.	No. of establishments.	Capital invested.	Cost of raw material.	NO. OF HANDS EMPLOYED.		Annual cost of labor.	Annual value of product.
				Males	Females.		
Massachusetts	384	$12,468,660	$2,282,000	11,296	.....	$3,188,848	$6,734,955
Rhode Island	5	211,000	150,195	183	.....	55,452	246,350
Connecticut	29	605,000	349,000	774	.....	250,380	731,000
California	4	7,400	8,000	48	.....	14,400	37,000
Total	422	13,292,060	2,789,195	12,301	.....	3,509,080	7,749,305

COD, MACKEREL, HERRING, SALMON, WHITE FISH, ETC.

Maine	350	$687,001	$288,345	3,588	7	$368,625	$1,008,689
New Hampshire	14	48,000	20,020	245	.....	24,336	64,500
Massachusetts	169	2,520,000	452,778	7,622	20	1,220,439	2,637,604
Rhode Island	12	34,600	8,950	44	.....	31,692	62,400
Connecticut	145	254,685	61,409	690	.....	143,516	288,589
Total in New England States	690	3,544,286	831,502	12,189	27	1,788,608	4,061,782
New York	39	29,150	4,596	217	.....	38,934	57,770
New Jersey	32	22,920	5,600	187	.....	19,113	38,755
Pennsylvania	6	4,800	240	12	.....	3,096	7,399
Delaware	1	1,000	.....	5	.....	500	515
Maryland	19	37,200	16,027	171	4	14,050	69,180
Total in Middle States	97	95,070	26,463	592	4	75,693	173,619
Ohio	6	5,400	3,000	21	.....	5,040	10,600
Indiana	3	2,775	1,188	50	.....	9,000	22,500
Michigan	186	209,769	87,628	29	63	117,776	456,117
Wisconsin	52	75,975	55,103	210	.....	19,359	93,374
Iowa	1	400	125	4	.....	720	1,000
Total in Western States	248	294,319	147,044	1,214	63	151,895	583,591
Virginia	28	33,990	19,824	567	4	25,754	68,210
North Carolina	32	67,312	18,525	698	134	23,620	117,259
Florida	10	47,500	2,750	176	.....	33,600	68,952
Alabama	2	1,550	500	8	.....	1,440	1,350
Total in Southern States	72	150,352	41,599	1,449	138	84,414	255,771
California	7	17,500	7,336	70	.....	9,240	18,940
Oregon	2	14,720	3,716	12	.....	8,016	13,450
Washington Territory	5	13,200	3,250	53	.....	3,975	17,450
Total in Pacific States	14	45,420	14,302	135	.....	21,231	49,840
Total in the United States	1,121	4,129,447	1,060,910	15,579	232	2,121,841	5,124,603

OYSTERS.

STATES.	No. of establishments.	Capital invested.	Cost of raw material.	NO. OF HANDS EMPLOYED.		Annual cost of labor.	Annual value of product.
				Males.	Females.		
Connecticut	23	$115,550	$368,880	147	*696	$141,780	$610,450
New York	43	45,250	12,780	106	.....	27,744	92,270
New Jersey	160	186,875	6,600	564	.....	158,532	394,470
Maryland	63	26,925	4,000	198	.....	27,500	43,825
Virginia	130	96,002	46,390	439	.....	56,940	139,232
North Carolina	1	500	500	3	.....	900	2,100
Texas	4	2,150	2,100	6	3	2,580	5,553
California	2	7,000	11,000	9	.....	3,780	77,000
Washington Territory	1	18,000	.....	100	.....	27,000	44,597
Total in the United States	427	498,252	452,250	1,572	699	446,656	1,410,497
Aggregate of all the fisheries	1,970	17,919,759	4,302,355	29,452	931	6,077,577	14,284,405

*Part of these oysters were "canned," hence the employment of females.